



Symposium on Science & Stewardship to Protect & Sustain Wilderness Values: Session Abstracts

Special Session on protecting and restoring socio-ecological systems in the Eastern Himalayas: Manas National Park, a UNESCO World Heritage Site on the border between India and Bhutan. Part 1. A Difficult History

Names and affiliations: Trishita Shandilya, PG student, Studying Masters in Sociology from Delhi School of Economics, University of Delhi

Title of presentation/panel/round table discussion: “Women’s perspectives on wilderness and protected areas and struggle to identify their own space in wilderness” Some observations from neighborhood village of Manas National Park of Assam, India

Format: Oral presentation

ABSTRACT: Women of ecosystem-based traditional societies are usually deprived of their choice and priorities when an ecosystem is pulled into a new policy regime. This study focuses on understanding the values and perceptions that women of fringe villages carry towards a National Park and how their life is influenced by the park. In a patriarchal social structure, women are ascribed to be the nurturer of the family, and in the ecosystem based traditional social milieu, this ascribed role brings the woman folks closer to nature. Collecting vegetables, herbs, fetching water, engaging in developing kitchen/homestead garden, etc. facilitates a constant interaction with nature for women. These interactions create a multifaceted relation of dependency between nature and humans, specifically between woman and nature. This presentation carries the everydayness of women's life living in the fringe area of a National Park and their intimacy with the forest emotionally, socially and economically. Women's regular journey to the forest does not suffice only the material needs, but acts as an emotional support system in their lives. The journey to the forest brings a break from their usual monotonous routines and gives the scope to escape from their ascribed social positioning and discover the self by enjoying the wilderness. In visiting the forest as an all women group, the space acts as the backstage where women share their sufferings and life events while engaging into the performance of ascribed roles in the front stage that is in village social milieu. Thereby, for women in fringe villages, the forest is the space for them to share experiences of being in a hegemonic patriarchal milieu.

Names and affiliations: Alolika Sinha Aaranyak (Beltola Tiniali, Guwahati, Assam, India), Dr. Bibhuti P. Lahkar (Beltola Tiniali, Guwahati, Assam, India)

Title of presentation/panel/round table discussion: Hog deer never hogged the limelight: understanding the drivers of population density in the Terai grasslands to inform conservation management

Format: Oral presentation

ABSTRACT: Hog deer (*Axis porcinus*) is an endangered cervid that underwent a range-wide decline, largely unnoticed. Assam, in northeast India is one of the strongholds of hog deer population in South Asia. Nonetheless, it is also one of the least focused on mammals of the region and its effective conservation strategies hinge on understanding of ecological and anthropogenic correlates. We therefore assessed the current status of hog deer in Assam and investigated the influence of different factors on hog deer population density in one of the high conservation value landscapes- Manas National Park. Manas had an abundant hog deer population prior to armed conflict, but the conflict resulted in a depressed hog deer population. With the cessation of the conflict, conservation measures are implemented, but mostly directed towards the charismatic species. This led to paucity of information on hog deer and its conservation needs remain unaddressed. As precise information on population density and identification of the factors that influence it is crucial to implementing any conservation action; we estimated hog deer density using distance sampling techniques. We used generalised linear modelling technique to test the effect of various habitat and anthropogenic variables. The estimated hog deer density is $18.22 \pm 3.32 \text{ km}^{-2}$. Imperata grass and fire occurrence have significant positive affect on hog deer population density, whereas, it is negatively affected by the abundance of invasive plants and Mikania, and human presence. Our results suggest that proper habitat management is of utmost necessity to ensure hog deer conservation. Furthermore, protected areas are crucial for hog deer conservation in the region.

Names and affiliations: Sarlongjon Teron (Karbi NRM project, Aaranyak, Assam), Manoshi Goswami (MTCP, Manas Landscape, Aaranyak, Assam), Bipul Das (MTCP, Manas Landscape, Aaranyak, Assam), Silash Basumatary (MTCP, Manas Landscape, Aaranyak, Assam), Jayanta Kumar Sarma (Natural Resource Management and Livelihood, Aaranyak, Guwahati, Assam), Bibhuti Prasad Lahkar (Manas Landscape, Aaranyak, Guwahati, Assam), Mohammad Firoz Ahmed (Aaranyak, Guwahati, Assam)

Title of presentation/panel/round table discussion: 'Journey for Learning'- A Community Based Eco-cultural Tourism Model for Sustainable Livelihoods for Forest Dependent Communities

Format: Oral presentation

ABSTRACT: Journey for learning' (JFL) is a self-initiated eco-cultural tourism endeavor by two different indigenous communities of Assam, viz. Karbi and Bodo. The JFL by Karbi community is centered around the Kohora River Basin in the Kaziranga-Karbi Anglong Landscape while that of Bodo community is centered around the Manas National Park in the Indo-Bhutan landscape. Ethnopolitical and armed conflicts for decades on both the sites has led to a poor economy and stressed livelihoods while government livelihood schemes barely touched them. The concept of JFL was developed with local people's perception of tourism in the area. In both cases, the communities have been deprived of the famous tourism economy of Kaziranga and Manas. The JFL package was developed with learning modules introducing Bio-culturalism and traditional ecological knowledge of communities. It primarily targets postgraduate students and youth around the globe. Following the first experience, the confidence of the hosts increased due to the economic and social benefit gathered from visitors in the form of learning a new language, customs and cultural systems of different guests. The experiences helped in realizing the importance and value of their own culture and social ethos that sensitized their consciences to conserve cultural systems linked to local wilderness and ecosystems. This paper shares the processes and operational modalities of JFL, reflects on the principles of community-based eco-cultural tourism, its impact on people's economic benefits, livelihood security and on ecosystem restoration through values linked to their socio-cultural practices.

Names and affiliations: Bibhuti Prasad Lahkar (Aaranyak), Alolika Sinha (Aaranyak), Anukul Nath (UNESCO C2C - Asia and Pacific Region, Wildlife Institute of India)

Title of presentation/panel/round table discussion: Monitoring and control of invasive plant species in grassland ecosystems of Manas World Heritage Site

Format: Oral presentation

Abstract: Invasive plant species have a devastating impact on sustaining the natural ecosystem for conservation of threatened species. We investigated the distribution pattern of *Chromolaena odorata* and *Mikania micrantha* and factors governing their spread in grassland of Manas World Heritage Site. We carried out extensive field sampling and model the distribution of invasives using a suite of algorithms. Model predictions differed with respect to AUC, sensitivity, specificity and TSS range largely in classification performance. Final risk maps were produced averaging the scores of RF and MaxEnt for both species. Proximity to road and human settlement, elevation, fire occurrence and precipitation of driest quarter were the key predictors for both invasives. Since the present probable areas in which invasives are likely to invade indicates that the majority of significant wildlife habitats will be affected and altered in the near future, invasion risk maps can be used as an early detection tool for the management of invasive species, which could help in minimizing the ecological significance and economic cost of invasions. To control the spread of invasives, experimental plots with three different treatments- uprooting of invasive, cutting of invasive and cutting and burning of invasive were set up in the grasslands of Manas. The manual uprooting of invasive was identified as the best method of control. We established a surveillance system and helped in reporting the occurrence of *Mimosa* spp. for the first time in Manas.

Special Session on protecting and restoring socio-ecological systems in the Eastern Himalayas: Manas National Park, a UNESCO World Heritage Site on the border between India and Bhutan. Part 2. The Future

Names and affiliations: Dr. Dipankar Lahkar (Tiger Research and Conservation Division, Aaranyak, Assam, India), Dr. M Firoz Ahmed (Tiger Research and Conservation Division, Aaranyak, Assam, India), Dr. Ramie H. Begum (Life Science and Bioinformatics, Assam University - Diphu Campus, Assam India), Dr. Abishek Harihar (Panthera, New York, USA)

Title of presentation/panel/round table discussion: Tiger recovery in the aftermath of ethno-political conflict in Manas, India

Format: Oral presentation

ABSTRACT: Manas National Park (MNP) situated in the eastern-Himalayan-biodiversity hotspot experienced armed ethno-political conflict in the late 1980s until 2003. The conflict adversely impacted the wildlife, including the local extinction of Indian Rhinoceros (*Rhinoceros unicornis*). Continued vulnerability of mammalian prey and predators to conflict was further highlighted through our study that showed that the density of mammalian assemblage were significantly lower in Panbari (conflict until 2016) than Bansbari-Bhuyanpara (conflict-free since 2003). Following the cessation of conflict, conservation measures such as reintroduction of Rhinoceros, supplementation of swamp deer and transboundary initiatives to recover tigers and other species with Bhutan were initiated. Here, we evaluate the population status of tigers and their prey through a long-term monitoring program established since 2011 in Bansbari-Bhuyanpara ranges of the park spanning ~250 km². Although the estimated prey density was ~40 individual ungulates/km², we show how current human disturbances in the park affect spatial and temporal behavioral patterns of several ungulates. Nevertheless, tiger density increased from 0.9 to 3.74/100km², representing a 4% annual rate of increase. These results supported by evidence of breeding females, cubs and dispersal of cubs along with the prey density which has been increased to 40 individuals/sq.km shows that the population is slowly recovering. This recovery assumes global significance as MNP is embedded within one of the largest Tiger Conservation Landscapes range wide that spans north-eastern India, Bhutan and Myanmar.

Names and affiliations: Bipul Das (Aaranyak), Silash Basumatary (Aaranyak), Manoshi Goswami (Aaranyak), Jayanta Kumar Sarma (Aaranyak), Bibhuti P Lahkar (Aaranyak), M. Firoz Ahmed (Aaranyak)

Title of presentation/panel/round table discussion: Prospective Good Practices for Reducing Forest Dependency in Fringe Area Communities: A Case Study in Manas Landscape

Format: Oral presentation

ABSTRACT: Forest fringe communities are laden with myriad difficulties due to many factors related to geographic, socio-economic conditions and are thus highly dependent on natural resource bases offered by the forest ecosystems in their vicinity for their livelihood. Increasing population as well as changing perspectives of lives and lifestyles have contributed towards enhanced anthropogenic pressures in the forest areas leading to degradation of pristine forest ecosystems, thereby creating the need for alternative livelihood opportunities for such fringe communities. Further, changing legal domains of protecting the natural forest ecosystems have also restricted access of the communities to the forest resources, which means there should be one or the other forms of livelihood support systems for such communities. However, generation of alternative livelihood systems, which can contribute towards conservation of forest ecosystems as well as secure lives of forest fringe dwellers have many challenges. The current paper aims to present some of the opportunities and practices which can significantly contribute towards reducing the dependency of forest fringe communities based on some case studies from the fringe areas of Manas National Park where interventions were taken up under the Manas Tiger Conservation Programme. This study will analyze how systematic consideration of traditional skills, community mobilization and gender inclusive practices for livelihood development under an approach of conservation livelihood can help in significantly reducing the dependency of forest fringe dwellers on national park areas.

Names and affiliations: Rathin Barman, Bhaskar Choudhury, Panjit Basumatari, Samshul Ali, Abhishek Narayanan, NVK Ashraf, V Menon (Wildlife Trust of India)

Title of presentation/panel/round table discussion: Role of wildlife rehabilitation in rewilding threatened landscapes: A case study of one rhinoceros in Manas National Park, Assam

Format: Oral presentation

ABSTRACT: Manas is a World Heritage Site, a biosphere reserve, a national park and a tiger reserve in Assam, India. Located in the foothills of eastern Himalayan global biodiversity hotspot, this landscape is one of the rich biodiversity areas in the Indian subcontinent. In the late 1980s, this landscape passed through a period of civil unrest that led to the decimation of large mammals like rhinos from Manas due to poaching. Unfortunate developments led to the placement of Manas National Park in the “World Heritage Site in Danger” category by UNESCO. A peace agreement signed in 2003 following a political solution laid the foundation for recovery of the park. Of the number of programmes commissioned to rewild the landscape back to its original status, reintroduction of rhinos using orphan one-horned rhinos was one. So far eighteen rhino calves displaced due to various reasons including floods in Kaziranga National park, have been rehabilitated in Manas over the last 15 years. This programme was followed by several other initiatives to repopulate this landscape with large mammals. Because of this wildlife reintroduction and augmentation and improvement in protection level, after about two decades UNESCO removed the “in danger” tag in 2011. Assam has set an example in wildlife conservation for the entire World to follow. This was achieved through meticulous planning and work with civil society groups and the communities around the landscape.

Names and affiliations: Saurav Malhotra, Joanna Dawson, Prabir Banerjea, Ranjit Barthakur (Balipara Foundation, Assam, India)

Title of presentation/panel/round table discussion: Rural Futures for Forests & Communities in the Eastern Himalayas

Format: Oral presentation

ABSTRACT: Rural Futures entails holistic community development and the creation of Rural Ecosystems through optimisation of Natural Capital & Assets. Central to Rural Futures is the restoration and management of Wild Habitats across the Eastern Himalayas, which, in turn, strengthens the 'Natural Capital' pool of the region. Further to this, the promotion of Ecosystem-based services generates alternative sources of livelihoods in these areas. These depend on the availability of thriving forests and promote the concepts of sustainable forestry and habitat expansion through mindful use of bamboo, cane, timber & wild food. Part I of this project focuses on using funds for Socio-Economic & Environmental impact to mobilise a community workforce dedicated to restoring degraded habitats through scientific afforestation. This initial economic impetus through the first in a series of ecosystem-related services generates upward socio-economic mobility and attracts a downstream value chain enhancing social infrastructure services such as healthcare & education. Part II of this project would be the extension towards creating a model scenario for the rural Eastern Himalayas, in which, ecosystem generated services provide revenue and this in combination with enhanced usage of impact funds, we envision to create socially and economically uplifted Rural Futures. The concepts of RuFu serve as a benchmark for Multifaceted Community Development and Natural Capital creation through optimisation of our rich Natural Assets and delivery of Universal Basic Assets.

Panel: Rethinking Wilderness and the Wild: Conflict, Conservation and Co-existence

Names and affiliations: Robyn Bartel (University of New England, Australia) | From Wilderness Preservation to the Fight for Lawlands. - Freya Mathews (La Trobe University, Australia) | Wilderness narratives. - Stephen Harris (University of New England, Australia), Fiona Utley (University of New England, Australia) | Back from the Wilderness: Caring for wild country. - Robyn Bartel (University of New England, Australia) | What are we fighting for? Evolving values of wilderness in the Age of Extinction. - Vanessa Bible (University of New England, Australia), Tanya Howard (University of New England, Australia) | Exploring wilderness in Iceland - charting meaningful encounters with uninhabited lands. - Thorvardur Arnason (University of Iceland) | Commentary on Panel session on Rethinking Wilderness and the Wild: Conflict, Conservation and Co-existence. - Brendan Mackey (Griffith University, Australia)

Panel session on Rethinking Wilderness and the Wild: Conflict, Conservation and Co-existence

Title of presentation/panel/round table discussion: Back from the Wilderness: Caring for wild country

Format: Oral presentation

ABSTRACT: This paper explores the idea of ‘wild country’ as being country that is uncared for, that has been degraded and neglected and has been unable to be cared for by its Australian Aboriginal custodians (Rose, 1988). The concept is used to unsettle the human-nature binary underpinning the dominant ideal of human-free wilderness and as a lens for an empirical case study exploring other potential attitudinal barriers to promoting human involvement in place-care activities. Previous research suggests that place attachment and landscape preference may be place-protective and may therefore also impede place-care behaviours which seek to change place by ameliorating past impacts and improving environmental conditions. The results of this study conducted in the New England region of Australia demonstrate that even in highly modified areas, in which endemic biodiversity has been degraded and replacement land uses valorized, place attachment and landscape preference may be supportive rather than a hindrance to place-care behaviours. The presentation concludes that greater attention and appreciation of human attitudes and behaviours, alongside systemic de-binarization of human and nature, including decolonization, may provide an approach to wilderness protection preferable to drawing the divide between human and nature wider and deeper still.

Names and affiliations: Freya Mathews (La Trobe University, Australia)

Paper for panel session on Rethinking Wilderness and the Wild: Conflict, Conservation and Co-existence
Organizer contact Robyn Bartel

Title of presentation/panel/round table discussion: From Wilderness Preservation to the Fight for Lawlands

Format: Oral presentation

ABSTRACT: The idea of wilderness preservation was a key inspiration for the upsurge of environmental activism in Australia and elsewhere in the 1970's. Widespread and passionate commitment to this idea resulted in a large expansion of the public conservation estate then and in following decades. However, beginning in the 1980's, the concept of wilderness began to be critiqued from a variety of perspectives, including Indigenous, post-colonial, feminist, ecological (and latterly, ecomodernist) ones. As the critiques were powerful, wilderness as a trope quickly slipped out of conservation rhetoric to be replaced by a scientific rhetoric of biodiversity conservation. This rather unremarked shift in key conservation categories has however entrained a shift in the motivational foundations for conservation, from the moral and often spiritual convictions of the wilderness movement to the more detached and rationalistic scientism of biodiversity policy. It is arguable that this has not only occasioned a loss of momentum in the conservation project in Australia and elsewhere but has also partly stymied the depth of feeling that environmental activists brought to the conservation cause. Many of the later critiques of the category of wilderness homed in on this dimension of inwardness, and disparaged it as anthropocentrism. Defenders of wilderness were seen as seeking to preserve nature only for the sake of its psychological, aesthetic, therapeutic, spiritual or even recreational utility for (some, often privileged) humans rather than for the sake of ecosystems themselves. The way wilderness discourse has been formulated since the 19th century has indeed exposed it to this critique: it has not historically been formulated in terms that were sufficiently ecologically literate or politically sensitive.

Names and affiliations: Stephen Harris, Fiona Utley (University of New England, Australia)

Paper for panel session on Rethinking Wilderness and the Wild: Conflict, Conservation and Co-existence
Organizer Robyn Bartel

Title of presentation/panel/round table discussion: Wilderness narratives

Format: Oral presentation

ABSTRACT: The significance of wilderness to human condition is reflected in the long history of wilderness as a trope in literature. From powerful biblical conceptions of wilderness as realm of spiritual and human destitution, of banishment and exile, and of abyssal 'otherworlds' beyond the locus of the sacred and civilised, through Romantic beliefs about the benevolent forces and elemental powers inherent in nature (as analogue to Romanticist ideas about the vital forces of the creative imagination), through, in turn, to contemporary ideas of the 'wild' influenced by conservationist and environmentally informed convictions centring on the value of wilderness in regard to biodiversity, the concept of wilderness holds a distinctly moral and culturally complex value that has the power to impact social and political agendas. Australian depictions of wilderness fall between the American and English-European perceptions, with contemporary understandings emphasising that, as Tim Winton says, "nature is not done with us yet". The presenters critically gauge the ways that we are "not done" in terms of how we understand the personal and social obligations that flow from belonging to and being dependent on the natural world – where wilderness is understood as beyond the scope of human control; and where the 'wild' delineates both borderlands ('edgelands') where humans can renegotiate ideas concerning nature, but also as such liminal zones themselves offer up political potential in the sense of challenging entrenched ideas about social order and human relations.

Names and affiliations: Robyn Bartel (University of New England, Australia)

Panel session on Rethinking Wilderness and the Wild: Conflict, Conservation and Co-existence

Title of presentation/panel/round table discussion: Back from the Wilderness: Caring for wild country

Format: Oral presentation

ABSTRACT: This paper explores the idea of 'wild country' as being country that is uncared for, that has been degraded and neglected and has been unable to be cared for by its Australian Aboriginal custodians (Rose, 1988). The concept is used to unsettle the human-nature binary underpinning the dominant ideal of human-free wilderness and as a lens for an empirical case study exploring other potential attitudinal barriers to promoting human involvement in place-care activities. Previous research suggests that place attachment and landscape preference may be place-protective and may therefore also impede place-care behaviours which seek to change place by ameliorating past impacts and improving environmental conditions. The results of this study conducted in the New England region of Australia demonstrate that even in highly modified areas, in which endemic biodiversity has been degraded and replacement land uses valorized, place attachment and landscape preference may be supportive rather than a hindrance to place-care behaviours. The presentation concludes that greater attention and appreciation of human attitudes and behaviours, alongside systemic de-binarization of human and nature, including decolonization, may provide an approach to wilderness protection preferable to drawing the divide between human and nature wider and deeper still.

Names and affiliations: Vanessa Bible, Tanya Howard (University of New England, Australia)

Paper for panel session on Rethinking Wilderness and the Wild: Conflict, Conservation and Co-existence
Organizer contact Robyn Bartel

Title of presentation/panel/round table discussion: What are we fighting for? Evolving values of wilderness in the Age of Extinction

Format: Oral presentation

ABSTRACT: In the era of the Anthropocene, faced as we are by unprecedented global environmental challenges and change, the word 'wilderness' can no longer be used without an interrogation of all that it implies, and all that it is trying to describe. This presentation investigates the notion of wilderness through an environmental humanities lens, querying whether notions of wilderness are still relevant, and how these ideas may influence and inform environmental protection legislation. While the notion of wilderness as a landscape that is 'pristine' and 'untouched' is a hallmark of contemporary environmental politics, human activities and resource exploitation routinely undermine these values.

The concept of wilderness has changed and evolved, encompassing both negative associations of wild and dangerous spaces far from human 'civilization', and positive connotations of 'natural' landscapes, untainted by evidence of human habitation. The tension between these different versions illustrates that ideas of wilderness are essentially subjective, and tethered to individual and collective social, economic and political values. Both versions describe a landscape devoid of human habitation, creating a conceptual divide between the natural world and human society that is no longer viable in the modern era.

Inspired by the provocation that concepts of wilderness and the Anthropocene are contradictory in an era in which no part of the globe has been left untouched by human influence, this presentation asks: what does the 'Wild Place' of the Anthropocene look like?

Names and affiliations: Thorvardur Arnason (University of Iceland)

Paper for panel session on Rethinking Wilderness and the Wild: Conflict, Conservation and Co-existence
Organizer contact Robyn Bartel

Title: Exploring wilderness in Iceland – charting meaningful encounters with uninhabited lands

Format: Oral presentation

Names and affiliations: Brendan Mackey (Professor and Director of the Climate Change Program at Griffith University)

Paper for panel session on Rethinking Wilderness and the Wild: Conflict, Conservation and Co-existence
Organizer contact Robyn Bartel

Title of presentation/panel/round table discussion: Commentary on Panel session on Rethinking Wilderness and the Wild: Conflict, Conservation and Co-existence

Format: Oral presentation

ABSTRACT: Professor Brendan Mackey will provide a reflection and commentary at the conclusion of the presentation of the five papers which have just been submitted as part of the panel session on Rethinking Wilderness and the Wild: Conflict, Conservation and Co-existence.

Bio: Brendan Mackey is Professor and Director of the Climate Change Program at Griffith University, Queensland Australia. Brendan has a PhD in plant ecology from the Australian National University. He is a coordinating lead chapter author for the IPCC 6th Assessment report and has published over 200 academic texts in the fields of environmental science, policy and ethics.

Visions for Wilderness: A View for Earth

Names and affiliations: Louis G. Herman, University of Hawaii, West Oahu, US

Title of presentation/panel/round table discussion: REWILDING COSMOLOGY: Completing the evolutionary leap of Homo sapiens sapiens.

Format: Oral presentation

ABSTRACT: How can we mobilize humanity to mitigate catastrophe and preserve at least half of all nature as wilderness? We need a more life-loving story to restore our relationship to wild nature. Our industrial-urban way of life was built on a 17th century cosmology which assumed human beings to be selfish, aggressive and endlessly competitive, separated from, and at odds with the natural world; a world where “wilderness,” in the words of the great philosopher John Locke, is simply “waste,” without “value or meaning” until transformed by human labor into private property. Fortunately, a new, more compelling cosmology is waiting in the wings. This radical evolutionary story is unprecedented in its inclusiveness and persuasive power, integrating science with the accumulated wisdom of indigenous and classical civilizations. The new story presents wild nature as many indigenous societies experienced it—the ultimate source of value, meaning and beauty—literally our creator. It inspires us once again, to fall in love with the great wild earth. This evolutionary cosmology also cuts to the core of what it means to be human. It illuminates an ancient model for truth-seeking which has been hidden in plain sight, deep in the evolutionary DNA of self-reflective consciousness. The truth quest is composed of four perennial practices common to many of the world’s wisdom traditions but repressed by industrial modernity. Returning the quest to the center of our personal and political lives can rewild consciousness; it can bring politics into synergy with the evolving earth and complete our evolutionary leap into Homo sapiens sapiens, the self-conscious species ‘that knows that it knows’ that it is part of a living universe.

Names and affiliations: Alan Watson Featherstone: freelance ecologist, photographer, inspirational speaker & founder of the award-winning conservation charity, Trees for Life (UK)

Title of presentation/panel/round table discussion: Becoming truly indigenous to Planet Earth: human cultural changes necessary for wilderness to thrive

Format: Oral presentation

ABSTRACT: As the destruction of ecosystems and the extinction of species accelerates, a number of visionary projects and positive movements have been launched to help counter widespread habitat loss and the unfolding Sixth Mass Extinction event. These include the establishment of Rewilding initiatives in various countries, the Nature Needs Half project (which calls for 50% of the planet to be protected by 2030), and the United Nations' declaration of the years 2021-2030 as the UN Decade on Ecological Restoration.

However, a key factor that will determine their success, and the future survival of wilderness in the world, is a massive reduction in the collective impacts of our modern day lifestyles. It is only by bringing those down to a level that is truly sustainable that the planet's millions of other species, and the habitats they depend on, will flourish and thrive. This presentation will begin with a brief summary of the links between the development of our modern consumer culture, and its dogma of endless economic growth, and the accelerating depletion of the biosphere. Its main focus though will be on the essential changes that are necessary to significantly reduce our human demands on the planet, such as a large-scale shift to plant-based diets to free up the land (and oceans) for biodiversity and rewilding.

Names and affiliations: Shang CHEN, Ph.D, Senior Scientist Research Center for Coastal Zone, First Institute of Oceanography, Ministry of Natural Resources of China (FIO, MNR)

Title of presentation/panel/round table discussion: Nature Needs Half: Spatial Scaling of Marine Protected Areas in China Seas

Format: Oral presentation

ABSTRACT: Nature Needs Half looks like an ambitious goal by natural protectors. However, it is necessary to meet the ecological security for the sustainable development for our society. Terrestrial nature needs half, also marine nature needs half. Only 4.6% sea areas is under the strict protection against impairment as the Protected Areas in China seas. An ambitious spatial scaling of protected areas in China seas is proposed by this paper to meet the goal of Nature Needs Half. We suggest these four types of marine protected areas, i.e. National Parks, Natural Reserves, Ocean Parks and Red Line Zones, which are selected for strict protection in China seas. Most of proposed Protected Areas are located near seashore and on shore where they are at the very high risk of damage from human activities on land and sea. The management policies and measures for each type of marine protected area are recommended too.

Names and affiliations: George Iordachescu, The University of Sheffield, Department of Politics, Post-Doctoral Researcher within the BIOSEC Project

Title of presentation/panel/round table discussion: Ten Years of Wilderness Protection in the European Union – A view from the East

Format: Oral presentation

ABSTRACT: In 2009, the European Parliament adopted a resolution which set the tone for wilderness protection and the Commission issued specific guidelines to enhance wilderness in the Natura2000 network. These transformations were possible only due to the development of a network of practitioners, scholars, and civil society supporters. Although many remarkable projects and successful campaigns were backed by political actors, few states committed to translating wilderness protection into domestic legislation. While Germany has pledged to protect 2% of its territory as wilderness reserves, Romania still delays the mapping and inscription of the largest surfaces of primary forests on the continent. Moreover, it seems that wilderness protection developed unevenly across the continent resulting in the creation of a green internal periphery. The Eastern half of the continent has been targeted in the last decade by most of the wilderness protection and rewilding initiatives, from Rewilding Europe's iconic projects of Armeniş or Velebit to the more recent Endangered Landscape Programme supporting the Carpathia or Polesia projects. Here, most of the conservation opportunities that have been taken for granted so far, such as land abandonment, wildlife return, and rural depopulation hide deeper socio-economic transformations specific to post-socialist societies. Without paying more attention to such transformations, the steady development of wilderness protection in Eastern Europe achieved so far, could come to a halt with dramatic outcomes for nature and humans alike.

Panel: Nature-culture Linkages in UNESCO Designated World Heritage Sites

Names and affiliations: Vinod B Mathur (Wildlife Institute of India) | Dr Shikha Jain (Wildlife Institute of India) | Dr Sonali Ghosh (Wildlife Institute of India) | Niraj Kakati (Wildlife Institute of India)

Title of presentation/panel/round table discussion: The making of a vanishing non-charismatic species: How the conservation discourse in 20th century has framed Great Indian Bustard in Indian Media.

Format: Oral presentation

ABSTRACT: Conservation has been dominated by various frames influenced by various socio-political and economic factors. This research tries to explore an historical question about a species which has very little relevance for inclusion in the modern-day conservation political framework of India as evident by the history of 50 years. The findings show that changes in the temporal priority has been gradual after 1950's but the narratives were found to be more punctuated reflecting abrupt socio-politically influenced events affecting more greatly the public sphere. The early 50's and 60's were crucial years in getting the wildlife conservation and Great Indian Bustard crises in the mainstream public discourse as well as initiate relevant political and policy-based discussions. Three events primarily have been identified and developed into distinct case studies empirically from the data set and earlier literature. There are 'blind' notions of experts around 1980's where the idea of 'virtual populations' has formed, resulting in false impression of increased population, opposite of reality. The metaphor of 'Non-charismatic species' has been used to communicate the failure of various stakeholders to get the necessary attention and effort, assuming that charisma reflects conservation. This study reflects media as an effective tool for generating historical data for species conservation along with understanding evolving public discourse in society.

Panel: Preserving world natural heritage sites- the last frontiers of wilderness

Names and affiliations: Vinod B Mathur (Wildlife Institute of India) | Mr. Anuranjan Roy (Wildlife Institute of India) | Ms. Prerna Singh Bindra (UNESCO-C2C) | Dr Sonali Ghosh (UNESCO-C2C)

Title of presentation/panel/round table discussion: Nature-culture linkages in UNESCO designated World Heritage sites

Format: Panel of speakers

ABSTRACT: World Heritage Sites (WHS) have Outstanding Universal Value which implies sites of exceptional significance that transcend national boundaries and are considered to be of common importance for present and future generations of all humanity. Hence, the permanent protection of this heritage is of the highest importance to the international community as a whole. Natural WHS are widely recognized as the world's most important protected areas contributing to achieving global conservation goals. Such natural sites are also the last remaining preserves of wilderness harbouring unique flora and fauna species and representing significant ecological and biological processes.

The UNESCO Category 2 Centre (C2C) for 'World Natural Heritage Management and Training for the Asia and Pacific Region' established at the Wildlife Institute of India (WII), Dehradun, an autonomous institution under the Ministry of Environment, Forest and Climate Change, Government of India, is mandated to strengthen capacity of stakeholders in conservation, management and documentation of WHS in the region. While there are seven natural WHS in India, the UNESCO C2C at WII has been increasingly engaged with Mixed (cultural and natural) WHS and Cultural Landscapes which have been underrepresented categories of WHSs. The new paradigm seeks to acknowledge the synergy in the values of both cultural and natural elements of a site as well as recognise the interaction between human population and its environment in shaping the characteristics of the landscape.

Panel: The Evolution of Leadership

Names and affiliations: Crista Valentino (The WILD Foundation/CoalitionWILD) | Elliot Connor (Human Nature Projects) | Suyash Kashari (Photographer) | Mariasole Bianco (WorldRise and IUCN WCPA) | Nancy Shea (Mountainside Institute and University of Wyoming)

Title of presentation/panel/round table discussion: The Evolution of Leadership

Format: Panel of speakers

ABSTRACT: A panel of speakers will be facilitated by Crista Valentino, Founder and Director of CoalitionWILD, to discuss how leadership has evolved over the last 50 years and why it is imperative for us to evolve along with it in order to continue to engage new generations and constituents. The panel will consist of global leaders that vary in age, demographic, and nationality ranging from a teenager through veteran conservationists to give the audience a true breadth of understanding how age plays a major role in the success of an individual, their team, and their impact. Facilitated by Crista Valentino, who has success developing and leading a growing, international movement of emerging leaders, the panelists will be asked a series of pointed questions that get to the root of intergenerational dialogue, challenges in workplace environments, mentorship, knowledge sharing, and stigmas surrounding generational assumptions. The conversation will be provocative, encouraging panelists to speak candidly and honestly about frustrations, challenges, and needs in order to produce true change in the sector. Audience members will be encouraged to participate via Q&A and submitted questions real-time via twitter, which will be monitored by the facilitator.

Panel: Large Landscape Conservation: Community-based Conservation of Wildlife

Names and affiliations: Gary Tabor (Center for Large Landscape Conservation) | Ruth DeFries (Columbia University) | Milind Pariwakam (Wildlife Conservation Trust) | Amrita Neelakantan (Network for Conserving Central India)

Title of presentation/panel/round table discussion: Connecting People and Wildlife across Large Landscapes

Format: Panel of speakers

ABSTRACT: Conservationists working from local to global scales agree that there is an urgent need to protect the last remaining wild spaces on the planet, and that protecting and restoring the natural connections between protected and conserved areas (i.e., OECMs) is a key component of effective conservation strategies that ensure thriving wildlife and healthy ecosystems now and for the future. Conservation success in human dominated spaces is unlikely if approaches harm vulnerable human communities. Maintaining the critical connections across large land- and seascapes is a function of compatible conservation practices that balance the needs of nature and human livelihoods. With climate change exacerbating the impacts of habitat fragmentation, now is the time for innovation in community-based conservation where people thrive and biodiversity conservation is enhanced. In this panel, we aim to explore the work and impact of collaborative networks of organizations to balance human development needs and wildlife/wildland conservation. We consider the state of knowledge and practice to confront both biodiversity loss and climate change. Focus is on how networks apply the latest scientific expertise to champion local leadership that plans and implements landscape-scale management to achieve the health and resilience of both human and wildlife across the mosaic of uses among and between protected and conserved areas. We show how these networks utilize dynamic collaboration frameworks to achieve the twin goals of human development and nature conservation that is crucial for halting biodiversity loss and combating climate change and other future threats. Participants will learn through presentations and discussion about the challenges, solutions, and achievements that are connecting people and wildlife across large landscapes. They will be introduced to examples from around the world, their socio-ecological characteristics, and the innovative approaches that are enhancing conservation outcomes.

Panel: Achieving 'Nature Needs Half' in India: An Economic Evaluation of Existing Institutions

Names and affiliations: Rushikesh Chavan (Wildlife Conservation Trust) | Aniket Bhatkhande (Wildlife Conservation Trust) | Pooja Patki (Wildlife Conservation Trust)

Title of presentation/panel/round table discussion: Achieving 'Nature Needs Half' in India: An Economic Evaluation of Existing Institutions

Format: Panel of speakers

ABSTRACT: 'Nature Needs Half' means ridding at least 50% of all natural ecosystems of anthropogenic pressures. However, only 15% of terrestrial ecosystems are protected currently. The Global South houses many of the last remaining biodiversity-rich areas, where increasing development needs and high population densities put immense pressure on natural resources. Under the existing market structure, for countries that lie on the lower end of the income spectrum, the incentives are tilted towards transferring terrestrial and marine ecosystems to non-forest uses for short-term gains in the name of GDP growth. Additionally, the burgeoning human population is putting tremendous pressure on land and water, resulting in extraction of resources at rates that are much higher than the regenerative capacity of ecosystems.

Adoption of 'Nature Needs Half' will mandate efficient and equitable distribution of benefits emanating from natural ecosystems and designing inclusive and sustainable institutions to protect them. Indian forests are governed by institutions with colonial roots, which are largely extractive. Since institutions play a key role in structuring economic, political and social interactions, we analyse the Forest Development Corporations (FDCs) using tools of New Institutional Economics and Game Theory.

Panel: Wilderness and Ecological Civilization

Names and affiliations: Dr. ZHOU Jinfeng (China Biodiversity Conservation and Green Development Foundation) | Rajendra Shende (TERRE Policy Centre, India) | Rajendra Pachauri (former president of Intergovernmental Panel on Climate Change) | Alice Hughes (Chinese Academy of Sciences) | SHAO Wenjie (the industry's influential environmental protection We Media "wilderness protection" operator) | XING Ba (Conservation Area for lion in Kenya)

Title of presentation/panel/round table discussion: Wilderness and Ecological Civilization

Format: Panel of speakers

If you propose a panel of speakers, please identify speakers and topics of presentation:

Rajendra Shende, the president of TERRE Policy Centre, India

Rajendra Pachauri, the former president of Intergovernmental Panel on Climate Change (IPCC),

Alice Hughes, associate Professor, Chinese Academy of Sciences

Shao Wenjie, environmentalists, the industry's influential environmental protection We Media "wilderness protection" operator

Xing Ba, the head of Conservation Area for lion in Kenya.

ABSTRACT: The Progress Report on China's Implementation of the UN Millennium Development Goals (MDGs) has drawn wide attention to biodiversity as "Slowing Down Biodiversity Loss" is the only MDG not yet achieved. China has been on the fast track of building Ecological Civilization, as an agreed upon solution to the rising crisis of Biodiversity and Climate Emergency, with the latter substantially accelerating the pace of the former. China Biodiversity Conservation and Green Development Foundation (CBCGDF) has been persistently devoted to the study of Ecological Civilization and its promotion. And CBCGDF upholds that, in order to build Ecological Civilization, the development and exchange of the Wilderness concept is essential because "protecting wilderness recognizes harmony between nature and human society", which is integral to Ecological Civilization. So far, CBCGDF's work around Wilderness consists of three primary modules: (1) Popularizing Wilderness and Wildness in Cities. This includes such series initiatives as "City Wilderness", "Let the Weeds Grow", "Penetrable Parking Space", "University Conservation Area", "City Wetland" and "Street-Corner Garden". (2) Keeping close track of False Ecological Projects. CBCGDF has noticed a surge of problematic projects with hazardous impact on biodiversity and ecology but initiated under the name of building Ecological Civilization. CBCGDF has been making caution of these projects, like the Shanghai Eastern Mudflat Afforestation Project, Tianjin Bagua Mudflat Incidence, Shanxi Linfen Firefly Alley and the Opening of the Sun Island Bund in Harbin. (3) Protecting species and their habitats using nature-based solutions, encouraging public involvement and advocating wild-release as the most effective approach for the rescue of wildlife. In May of 2019, CBCGDF's 70-day long project of Near-Wild Rescue of Malayan Pangolins successfully restored pangolins' health. "Wilderness has never been more important than it is today. But it is not as important today as it will be tomorrow!"

Roundtable Discussion: The Green New Deal in Canada: Transformation to Better Stewardship and a Restoration Economy

Names and affiliations: Josef Kuhn, Ecologist; Ray Travers, Forester

Title of presentation/panel/round table discussion: The Green New Deal in Canada: Transformation to Better Stewardship and a Restoration Economy

Format: Round table discussion proposal

ABSTRACT: In Canada, as in many places around the world, a transformation in the process of governance is envisioned that will address the shortcomings of twentieth century industrial development. In many countries this alternative is being referred to as the Green New Deal. Two rapidly developing, interconnected global calamities are recognized as the primary drivers necessitating this transition. The first is climate change and the second is increasingly dysfunctional economies that fail to address bio-physical and socio-economic realities and needs.

The initiative in Canada is benefitting significantly from recent developments in the U.S.A. to the south, as well as in Europe and around the world. Over 150 community level “town hall” meetings have been held in 2019 to launch what is referred to in Canada as “The Pact for a Green New Deal.” It is significant that this is truly a ‘think globally, act locally’ initiative.

This brief paper presents some of the initial concepts, ideas and strategy considerations presently being addressed to ‘make it happen.’ Environmental and natural resource stewardship, the need for a restorative economy and networking within Canada and beyond are recognized as especially important in this early phase of development. The well-being of future generations, linked to our present responsibility to maintain healthy ecosystems, stands out as the primary consideration. Keeping approximately one-half of our land and water surface areas in a near natural ‘wild’ state, close to what the Creator provided, is a key aspect. Respect and love for creation are required.

Roundtable Discussion: Opportunities for Integrated Action on Biodiversity Conservation and Sustainable Development: Post 2020 Framework- A New Deal for Nature and People

Names and affiliations: Vishaish Uppal, Director, Governance-Law-Policy Programme, WWF india

Title of presentation/panel/round table discussion: Opportunities for Integrated Action on Biodiversity Conservation and Sustainable Development: Post 2020 Framework- A New Deal for Nature and People

Format: Round table discussion proposal

ABSTRACT: We have before us an unparalleled opportunity as we head into the year 2020, a critical year when the world will review its progress on the SDGs. The Paris Agreement will come into effect, and a new 10 year strategic plan for biodiversity under the Convention on Biological Diversity (CBD) will also be agreed upon. In addition, the world will come together in 2020 to celebrate 75 years of the UN. For the success of all of these we need to redefine how we value nature and safeguard biodiversity and the health of the planetary ecosystems.

At the fourteenth meeting of the Conference of the Parties (CoP) to the CBD, it was decided (decision 14/34) that there is a need for an ambitious and robust Post 2020 global biodiversity framework which can build on the lessons learnt and create an integrated approach to achieve the 2050 Vision of 'Living in harmony with nature'. It was also decided that the post-2020 global biodiversity framework should be developed through a participatory process and will be considered for adoption in the fifteenth meeting of the CoP.

The decision established a set of principles (participatory, inclusive, gender responsive, transformative, comprehensive, catalytic, visible, knowledge-based, transparent, efficient, results-oriented, iterative and flexible) to guide the process. It also sets out a comprehensive consultation process, including provisions for global, regional and thematic consultation meetings. Additionally, the decision urges other stakeholders like non-governmental organisations to be actively engaged in the process and facilitate dialogue on the framework, so that all can contribute to a robust post-2020 global biodiversity framework to foster a strong ownership of the framework and create sturdy and powerful support for its implementation.

Building on the momentum for 2020, India also needs to initiate processes for governments, civil society and business to come together to provide constructive inputs for a New Deal for Nature and People - a set of coherent, complementary and highly ambitious agreements and commitments, that together aim to reverse the decline in nature by 2030 for the benefit of nature and people. For this purpose, a panel discussion on how India and other players can champion for a robust Post 2020 framework is being organised to build an understanding and agreement on the next steps on how we can create ambition within the country and contribute into developing an ambitious and robust post 2020 framework

Panel: Saving the Wild High Seas: How MPAs in Areas Beyond National Jurisdiction Can Contribute to International Conservation Goals

Names and affiliations: CHEN Jiliang (Greenovation Hub) | Claire Christian (Antarctic and Southern Ocean Coalition) | Nicole Bransome (The Pew Charitable Trusts) | CHEN Jiliang (Greenovation Hub) | LIBinbin (Duke Kunshan University)

Title of presentation/panel/round table discussion: Saving the Wild High Seas: How MPAs in Areas Beyond National Jurisdiction Can Contribute to International Conservation Goals

Format: Panel of speakers

ABSTRACT: By designating the world's first high-seas marine protected areas (MPAs) in the South Orkney Islands and the Ross Sea (both off Antarctica), the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) has set an important precedent for the large-scale protection of marine areas beyond national jurisdiction. Establishing MPAs is also likely to be a major function of a new UN treaty on the conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction that is currently under negotiation. As two-thirds of the ocean is considered to be high seas, it is impossible to effectively conserve ocean ecosystems and reach global conservation targets without looking at areas beyond national jurisdiction. This panel will bring together experts in Antarctic and marine conservation from a variety of science and policy backgrounds to discuss how to accelerate the process of high-seas MPA protection, both within CCAMLR and beyond. The panel will also highlight international conservation goals, such as the Aichi Biodiversity Targets, and how Antarctic and other high-seas protections contribute to those goals. In 2020, there will also be a major Convention on Biological Diversity Conference of the Parties (COP), which "will adopt a post-2020 global biodiversity framework as a stepping stone towards the 2050 Vision of "Living in harmony with nature. With estimates of ongoing biodiversity loss presenting a dire picture of the state of global wilderness protection, countries must increase international efforts to prevent further declines. This will require increased efforts from all countries, including those that are still developing their own national MPA networks, such as China, where the 2020 CBD CoP will take place.

International Cooperation to Protect Wilderness Character

Names and affiliations: Dr. Karen Ho (Parvati.org), Mr. Rituraj Phukan (Ambassador for the Marine Arctic Peace Sanctuary, Parvati.org)

Title of presentation/panel/round table discussion: Marine Arctic Peace Sanctuary (MAPS)

Format: Oral presentation

ABSTRACT: The Marine Arctic Peace Sanctuary (MAPS) is the largest marine preserve in history. It encompasses the entire Arctic Ocean north of the Arctic Circle, and prohibits all exploitation and militarization that threatens the health of this vulnerable ecosystem—and indeed all life on Earth. The Arctic Ocean is a critically important area for biodiversity conservation, and sea ice is vital to the health of this ecosystem. However, sea ice is melting at an unprecedented rate. With 75% less summer ice than just half a century ago and parts of the Arctic Ocean are now 4C/7F too hot, the loss of ice is altering the habitats, feeding patterns and primary production of ice-associated species. As reflective sea ice is lost, solar radiation is increasingly absorbed, raising the temperatures of already warm waters and amplifying global temperature rise. But instead of treating this as a global catastrophe, government and corporate interests seek to take advantage of the Arctic Ocean’s vulnerability. Commercial fishing vessels damage the Arctic Ocean seabed with trawls and contribute to underwater noise pollution. Arctic shipping routes are being planned and tested. Excessive ocean noise from seismic surveys for oil and gas, military sonar and deployment of explosives, is resulting in injury to and displacement of marine animals from native habitats and stranding of whales. By prohibiting these harmful activities, MAPS safeguards the rich biodiversity of the Arctic Ocean. Furthermore, by ensuring Arctic seabed oil and gas reserves will never be exploited, up to 148 trillion kilograms of CO2 emissions will remain buried. MAPS fits naturally with the United Nations commitment to protect 10% of our oceans by 2020, and supports almost every UN sustainable development goal. MAPS is a baseline necessity to preserve the pristine Arctic Ocean, and all life on Earth.

Names and affiliations: Dr. Elaine (LAN Yin) Hsiao (Sheffield Institute for International Development)

Title of presentation/panel/round table discussion: Missing Peace: why transboundary conservation areas are not resolving conflicts

Format: Oral presentation

ABSTRACT: Transboundary Conservation Areas, such as Parks for Peace, have been heralded for their potential to simultaneously contribute to biodiversity conservation and peace, but evidence to this effect has been elusive. In fact, more indications suggest that transboundary conservation areas, including Parks for Peace, rely on pre-existing international peace between countries for formalization and on-going non-violent relations for continuity. Although they are primarily designed for ecological peace (based largely on arguments of ecological connectivity), they are not immune to environmental harms. Perhaps even more challenging is how “fortress conservation” and “green securitization” compromise social peace. In my research, I propose that transboundary conservation areas and Parks for Peace have not remedied the violence of protected areas or facilitated the peace dividends envisioned because they are not appropriately designed for international peace (between states), social peace (between peoples) and ecological peace (between humans and the rest of nature). Design in this case refers to “the legal and governance framework which stipulates why a transboundary conservation area is being created, how it shall be constituted and governed, as well as who is responsible for what activities within the territory in order to achieve its goals or principles, and any other aspect of its constitution.” This study is based on a legal review of 56 transboundary agreements representing 32 transboundary conservation areas, complemented by online survey responses from 88 practitioners who worked in a total of 80 transboundary conservation areas, and field research in two case studies from Africa’s Great Rift Valley (the Greater Virunga Landscape between Democratic Republic of the Congo (DRC), Rwanda, and Uganda; and Kidepo Landscape between South Sudan and Uganda).

Names and affiliations: Arlo Hemphill (Greenpeace USA), Pilar Marcos Rodriguez (Greenpeace España), Celia Ojeda Martinez (Greenpeace España), John Hocevar (Greenpeace USA)

Title of presentation/panel/round table discussion: Science, Ships and Celebrities – Campaigning for a Global Ocean Treaty in the Sargasso Sea

Format: Oral presentation

ABSTRACT: Set within one of the five oceanic gyres that accumulate and retain plastic pollution, the Sargasso Sea is a vast oceanic wilderness that largely lacks any governance mechanism capable of protecting its unique biodiversity. Also a hotspot for microplastics, the region presents a stark example from which to issue a clarion call for global action to reduce single-use plastics. To elevate awareness of the need to protect unique ecosystems on the global high seas, Greenpeace called attention to the plastic crisis in the Sargasso, delivering a multi-channeled campaign strategy that employed a portfolio of interlinked engagement tactics including compelling science, the lure of Greenpeace’s iconic ships, media and celebrity outreach, and local engagement. Science results from the expedition found concentrations of microplastics that are comparable to and may even exceed those from the better-known gyre in the north Pacific (aka the Great Pacific Garbage Patch). This news, spread through tier one media outlets, celebrity spokespeople and social media channels reached millions of people in August 2019. The ship tour to the Sargasso Sea took place as part of the Greenpeace Pole-to-Pole expedition, a nearly yearlong voyage from the Arctic to the Antarctic to highlight the many threats facing the oceans and to campaign for a Global Ocean Treaty to protect biodiversity in international waters.

Names and affiliations: David Johns, Portland State University

Title of presentation/panel/round table discussion: Decolonizing the Natural World

Format: Oral presentation

ABSTRACT: Two UN reports were published in 2019: the UNEP found that “resource” extraction was responsible for 80% of biodiversity loss and 50% of GHG emissions; the IPBES found that a million species were at risk from extinction because of human activities. The reports are unusual in addressing causes: too many people consuming too much. Wholesale societal is needed so biodiversity can recover. Both reports call for action but do not say how that action is to be brought about. As with the Millennium goals and Aichi targets such calls are not self-executing. A colonial relationship of domination and exploitation exists between human societies and the natural world. Humans rearrange ecosystems, the homes and lives of other species to suit themselves without regard for the costs to the latter. The task for conservation is decolonization—dismantling that domination. Decolonization presents enormous challenges: We must set aside huge areas of the Earth for the millions of other species. We don’t know what biodiversity compatible human societies look like. The change needed is fundamental, but against great odds human slavery is largely gone, apartheid has fallen in South Africa and many empires have been beaten back. We can learn from these struggles. To succeed with decolonization we must understand power. Abolitionist Frederick Douglass recognized that power concedes nothing without a fight though many want rain without storms. Fundamental change is contentious and transgressive politics, which are risky. We are good at perseverance but must build networks and community as a basis for new institutions and societies. Justice must be extended to all life. Networks will only thrive with a new culture—new myths, morality tales, song, art, and film. The question remains—can we mobilize enough people to act on behalf of the Earth and other species?

Panel: Regional Protected Area Partnerships: Learning from the Experience to Date in North America and Asia

Names and affiliations: Scott Perkin (IUCN), Minsun Kim (IUCN)

Title of presentation/panel/round table discussion: The Asia Protected Area Partnership: An innovative mechanism for helping Asia's protected areas to address tourism and other key management challenges

Format: Round table discussion proposal

ABSTRACT: The Asia Protected Areas Partnership (APAP) is an informal regional platform for government protected area agencies and other stakeholders that has been created to: promote best practices and innovative solutions to the challenges facing the region's protected areas; strengthen transboundary and regional cooperation; and raise awareness of the multiple benefits of Asia's protected areas, both within and outside the region. Since its launch in 2014, APAP has grown rapidly and it now has 19 Members from 17 countries, as well as two Associate Members.

The round table discussion will introduce the Asia Protected Areas Partnership as an innovative mechanism for promoting and strengthening protected areas in the region. The second half will look more deeply at the issue of tourism management and the lessons and recommendations to emerge from the sustainable tourism technical workshop. The roundtable discussion will seek to address the following questions:

- What are the benefits arising from successfully designed and functioning PA partnerships?
- What are the challenges involved in maintaining a partnership over the long-term?
- What are the factors that contribute to successful PA partnerships?
- What are the key protected area issues and challenges that PA Partnerships should seek to address over the next five years?
- How might APAP help to achieve the Post-2020 Global Biodiversity Framework?
- How can partnerships such as APAP help to address issues such as tourism management?
- How can protected areas balance the need to generate income from tourism with the protection of biodiversity and other values?
- What are the emerging best practices from Asia and elsewhere?

At the end of the round table discussion, the plans for the 2nd Asia Parks Congress (APC) will be briefly introduced. The 2nd APC will be held in May 2021 in Kota Kinabalu, Malaysia under the auspices of APAP, and will be one of the first major conservation events to take place in Asia after the adoption of the Post-2020 Biodiversity Framework at CBD COP-15. It will also provide an important stepping stone between WILD 11 and the next IUCN World Parks Congress. The floor will be opened to receive feedback from WILD 11 participants about the overall programme for the 2nd APC and the priorities it should address.

Names and affiliations: Adam Hanson (WILD Foundation) and other members from Mexican National Commission on Natural Protected Areas (CONANP); Parks Canada Agency; and the U.S. Bureau of Land Management, Fish & Wildlife Service, Forest Service, National Park Service

Title of presentation/panel/round table discussion: NAWPA—A Model for Transboundary, Continental Leadership for Protected Areas and Wilderness

Format: Panel of speakers

ABSTRACT: The North American Committee on Cooperation for Wilderness and Protected Areas Conservation (NAWPA) is a collaborative initiative fostering the exchange of ideas, experiences, best practices, and innovative solutions on shared conservation opportunities at the North American continental scale and across multiple agencies and jurisdictions. NAWPA comprises six of the largest North American land and resource management agencies, which together manage 15% of the continental landmass. Protected areas and wilderness play a critical role in conserving biodiversity and supporting human health and well-being. They provide recreation, education, and research opportunities and support the economy by providing resource benefits, ecosystem services, tourist destinations, and ecological resilience. NAWPA agencies promote sound management for these areas through: conservation and restoration efforts; public outreach, youth engagement, and education initiatives; recreation and visitor enjoyment opportunities; and capacity-building activities. NAWPA member(s) will present together and describe the NAWPA vision for collaboration across countries and lessons learned that would help replicating successes.

Panel: Environmental law and big cats conservation in America. Tools and resources to combat wildlife crimes

Names and affiliations: Angel Daen Morales Garcia (Biofutura A.C. & IUCN WCPA-WCEL-CEESP member), Jonatan Job Morales Garcia (Biofutura A.C.)

Title of presentation/panel/round table discussion: CULTURAL HERITAGE, BIODIVERSITY AND BIOETHICAL; THE CASE OF MEXICAN JAGUAR

Format: Panel of speakers

ABSTRACT: This work addresses the importance of the jaguar (*Panthera onca*) in the Mexican sociocultural and bioethical context, especially from the intrinsic relationship that has been consolidated since pre-Hispanic times of this species with indigenous peoples and communities that incorporated this animal into its cultural practices, generating a human-jaguar relationship that is part of the collective memory and cultural rights. Through a legal-social study it is concluded that social and environmental conditions have reduced the symbolic, material and ecological space of this species, affecting cultural rights directly. It is necessary to carry out actions for its conservation from a holistic biocultural approach, establish mechanisms to safeguard the cultural practices related to this species that are compatible with its conservation and adhere to the legal framework, implement strategies to consider the cultural practices associated with this feline as Intangible cultural heritage and formalized by a decree that the jaguar is a national symbol for the conservation of biodiversity in Mexico and Mesoamerica.

Names and affiliations: Md Golam Rabbi (Bangladesh Forest Department)

Title of presentation/panel/round table discussion: Wildlife Trafficking: A Case Study of Bangladesh

Format: Oral presentation

ABSTRACT: The concept of wildlife crime is relevantly new in Bangladesh. Before 2010, the Bangladesh Forest Department (BFD) and other enforcement agencies were not in full swing to find out the organized crime scene at that time and recorded few cases, along with forest crime. This review paper is aimed at the recent trends of wildlife trafficking and prosecution status by using Wildlife Crime Control Unit (WCCU) data. The monetary value of wildlife crime in Bangladesh is approximate \$0.72M/year and the maximum value counted for reptiles around \$0.45M, especially for high level trafficking of geckos and turtles. Between July 2012 and June 2019, WCCU detected 408 offenses (272 cases filed) with 95 offenders and seized 30,095 wildlife & 882 trophies. In 60% of detected cases offenders are not identified. Only 20% of cases are decided by the courts even after 8 years. The conviction rate is 70.65%. The most common seizures are birds which have domestic demand for pets. Turtles, lizards and small mammals are also on the list. Venison and migratory water birds are often seized, which has a large quantity demand for consume at an aristocratic level. Due to a porous border, poachers traffick geckos, turtles & tortoises, snakes, venom, tiger and body parts, pangolin etc. Those have very high demand in some Asian countries for so-called medicinal purposes. Recent surveys also demonstrate new routes - poaching of tiger & deer from Sundarbans and sharks & ray fish to Thailand and Myanmar through the Bay of Bengal.

Names and affiliations: Stuart Chapman (World Wide Fund for Nature), T.N.E. Gray (Wildlife Alliance)

Title of presentation/panel/round table discussion: Snares and Silence: a wildlife crisis in Southeast Asia, coming to a reserve near you soon

Format: Oral presentation

ABSTRACT: The use of wire snares are causing dramatic declines, and in some cases, local extinctions of wildlife populations. Documented levels of snaring in some Southeast Asian countries are possibly the highest in the world and represent a significant threat to tigers and tiger prey species. The solutions are simple and low tech but are not keeping pace with the volume of snares and need to be urgently prioritised. The presentation will discuss the wider impact of snaring on biodiversity across Southeast Asia and related mitigation measures that need urgent attention to arrest this crisis.

Names and affiliations: John Blay (Australia)

Title of presentation/panel/round table discussion: The Curse of the Wild Horses: de-romanticising a plague of feral wildlife (to save Australia's unique High Country and its wildlife).

Format: Oral presentation

ABSTRACT: A walk in wilderness areas of Australia's Kosciuszko National Park reveals inordinate numbers of feral animals. They include horses, whose population has increased rapidly despite ongoing drought. In Byadbo Wilderness the horses are in a deplorable condition. Many have starved to death painfully, even beside the iconic Snowy River. Unchecked numbers seriously threaten catchments throughout the 6,900-square-kilometre park, as well as its high country and alpine biodiversity. But horses are de facto protected from culling or re-homing by 2018 laws that class them as a 'heritage' species with the support of public sentiment fostered by writings and artworks, even poems like *The Man from the Snowy River*, which extol the wild bush horses. It is now time to reinterpret these to engage the popular imagination with the realistic truth of the predicament. Feral horse populations are increasing at an inordinate rate. Desperate action is called for. Poets, artists, scientists and other opinion-makers need to de-romanticize the feral animals in support of changes to the law to ensure the horse numbers are humanely reduced as soon as possible. If, as Shelley once said, 'poets are the unacknowledged legislators of the world', we should re-legislate for the survival of wild nature beyond this day and age.

Names and affiliations: Bidyut Bikash Barman (Wildlife Institute of India), Ashish Prasad (Wildlife Institute of India), Dr. Nita Shah (Bombay Natural History Society), Qamar Qureshi (Wildlife Institute of India)

Title of presentation/panel/round table discussion: Indian Wild Ass in Saline Mud-plains of Little Rann of Kutch: The Legacy against All Odds

Format: Oral presentation

ABSTRACT: The last remaining population of Indian wild ass is restricted to Little Rann of Kutch landscape in India. The landscape is human-dominated with immense anthropogenic pressure. It is important to know the abundance of Indian wild ass and how the only source population is distributed across the landscape. The vast spread of its habitat is the saline mud-plain which grows saline resistant grassland, scrub land and some seasonal grasslands. The Wild Ass population has been ranging across these grasslands and scrub lands since time immemorial. The Wild Ass population which was once abundant across Afghanistan and Baluchistan is now restricted to the western-most part of India. Conventional line transect and vehicle transect methods were used to estimate the abundance of Indian wild ass. Opportunistic sightings of wild ass herds in the landscape were also recorded. Along with each sighting, data on habitat parameters were also recorded. The density of Indian wild ass was found to be 9.06(SE 1.81) with detection probability as 0.53. It was interesting to find that the density of wild ass was more in areas affected by high agricultural activities in comparison to those areas where agriculture is poor. The agricultural blooming during the last decade has changed the livelihood preferences among the villagers and steered a shift in resource preference in Wild Ass as well. The crop-field survey in both irrigated and non-irrigated croplands with different fencing types suggested that nilgai and feral pigs were mostly responsible for crop raiding in both irrigated and non-irrigated crop fields with or without any fencing whereas Indian wild ass damaged open crop fields. Focal group discussion (FGD) and household surveys suggested a progressive trend in livelihood preference towards agriculture and reduced preference towards wild ass conservation among the people of Little Rann.

Are we addressing causes or symptoms?

Names and affiliations: Qi Jun (Southwest Forestry University, China)

Title of presentation/panel/round table discussion: Challenges of nature reserves governance in developing regions: A 10 years longitudinal study in Yunnan, China

Format: Oral presentation

ABSTRACT: The governance of nature reserves has strictly followed China's Nature Reserves Conservation Regulations which were enacted by the state council in 1994. Construction projects and individual activities that may damage the ecosystem have been banned by local government and relative departments. However, the word 'nature reserve' refers to its dynamic management system rather than the place itself. Projects of national importance or non-industrial, non-commercial facilities that only brings low impact to the ecosystem are allowed to proceed and boundaries and zoning of nature reserves may be authorized for re-delimiting to leave space for those exceptions. This study collected the documentary authorizations and annual report of nature reserves management from 2008 to 2018 in Yunnan Province (a Chinese typical developing region) to analyze the challenges of nature reserves governance, in the aims of finding the equilibrium between development and conservation.

Names and affiliations: Alan Watson Featherstone: freelance ecologist, inspirational speaker, founder of the award-winning conservation charity, Trees for Life (UK)

Title of presentation/panel/round table discussion: Threatened Araucaria Forests of the Andes Major

Format: Oral presentation

ABSTRACT: The monkey puzzle tree (*Araucaria araucana*) is the best known member of the Araucariaceae, one of the earliest families of conifers to have evolved on the planet. Formerly distributed almost worldwide, the trees of this family are now mostly confined to the southern hemisphere and the landmasses which previously formed the supercontinent Gondwana. *Araucaria araucana* itself is thought to have evolved at least 60 million years ago, but is now restricted to a small area of the southern Andes in Chile and Argentina and an isolated section of the Chilean coastal range mountains. The tree is integral to the culture of the indigenous Pehuénche people, who named themselves after it, but subsequent to European colonisation of the region it was heavily exploited for its timber, and large areas were burned to create cattle pastures. In response to its rapid decline the Chilean government declared *Araucaria araucana* a national monument in 1976, but exploitation continued through the 1980s.

Although most of the remaining stands are now protected as national parks in both Argentina and Chile, in reality the tree is continuing to decline, due to anthropogenic causes. These include climatic changes that are leading to hotter, drier summers and more frequent and intense fires; seed predation by introduced non-native wild boar; cattle grazing; competition from introduced non-native conifers and ecosystem degradation due to invasive introduced insects. This presentation will illustrate the unique features of this ancient and iconic conifer, the numerous species and ecological relationships that it supports in the southern Andes, and will highlight how a supposedly protected species now faces very serious threats to its survival.

Names and affiliations: Sanchi Singh, Dr. Sudipto Chatterjee (India)

Title of presentation/panel/round table discussion: Provisioning Ecosystem Services and Forest health of Rhododendron rich forests in Western Himalayas

Format: Oral presentation

ABSTRACT: Himalayan forests are an important component of global biodiversity and play a crucial role in maintaining overall ecosystem balance. Rhododendron species are found at an altitude of 1500m-3000m in the Himalayan region and act as an important species in the Himalayan ecosystem with high ecological and medicinal value. Rhododendron tree species belong to the Ericaceae family with bright reddish-pink flowers which provide a variety of ecosystem services to communities. Flowers of *R. arboreum* are used in making of Rhododendron squash, pickles and sauces which are sold in the markets and acts as a source of livelihood generation for the locals. However in the past few years due to the rampant usage of the flower for its trade there has been an increasing gap in the demand and supply thus posing a risk on valuable Rhododendron forest resource. As Rhododendron forests are an important keystone species in the Himalayas it is vital to maintain the forest health and vitality of the species as it plays a key role in maintaining the Himalayan ecosystem balance. Therefore our research lies in assessment of provisioning ecosystem services and forest health of Rhododendron rich forests in Western Himalayas for its sustainable use.

Names and affiliations: Nirmal Kulkarni, Chairman and Director, Mhadei Research Centre, Member, Goa State Biodiversity Board, Member Viper Specialist Group IUCN

Title of presentation/panel/round table discussion: The Wilderdest Story.

Format: Oral presentation

ABSTRACT: The Mahdei Bio region is steeped in rich cultural history. The discovery of ancient rock art carvings at Viridi village prove the existence of an ancient civilization on the banks of the Valvanti, a river which is the tributary of the Mhadei, Goa's lifeline. The presence of Hindu icons including that of the Saptamaturkas, Ganesh and Vetala in Chorla and Sada villages of Karnataka go on to prove the strong presence of ancient culture in the region.

Ecologically, the region is significantly very important, as it is the catchment area for the tributaries of the Mahdei River, i.e. the Haltar nallah and the Valvanti River amongst others. The mixed moist deciduous and semi evergreen forests nurture and support a criss-cross network of rivulets and streams that support vast diversity of life forms, many of which are endemic and threatened in the Western Ghats.

A 'wildlife corridor' that allows free movement of large mammals like tigers, leopards and wild dogs, the Mahdei region is wedged between the tri-state boundaries of Goa, Karnataka and Maharashtra. The region is ecologically important and rich in minerals — a dangerous trait for any forest.

A trip to the region twenty years ago prompted Captain Nitin Dhond, a merchant navy Captain and our Managing Director today, to rescue it from the pressures of timber and mining lobbies and cash crop monoculture planters. His vision brought together a team of nature lovers and wildlife professionals, a herpetologist and ecologist to create a dream project that initiated environmentally-conscious tourism in Goa.

Roundtable Discussion: Addressing Causes Instead of Symptoms

Names and affiliations: David Johns (Portland State University) | Bill Ryerson (Population Media Center) | Susan Masiyiwa (Gorongosa National Park)

Title of presentation/panel/round table discussion: Addressing Causes Instead of Symptoms

Format: Round table discussion proposal

ABSTRACT: Although rates of global population increase have declined slightly, humans continue to impose 80+ million additional people on the Earth each year—the same number as when rates were much higher a few decades ago. The burden of these millions is increased by higher levels of consumption, including cars, metals, energy, food (including meat), fresh water, computers and weapons. The impact on biodiversity is significant, documented by the Living Planet Index and report (populations of 10,000 vertebrate species have declined by more than half in two human generations); the IPBES report on biodiversity (1 million species at risk of extinction due to human activities) and the UNEP resource forecast report, finding that 80% of biodiversity loss is due to human resource extraction. At the 2015 SCB global meeting in Montpellier France scientists were asked why they did not address the causes of biodiversity loss, i.e. human numbers and actions. Their responses were disturbing: the problem was too big and they did not know where to start; they would lose funding; their peers would discourage them and avoid them; promotion and tenure would be at risk. Notwithstanding the recognition of causes, none of the reports go beyond calls for action; there are concrete proposals to force decision makers to act. Can conservation continue to ignore the causes of wilderness and biodiversity loss and focus mostly or only on direct protection? What are the elements of a strategy to pursue human population decline; a strategy to halt and reverse increasing consumption?

Roundtable Discussion: Women's Purchasing Power in Conservation: an Intersectional Lens

Names and affiliations: Melina McConatha, MSW PhD Psychology and Human Services, Lincoln University USA

Title of presentation/panel/round table discussion: Women's Purchasing Power in Conservation: An Intersectional Lens

Format: Round table discussion proposal

ABSTRACT: Praise ignorance, for what man has not encountered he has not destroyed ~Wendell Berry's Manifesto: The Mad Farmer Liberation Front

Economic modernization and resource driven human development has led to environmental degradation globally (Stern, 2010; Ciochetto, 2013). The majority of this "development" has been created, led, and implemented by men. Interestingly, research and advocacy in sustainability has been dominated by the natural sciences and, in turn, men. In response, many green movements stem from male-driven economic systems pushing for consumer-driven changes, such as buying locally and supporting organic food systems. Research suggest that women have purchasing power that represents a market larger than China and India combined (Silverstein and Sayre, 2009). In fact, with buying power and consumer influence combined, women control up to 80% of consumer purchasing (Brennan, 2018). This roundtable discussion centers on women's influence in purchasing or more specifically, less purchasing, to create change. This work looks to better understand how diverse women from various areas around the world have an opportunity for leadership in conservation science. This paper explores (1) women led community alternatives to purchasing, (2) ways to encourage environmental partnerships in advocacy in women's lives; (3) accessibility of conservation movements based on intersections of race, class, gender, age, and educational intersections; and (4) understanding the unique opportunity women hold as mothers, teachers, partners, caregivers and leaders in environmental change. As rewilding gains traction in conservation science (Jepson, 2015) this paper argues that it is equally important to examine the human behaviors that must change to create the space for other ecosystems to thrive.

Balancing tourism and conservation goals: Establishing a foundation

Names and affiliations: Riyaz Alam (Indian Institute of Technology Roorkee), Diptimayee Nayak (Indian Institute of Technology Roorkee)

Title of presentation/panel/round table discussion: A Systematic Review of Ecotourism in IUCN PAs

Format: Oral presentation

ABSTRACT: Indigenous communities in protected areas have long been bearing involuntary displacement impacts, since creation of Yellowstone National Park. Prior to the 1970s, the conservation paradigm was conservation-centric and had been happening even at the cost of well-being of forest residents. To cope up with such problems, ecotourism was initiated and popularized with the dual objective of biodiversity conservation and sustainable development. The present study aims to introduce the nature of conservation approaches around the world and their impacts on the socio-cultural and economic elements of local economies. An extensive review of literature on ecotourism published during 1987-2018, retrieved from two widely used databases: Scopus and Web of Science, using the search string, "Ecotourism" AND ("local communities" OR "Local People" OR "Forest Resident") was conducted. After applying the inclusion and exclusion criteria, 75 studies were selected, reviewed, critically analysed, and presented in a way that divulges the ground reality of ecotourism practices. Content Analysis is used to draw concrete theme(s) a particular study is based on. The study revealed that ecotourism signaled a shift from a paradigm in which forest residents were regarded as a threat to biodiversity, towards a paradigm in which forest people were recognized as critical for conservation. Earlier, thousands of forest dwellers were forcefully displaced following the logic that their traditional livelihood activities are unsustainable and a threat to biodiversity. However, later conservationists identified the potential of local communities regarding natural resource management, and recommended ecotourism be applied in charismatic biodiversity rich areas.

Names and affiliations: Jayalakshmi Paonam (TERI SAS)

Title of presentation/panel/round table discussion: The case of conservation versus cultural services of Loktak Lake: A Ramsar site in Manipur

Format: Oral presentation

ABSTRACT: Protected areas are regarded as a cornerstone for the conservation of biodiversity. Yet, at the same time, they also hold immense potential for providing benefits to mankind in the form of cultural ecosystem services (ES). Addressing both of the above outcomes is a challenge in the management of such sites. Loktak Lake, a Ramsar wetland of international significance situated at Bishenpur and Imphal West district, Manipur, India is an example. The lake has the only floating national park in the world, Keibul Lamjao National Park which is the only known habitat of globally endangered Sangai. It is also an IBA (International Bird Area) and part of the Indo-Burma Biodiversity hotspot. At the same time, Sendra island located near the lake is one of the state's major tourist hotspots contributing to the livelihood of a local community. Moreover, according to a National Capital Report the benefit incurred from the lake is 1,277 million rupees annually. However, the ecological health of the lake is in a state of decline. It is included in the Montreux record which calls attention to those wetlands in the Ramsar database where "changes in ecological character have occurred, is occurring, or is likely to occur". Hence, the study focuses on the applicability of the EBM (Ecosystem Based Management) concept on the ecosystem service component. It seeks to answer the following objectives: a) who are the stakeholders deriving benefit from the wetland? and b) what is the trend in the cultural and supporting ecosystem services of Loktak Lake? The data are to be collected through secondary literature, official datasets along with FGDs in 6 villages and key informant interviews of stakeholders identified through secondary literature and reconnaissance survey.

Names and affiliations: Diptimayee Nayak, Assistant Professor of Economics, Department of Humanities and Social Sciences Indian Institute of Technology, Roorkee, Uttarakhand, India

Title of presentation/panel/round table discussion: Ecotourism and Indian Protected Areas: Epistemology, Construct, Process and Practice

Format: Oral presentation

ABSTRACT: 'Ecotourism' has been recognized as a popular component of alternative tourism, benefiting the local economy and the environment as well. Side by side this concept is becoming more beleaguered– controversial and debated. This paper posits 'ecotourism'; the discussion explores the concept, episteme, construct, process and practice, revolving around the questions – where is 'eco' in 'ecotourism', analyzing rights, ethics and praxis. Therefore, this paper contextualizes and critically analyses local participation, benefits sharing, institutions involved, mechanism of tour operation by reviewing published studies on Indian protected areas to harness sustainability of ecotourism and conservation in the Indian context. It also takes up thread critically focusing the discourses and challenges of ecotourism faced at global scale in general and Indian protected areas in particular in mainstreaming its decision making process and policy stature.

Names and affiliations: Grant Dixon, Independent researcher, Australia

Title of presentation/panel/round table discussion: Wilderness tourism: a cautionary tale from the Tasmanian highlands

Format: Oral presentation

ABSTRACT: Since 2014 the Tasmanian government has been inviting expressions of interest from private investors and tourism operators to ‘develop sensitive and appropriate tourism experiences and associated infrastructure’ in reserved lands across Australia’s island state. In response to this invitation, a proposal was submitted for a helicopter-based luxury tourism development in a remote part of the Tasmanian Wilderness World Heritage Area (TWWHA). The proposal attracted widespread public opposition, particularly from wilderness enthusiasts and from recreational users of the area. The controversy highlighted a range of issues relating to wilderness protection and management including concerns about the lack of transparency in the development-proposal assessment process, the impacts of such developments on the area’s primitive and remote character, the risk of ongoing, incremental loss of wilderness values, the commercialisation of public assets, and access equity issues. When a local government authority refused permission for the development, the developer mounted an appeal. The resulting legal dispute served to test the effectiveness of the wilderness-protection frameworks in the statutory TWWHA management plan. The legal case is currently in progress and unresolved. The case highlights the need for robust statutory frameworks, processes and clear policy guidance on wilderness management including the performance standards to be met if wilderness values and the recreational values with which they are associated are to be maintained undiminished into the future.

Balancing tourism and conservation goals: Delivering the Goods

Names and affiliations: Suzanne van Hoven, EcoLife Africa Trust

Title of presentation/panel/round table discussion: The contribution of responsible educational ecotourism to rural communities in southern Africa

Format: Oral presentation

ABSTRACT: The very essence of ecotourism is responsible travel to areas that might be sensitive or fragile. The intention of such tourism is to have as little negative impact to the areas visited as possible. The biodiversity in South Africa has benefitted tremendously from ecotourism and it contributed R425.8bn (8.6%) to the GDP and contributed 1.5million jobs in 2018.

The successes of conservation efforts in South Africa are well documented. Biodiversity is a top priority for private as well as state conservation agencies. Wildlife conservation areas are mostly in the countryside. Rural communities neighbour these conservation areas. The success of wildlife conservation efforts therefore relies heavily on collaboration with local communities in the developing world. Factors that influence the daily lives of rural communities who live next to and inside conservation areas include: diseases that affect both wildlife and domestic animals, zoonotic diseases, wild animals that escape from fenced conservation areas and invade villages, benefits from conservation or the lack thereof and other socio-economic challenges. One of the big challenges for South Africa is the negative perceptions that exist surrounding land ownership for wildlife conservation purposes which were carried into the new democracy post 1994. Students of conservation and veterinary sciences across the world, are intrigued by the wildlife in southern Africa. Various private organisations and wildlife charities offer opportunities for these students to come and study and care for wildlife in southern Africa. These programs vary in length and intensity. Rural communities have become aware of the valuable contribution made by educational ecotourism. These students and volunteers have a positive influence on the care of the domestic animals, disease control, conservation awareness and the economy of villages.

Names and affiliations: Vinay Varman (India)

Title of presentation/panel/round table discussion: The wildlife recreation rules 2015 launched in Madhya Pradesh

Format: Oral presentation

ABSTRACT: People residing inside and around forest areas are deprived of getting adequate employment and feel neglected of being away from the mainstream of the benefits of towns. Sources of earning are meagre and seasonal. They have no desire to protect the nature and wildlife. Being the foremost line in touch with wildlife of the area getting their support is critical for any protection measure launched for the benefit of protection of nature and wildlife. With this in mind the state government of Madhya Pradesh made Rules for promoting ecotourism in forest areas. Entry into forest areas is regulated and permitted by a legal provision so people residing around forest areas can benefit economically by protecting wildlife and conserving the beauty of natural areas in which they live. The Madhya Pradesh Forest and Wildlife (Recreation and Wildlife Experience) Rules 2015 provides the legal basis for tourism in forest areas. The uniqueness of the site can be a source of providing a source of income to the people who reside in or around the forest area. Locals will be uplifted economically and consequently have a stake in continued protection and development of the natural resource. World over there have been many instances of a specific animal or beauty of a site that has drawn tourists. These sites have contributed immensely to local welfare and the local people have ensured the survival of the site or animal so that they can have a continuous source of income. India, with a continued rising population with rising expectations of the people needs more space which inherently comes from encroaching into forest land.

Names and affiliations: Sneha Ramani, Assistant Professor, Nirma University, Ahmedabad

Title of presentation/panel/round table discussion: Seeing the unseen: Rediscovering the identity of Okhamandal beyond the cultural manifestations

Format: Oral presentation

ABSTRACT: The perception of landscape or setting changes drastically when viewed from the eye of a traveler, a tourist, a spectator and a flâneur. These perceptions are the result of what the person, when embodied in different roles wants to look at; for instance the perception of a tourist while looking at a landscape are limited to his end-destination, while for a traveler the idea of path is more important. On the contrary, for a spectator or an observer, the idea of moving through the landscape lies in the details, and for a flâneur the idea of traveling revolves around a more humanistic approach of observing societies and culture. Amongst all these perceptions of the path taken by a human being, it is the landscape setting and the relationship to the built that mold, change and accommodates what a person sees and doesn't see or "un-sees". The idea of this study is to understand this facet of unseen within a landscape setting, why the perception of humans gets limited only to the "known" identities of a setting.

The setting chosen for the study is Okhamandal, dictated and identified by its association with the myths and stories of Krishna and is also identified as one of the "chardham" hence being a part of the larger tourist network. Upon visiting the setting one gets hit by the evident identity of the region and the presence of Krishna; this is ingrained in the landscape by the tourist route that flows through the setting. But, as one breaks apart this network and sees beyond the built or cultural identity, one gets introduced and starts defining this new identity of the setting.

Names and affiliations: Gopaul Noojibail, Acting Superintendent, Grand Teton National Park, US National Park Service, US Department of the Interior

Title of presentation/panel/round table discussion: Increasing Cultural Awareness of International Visitors in U.S. National Parks

Format: Oral presentation

ABSTRACT: The National Park Service is a leader in fostering cultural awareness through the stories it shares and the places it preserves. U.S. National Parks are an increasingly attractive destination for overseas visitors. U.S. travel economists predict the share of international visitors coming to U.S. National Parks to steadily increase. These visitors provide a significant economic boost to the American tourism industry and gateway communities in the summer months. International visitors are warmly welcomed, although language and cultural differences can be a challenge for park managers and gateway communities. Examples range from international visitors approaching dangerous wildlife, wayfinding in the outdoors, and awareness of Western restroom etiquette. Grand Teton National Park, located in northwest Wyoming, has seen a significant increase in Chinese tourism over the past five years and has worked hard to successfully promote environmental stewardship and safety messages. The park has numerous volunteers that share awareness and education to assist all visitors with an opportunity for a high quality wildlife and recreational experiences. As the middle class in countries such as China and India continue to grow, and as international visitation increases overall, the U.S. National Park Service is interested in enhancing cultural and safety awareness before and after international visitors arrive. The park also works cooperatively with gateway communities to increase cultural knowledge that helps to provide an exceptional visit for our international visitors. Park managers are also interested in how to connect visitors with environmental ethics associated with national parks so that they can take them home to their own protected areas.

Balancing tourism and conservation goals: Governance of Natural Resources with Ecotourism Benefits

Names and affiliations: QIAN Liyuan, ZHOU Sixiang (corresponding author), LEI Dong

Title of presentation/panel/round table discussion: Assessment of Ecological Carrying Capacity along the Hiking Crossing Route of the Gongga Mountain Nature Reserve

Format: Oral presentation

ABSTRACT: The assessment mechanism for ecological carrying capacity of global nature reserves is incomplete, which makes it difficult to define the extent to which destroyed reserve area should be closed. It has become an urgent problem to be solved in China's ecologically endangered nature reserve areas such as Gongga Mountain Nature Reserve and Nianbao Yuze National Park. Every October during China's National Day holiday, nearly a thousand people will hike through the crossing route of the Gongga Mountain Nature Reserve. Due to the frequent bad weather in recent years, a large number of hikers have been accidentally stranded, causing irreversible pollution to the ecological environment along the water source, animal and plant habitats and original villages, which directly threatens the core area of the reserve area. This presentation will be based on the ecological environment within 1 km of the radiation zone on both sides of the hiking crossing route of the Gongga Mountain Nature Reserve in the Sichuan West Plateau of China, with landscape patterns (vegetation patch, original village patch, hydrological corridors, wildlife migration corridors, etc.) as research factors. During the National Day holiday in October for the last 15 years, the dynamic simulation models of ecological carrying capacity (animal and plant habitats, original villages) will be constructed by applying HD Remote sensing infrared image analysis, remote infrared camera monitoring, and several sets of environmental index modeling software. Through analysis and evaluation of the coupling degree of time series, the long-term complete ecological carrying capacity risk assessment and risk control strategy platform can be established for the Gongga Mountain Nature Reserve along the hiking crossing route.

Names and affiliations: Ashwika Kapur

Title of presentation/panel/round table discussion: India's Forest Guards - the real heroes of conservation.

Format: Oral presentation

ABSTRACT: As wildlife filmmakers we go out into the most spectacular locations and film the rarest and most charismatic animals to stun and amaze audiences with mesmerizing images. But while getting those “money shots,” we often forget something very important. What we film exists today only due to the tireless efforts of a few special people. Who are they and what’s their story? Since most wildlife filmmaking is species-oriented, rarely does one get a chance to look behind the scenes. This invaluable opportunity came along for young, nature-filmmaker Ashwika Kapur, when she was asked to leave her camera behind and instead present on-screen a 6-part Conservation Series for Animal Planet on India’s Forest Guards. With only about 5 years of professional involvement in the Natural History Film Industry, Ashwika had already had several exciting experiences. Her first film on a Kakapo in New Zealand won her the Green Oscar. Subsequently she filmed across the country for Discovery Channel’s Wild India. Later she got to work on location with her ultimate hero Sir David Attenborough. Yet, spending 6 months completely submerged in the work and lives of the people that save India’s wild, taught her a lot more about conservation and gave her an insight that has changed her for life. In this session, Ashwika will talk on everything she learnt from first-time experience of the work of India’s brave and committed forest guards. She will highlight the challenges they face, the wisdom they have to offer, and what needs to be done to give them a better quality of life. Focused entirely on the forest guards, this session promises to be full of passion, heart, and gratitude, told from the fresh point of view of a young nature storyteller.

Names and affiliations: Rohit Singh (WWF International, Singapore), Mike Belecky (WWF, Singapore), William Moreto (University of Central Florida USA)

Title of presentation/panel/round table discussion: Life on the Front-line

Format: Oral presentation

ABSTRACT: Rangers are charged with preventing biodiversity loss and ecosystem degradation. They work across the great diversity of environments and landscapes of our planet. They also function under an equally diverse range of working conditions – with salary, training, healthcare, job stresses and other factors that promote or inhibit the welfare of these men and women being highly variable. To this point, there has been very little information on the working conditions of rangers, which is problematic in that such an evidence-base is needed to effectively lobby key stakeholders and decision-makers towards improving ranger welfare and effectiveness. The presentation will share results from the largest ever survey done on rangers with more than 7000 comprehensive surveys (197 questions on a wide variety of topics) returned from rangers working across 30 of the world's most biodiverse countries. The surveys are methodologically sound, with major contributions from leading social science departments (e.g. University of Central Florida) and relevant specialized agencies (e.g. International Labour Organization). The survey identifies three major thematic gaps for rangers; health & safety, capacity & equipment and trust deficit between rangers and communities.

Names and affiliations: Vivek Belhekar (University of Mumbai), Nupur Bhawe (University of Mumbai), Prachi Paranjpye (Wildlife Conservation Trust)

Title of presentation/panel/round table discussion: Tourism, Conflict and Rehabilitation: Psychological aspects emerging from governance of natural habitats

Format: Oral presentation

ABSTRACT: The population density of India has resulted in large numbers of people being directly dependent on the forests. This poses a serious economic challenge for conservation. Several studies focus on the macro economic benefits of tourism initiatives in protected areas. Relatively little literature focuses on the differential psychosocial impact of the implementation of these policies. In this paper we purposively sampled three villages around the Tadoba Andhari Tiger Reserve each with a different economic relationship with the forest. The first one owns and operates tourism in a part of the reserve, another received state aid for voluntarily relocating away from the critical wildlife habitat and the third one had no stake in tourism but has direct dependence on the forest for meeting its energy needs and also faces severe human-wildlife conflict. The tourism village is a direct stakeholder and receives direct economic benefit from the tiger reserve. They acknowledge the transformative role played by the forest in their economic well-being. The families from the rehabilitated village received benefits amounting to one million Indian rupees and a marked increase in access to modern amenities. The relocated villagers express regret over missing social space and the lack of architectural and social proximity post rehabilitation. The third village reported a negative attitude towards the forest department and a complete lack of employment. They complained of having to pay the cost of conservation for the benefit to tourism villages.

Roundtable Discussion: Tourism and Conservation: Defining Priorities

Names and affiliations: Rohit Gangwal (Raksha Foundation)

Title of presentation/panel/round table discussion: Tourism and Conservation: Defining priorities

Format: Round table discussion proposal

ABSTRACT: Given the strength of consumer demand for “ecotourism” and dramatic growth forecasts for this sector of the world's largest industry, it is not surprising that some governments are now beginning to develop national ecotourism strategies. Tourism can help in conservation in a lot of ways. Safari jeeps regularly patrol the forest, monitor illegal tree felling and cattle grazing which results in faster and autonomous jungle growth. Tourists also help in data collection by regular sighting and photographic documentation of animals, which otherwise would have had a huge cost burden. Tourism also enhances public interface and spreading awareness on conservation. Profits made by ecotourism ventures are being used in conservation programs, initiation of programs like Seed Dispersal- which has a two way impact where the local communities are being involved in conservation, giving them a feeling of belongingness and connectivity; on the other hand it also leads towards the betterment of our environment. Increasing rates of tourism is both a boon and bane for our society; on one side where it creates more employment opportunities on the other it can have an adverse impact on the environment. There has to be a check on tourism activities and sustainable activities should be entertained. Number of vehicles should be restricted; safari should not operate 24 hours; sound and pollution free E- vehicles should be used instead of Gypsies; having more plantation drives; more community participation through launching drives like plastic removal programs. The forest department has to employ more staff in order to ensure smooth functioning and the safety of visiting tourists which is an extra cost to be borne by the department. Sustainable tourism is the key to park survival.

Protecting Vanishing Resources and Experiences

Names and affiliations: Dr. Jeffrey Hallo (Clemson University, USA), Dr. Robert G. Dvorak (Central Michigan University, USA)

Title of presentation/panel/round table discussion: The 'endangered' polar bear viewing experience in the Arctic: A discussion of science-based visitor management

Format: Oral presentation

ABSTRACT: The waters in the Arctic National Wildlife Refuge are the premier place in the U.S. to reliably view polar bears. The listing of the polar bear in the U.S. as a threatened species and the well-publicized influence of climate change seem to be markedly increasing demand by the public to view this iconic symbol of the Arctic ecosystem. Over the past several years, commercially guided, water-based polar bear viewing has rapidly increased at the Refuge. Viewing occurs in the context of the Inupiat village of Kaktovik, AK, where Alaska Natives continue rich cultural traditions and subsistence hunting practices. Too many visitors may cause unacceptable impacts to fragile arctic resources, change the rich Inupiat culture, and degrade the quality of the polar bear viewing experience and its potential conservation outcomes. The authors will present and discuss summaries of multiple social science efforts to inform a visitor management plan for water-based polar bear viewing. Visitor surveys employing normative methods and photo simulations were used to determine experiential thresholds for indicators of the viewing experience. Visitor motivations, issues, and attitudes towards management alternatives were also examined. Results from these efforts indicate the range of management strategies acceptable to visitors and suggest experiential thresholds for 1) proximity to a polar bear and 2) number of boats gathered around a polar bear. They also highlight visitor perspectives of the impacts of ecotourism on the local community and conservation outcomes.

Names and affiliations: Dr. Robert G. Dvorak (Central Michigan University, USA), Dr. Jeffrey Hallo (Clemson University, USA)

Title of presentation/panel/round table discussion: Indigenous communities, “last chance tourism”, and collaborative management in the Arctic.

Format: Oral presentation

ABSTRACT: Global climate change is having indisputable consequences to protected areas and fragile ecosystems. In the Arctic ecosystem, the polar bear (*Ursus maritimus*) is an iconic symbol of wildness with cultural and ecological significance threatened by climate change. Given this significance, it is not surprising that there is demand to view and experience these unique creatures. Over the past several years, commercially guided polar bear viewing has rapidly increased at locations across the world that can offer consistent and reliable ecotourism opportunities. These instances of “last chance tourism” can be described as travel to impact-sensitive and imperiled destinations where visitors seek vanishing landscapes and/or disappearing natural and cultural heritage. However, these increases in visitation can have impacts on fragile resources and change the rich culture of indigenous communities embedded across these landscapes. These landscapes are also threatened by external forces such as renewed interest in oil and gas exploration. Therefore, science-based, collaborative management is necessary to meet these challenges and protect critical ecological and cultural resources. The purpose of this presentation is to discuss the challenges, strategies, and opportunities for collaboration in managing “last chance tourism” in protected areas. It uses the case of polar bear viewing in the Arctic National Wildlife Refuge, where viewing occurs in the context of the Inupiat village of Kaktovik, AK. The presentation will address the competing and shared values among federal agencies, commercial tour operators, local indigenous communities, and non-governmental organizations.

Names and affiliations: Tina Tin (Antarctic and Southern Ocean Coalition), John Peden (Georgia Southern University), Jessica O'Reilly (Indian University), Kees Bastmeijer (Tilburg University), Pat Maher (Cape Breton University)

Title of presentation/panel/round table discussion: Preservation Amenity, Research Laboratory, or Mineral Reserve? International Perspectives on the Values of Antarctica

Format: Oral presentation

ABSTRACT: Between 2007 and 2013, we interviewed and surveyed over 1,000 people from mostly Europe and North America about their perceptions of Antarctic wilderness. Most participants have low levels of knowledge about Antarctica, and relied on their cultural understandings of wilderness to conceptualize the Antarctic wilderness. Participants consistently valued Antarctica as one of the world's last great wildernesses, an important component of the Earth's climate system, and a science laboratory for the benefit of mankind. An overwhelming majority supported designating Antarctica as a wilderness reserve where development of infrastructure is limited. Among university students, biological sciences and natural resources / conservation majors were more likely than business and economic majors to support wilderness designation and less likely to support mineral resource development, while nationality was not significantly associated with support for construction of new research stations and mineral resource development. Two surveys conducted at the same university indicated that students in 2007 were statistically significantly more supportive of wilderness and less supportive of mineral resources than students in 2013.

Names and affiliations: Vicki Sahanatien (Iqaluit, Nunavut, Canada)

Title of presentation/panel/round table discussion: The Arctic Triangle: Canada's Network of Wilderness Areas

Format: Oral presentation

ABSTRACT: In 2019, marine conservation leapt ahead in the Canadian Arctic with the creation of Tuviajuittuq Marine Protected Area and Tallurutiup Imanga National Marine Conservation Area. Their oceanic arms wrap around Quttinirpaaq and Sirmilik National Parks, creating the largest contiguous marine-terrestrial protected areas in Canada at 357,000 km² and 130,000 km². These vast arctic wilderness areas join existing national parks (7), territorial parks (2), marine protected areas (2), migratory bird sanctuaries (13), and national wildlife areas (5) to establish a longitudinal and latitudinal network for protecting arctic biodiversity and long-term research and monitoring. This spatial and empirical analysis will summarize the biophysical values protected, examine the potential connectivity between protected areas, and evaluate Canada's contribution to global arctic conservation.

Roundtable Discussion: Disappearing Wildernesses of Ice: a Roundtable Discussion Focused on Glaciers, Ice, Wilderness and Climate Change

Names and affiliations: Chris Dunn (University of Colorado-Boulder)

Title of presentation/panel/round table discussion: Disappearing Wildernesses of Ice: A Roundtable Discussion focused on Glaciers, Ice, Wilderness, and Climate Change

ABSTRACT: Climate change will significantly impact wilderness and protected areas in many ways, especially Arctic and high alpine environments, which contain some of the largest protected areas on the planet. In this roundtable, I would like to focus specifically on wilderness areas that contain, or are near, significant ice features, including glaciers, ice sheets, or marine ice. This is inspired by a recent report, stating that “60 percent of total glacial mass volume within world heritage glaciers will be lost by 2100. Additionally, 21 of the 46 sites examined in the study will likely suffer from complete glacial extinction. Glacial loss of this magnitude would likely threaten the integrity of ecosystems, alter large-scale hydrology, and reduce species’ diversity.”

(<https://gcc02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fglacierhub.org%2F2019%2F05%2F30%2Funesco-glaciers%2F&data=02%7C01%7C%7C6ab6fead9336432122ad08d71f53a810%7Ced5b36e701ee4ebc867ee03cfa0d4697%7C0%7C1%7C637012316469954539&sdata=cjGGGYAKaCbdVRPeQc7Od2zdV1rV9ToNLNDVpKcfkfg%3D&reserved=0>).

Some topics that WILL be discussed include:

- What special challenges and opportunities do glaciated landscapes present for conservation? Especially in the context of climate change.
- How is ice a part of wilderness character and how will its loss affect wilderness character?
- What are the impacts of ice loss on wildlife and people?
- How will receding glaciers and sea ice create new pressures on arctic and high alpine protected areas, e.g. the opening of the Northwest Passage to cruise ships and development?
- What can we learn from the oral traditions of indigenous peoples with long histories in these regions, including adapting through similar rapid, profound changes in the past?

Social-Ecological Systems, Unbounded Meanings

Names and affiliations: YU Wei (Beijing Forestry University), LI Gang (Beijing Forestry University), SIYUAN He (Institute of Geographic Sciences and Natural Resources Research), XHEN Xutu (Planning and Design Institute of Forest Products Industry, State Forestry and Grassland Administration, China), LEI Guangchun (Beijing Forestry University), YANG Su (Management World Press Affiliated to the Development Research Center of the State Council, Beijing)

Title of presentation/panel/round table discussion: Beyond protected areas: Identifying Nature-Community Nexuses for improving integrated management in Social-Ecological Systems

Format: Oral presentation

ABSTRACT: Contemporary science declares that “nature needs half” to end the biodiversity crisis, while human activities have become more and more intertwined with nature, leaving most areas as social-ecological systems instead of wilderness areas. When protected areas are being expanded, Nature-Community Nexuses (NCN) also need attention in enhancing conservation value and ecological integrity. In such regions, restoring ecosystem services is one of the efficient ways to balance natural conservation and community development. This study proposed a general theoretical framework for building inter-linkage network among protected areas, and revealed two types of Nature-Community Nexus (NCN) from Qianjiangyuan National Park Pilot Area, a typical social-ecological system located in eastern China, as a case study. Three selected water regulation services were included in the quantitative analysis. Results shown that the proportions of cropland and orchard areas have a significant, negative correlation with water and soil retention services respectively, while forests are significantly beneficial for both services. The income proportions of primary, secondary, and tertiary industries have complicated correlations with different livelihood assets.

Names and affiliations: TAO Nan (Tongji University, China), Zhuang Xiaoping (Wuhan University, China), JIN Yunfeng (Tongji University, China)

Title of presentation/panel/round table discussion: Response to Industrialization and National Cultural Core: Origin and Essence of Wilderness Landscape under the Concept of Romanticism

Format: Oral presentation

ABSTRACT: From the late 18th century to the early 19th century, during the rapid transformation from the picturesque landscape of Enlightenment Age to the concept of romanticism, wilderness landscape was the symbol of romanticism landscape, which represented not only evolution of nature of landscape aesthetics, but also transitions of social philosophy and social context. This research analyses the originating reasons of British wilderness landscape and its developing history when it spread to the United States under the concept of romanticism. The research discovers that there are two connecting points between essence of wilderness landscape and its underlying social context. Firstly, in the late 18th century, British wilderness landscape was an extension of European idyllic pastoral, a reexamination of the relationship between human and nature under romanticism, and a response to the national industrialization and urbanization. Secondly, in the early 19th century, wilderness landscape was an idealistic portrait of the western United States. Romanticism gave special meanings to the wilds of the United States, and it was reckoned as a precious condensed cultural heritage, promoting the agreement of national cultural identity. Therefore, the historical research of origin and implication of wilderness landscape is of great importance in promoting the spirit of wilderness landscape and encouraging the protection of wilderness landscapes at present.

Names and affiliations: LIU Binyi, (Tongji University), Alayi Abuduaili, (Tongji University, Xinjiang Agricultural University)

Title of presentation/panel/round table discussion: A Preliminary Study of the Value of Wilderness Spirit: An Example of the Wilderness View of Chinese Traditional Grassland Nomads

Format: Oral presentation

ABSTRACT: The wilderness has rich spiritual values. The traditional Chinese grassland nomads are the typical carriers that inherit and convey the spirit of the grassland wilderness. This study refines background characteristics of grassland wilderness, analyses the influence of grassland wilderness on the human settlement activities and construction of three typical grassland nomadic peoples in Mongolian, Tibetan and Kazakh, based on the trilisim theory of human settlements. The study concludes that the wilderness spirit results in the wilderness view, the wilderness view guides the human behavior, finally, the human behavior activity feedback acts on the wilderness to protect the wilderness. That is, the "Wilderness→Wilderness Spirit→Wilderness View→Wilderness Activities→Wilderness" is the wilderness self-development protection mechanism centered on the wilderness spirit and its enlightenment on the construction of human settlements.

Names and affiliations: CHEN Wangheng, LI Xiaoxiang (Wuhan University)

Title of presentation/panel/round table discussion: Wilderness Consciousness in Ancient China

Format: Oral presentation

ABSTRACT: Chinese traditional culture, which was built mostly on an agricultural civilization, does not pay attention to the wilderness. The wilderness awareness has never become a cultural form independently. It often emerges with some important culture forms, becomes the background or component of them. These cultures are: Firstly, the Culture of Ancestors. The book *Shan Hai Jing* is the representative of this culture. It records the distribution of mountains in China. Half of them are real and other half are myth. Secondly, the Culture of Dynasties. The book *Mu Tian Zi Zhuan* is the representative of this culture. It records the story of king Zhou Mu Wang's visit to the west of his kingdom. His route included the area of West Asia, far beyond the border of modern China. Thirdly, the Culture of Science. The culture of science that related to the wilderness is mainly geography, hydrology and mining, etc. Books like *Yu Gong*, *Notes on Book of Waterways*, *Heavenly Creations*, and *Travels of Xu Xiake* are associated with it. In descriptions of the wilderness in those books, they try to express two ideas: (1) The wilderness is an important natural phenomenon, it is the natural environment that cannot be ignored or avoided; (2) There exists valuable resources in the wilderness. Fourthly, Feng Shui of Residence. There are two types of Fengshui in China: Yangzhai Fengshui and Yinzhai Fengshui. The theories of these two types are similar, but still have great difference. Generally speaking, Yinzhai for dead people are preferred to be located in the wilderness, on the other hand, Yangzhai for living person refuse the wilderness.

An emerging wilderness consciousness based on an ancient relationship between humans and nature

Names and affiliations: Thierry Lefebvre (IUCN French Committee)

Title of presentation/panel/round table discussion: Towards a new "wilderness culture" in Europe?

Format: Oral presentation

ABSTRACT: Established in 2014, the Wilderness and Feral Nature working group of the International Union for Conservation of Nature French committee aims to conserve free evolution natural areas in France. This return of the wild is arousing renewed scientific interest from the point of view of conservation biology, while raising ethical, social and economic issues. A monthly seminar was organized between 2018 and 2019, with a total of more than 30 experts in social sciences who have carried out studies in France and other countries on wilderness uses and perceptions, analyzing factors of its negative perception, conditions of its appropriation, in order to reflect on the conditions of possibility of a "new wilderness culture" in France and more broadly in Europe.

For the first time, the presentation will summarize the main conclusions of this work, which focused on five themes :

- Comparative approaches of wilderness perception (at European scale)
- New sociabilities induced by cohabitation with wild species
- Historical figures of the wild, from threat to protection
- Transformative dynamics of the wilderness experience
- Marginalized and rewilded areas in search of new uses

A discussion will be opened on the follow-up of this work on conditions of appropriation of wild and rewilded areas, in particular by carrying out field surveys and launching research projects in Europe.

Names and affiliations: Tina Tin (Antarctic and Southern Ocean Coalition), River Yang (Montessori Plus International)

Title of presentation/panel/round table discussion: Wilderness or Pure Land: Tourists' Perceptions of Antarctica

Format: Oral presentation

ABSTRACT: The overwhelming majority of tourists to Antarctica come from the USA and Europe. However, the number of Antarctic tourists coming from China has grown from only 17 in 2010–11 to over 3000 in 2014–15, representing over 10% of the total annual number of Antarctic tourists. In a survey of 222 cruise passengers to the Antarctic Peninsula in 2013, nearly 90% of the respondents valued Antarctica as one of the world's last great wildernesses. Tourists from Europe and the USA were more likely than those from China to value Antarctica as wilderness. In the Chinese language, there are no exact equivalents of the word "wilderness." In modern Chinese, "wilderness" is commonly translated as huāng yě (荒野). Huāng (荒) and yě (野) can be considered as synonyms, indicating places where plants and animals are not cultivated by humans. This has been extended to include places that have not been subject to human influence. Since land that has not been tamed by humans may threaten human survival, huāng yě has also adopted a connotation of being savage, violent, and dangerous. Kuàng yě (旷野) and mán huāng (蛮荒) are also sometimes used, conveying additional connotations of vastness and spaciousness (kuàng 旷) and being savage and uncivilized (mán 蛮). Among our survey respondents, Europeans perceived wilderness as remote, Chinese perceived it as desolate, and Americans valued the psycho-spiritual benefits of being in wilderness. Respondents' wilderness perceptions were nourished by icons of wilderness, mostly from their home countries but also from international destinations. Instead of wilderness, Chinese respondents were more at ease at referring to Antarctica as "pure land", which is also the name of a branch of Buddhism popular in Asia and is often understood as the land of bliss or enlightenment.

Names and affiliations: Chris Dunn, PhD Candidate University of Colorado--Boulder,

Title of presentation/panel/round table discussion: A Philosophical Consideration of the Spiritual and Cultural Values of Wilderness in Light of Indigenous Conceptions of Place

Format: Oral presentation

ABSTRACT: It has been argued that the idea of wilderness and its legal expression, typified by the U.S. Wilderness Act, is theoretically and practically flawed, especially in a developing-world context. Yet, wilderness as an idea and a form of protection continues to spread in popularity and land-mass throughout the globe. This may seem on its surface, if wilderness is understood to be a place without culture, to contradict recent movements towards bridging gaps between nature and culture, as reflected in the IUCN's recent Hawaii Commitments. The focus of this paper is on one of these commitments, which calls for "linking spirituality, religion, culture, and conservation."

In light of these debates, trends, and commitments, this paper will present a comparative consideration of cultural conservation values, especially between Indigenous and "Western" understandings of nature, including parks and wilderness. In other words, a philosophical analysis of differences and commonalities in the spiritual values of Western wilderness and Indigenous conceptions. This speaks to a vibrant and ongoing debate taking place in multiple fields. This paper will offer an important perspective that may contribute towards the culture-nature journey, but is not intended to fully engage with debates on the applicability and philosophical underpinnings of wilderness.

Names and affiliations: Dr. Nancy Shea (Mountainside Institute, University of Wyoming)

Title of presentation/panel/round table discussion: Finding One's Own Wild Ethic

Format: Oral presentation

ABSTRACT: The Wild Ethic is a way, a practice to deepen our engagement with life, with the wild, with the more than human and with our own capacity to reveal our participatory nature. We need a way that expands our sense of self so that we see ourselves as essential participants with others in the fabric of life. With attitude and eagerness comes the desire to act. But prior to action, we need alignment or knowledge. This is the skillful means for taking action. It is the step that bridges our initiatives and goals with our own inner alertness. Alignment makes action personal. When action is personal, it has staying power and the authenticity of true effectiveness. This notion of right alignment is often overlooked in our eagerness to make change happen. The precepts of The Wild Ethic are tools for engagement. Aligning to our intention ensures that our actions will help us change inside as much as changing the outside. We will manifest who we are. Finding practical ways to match behavior to values, or finding a deeper way to be present, helps us not jump to solutions. Action without proper alignment can be short-lived, even hurtful, and it often misses the target. Doing this presentation we will explore what it takes to create one's own Wild Ethic. What are the skills and knowledge of right alignment that will carry our intentions into the world? When we take the time to practice alignment, we turn toward humility. The skills that we develop open us to new ways of participation, free us from our more typical outward strategies that achieve goals but can disappoint as they fail to embody and reflect our love for the wild.

Panel: For the Love of One Elephant

Names and affiliations: Joan Berning | Ian Michler (South Africa) | Andrew Muir (Wilderness Foundation of South Africa)

Title of presentation/panel/round table discussion: For the Love of One Elephant.

Format: Panel of speakers

ABSTRACT: In the Southern Afrotropical Forest, on the Southern Coast of South Africa lives one elephant. This is no ordinary elephant as it is the last free-roaming Elephant remaining from herds that once roamed South Africa and the area between Eden and Addo. Unfenced, the elephant is free to migrate, but due to fragmentation of the landscape over the last 200 years, it remains hidden in the forest, seldom seen. What have we done that over 2000 elephants in this area were reduced to just one in 200 years? This is the symbol on which Eden to Addo has built its Corridor Initiative. Reducing wildlife to smaller and smaller habitat fragments, imprisoned by human activity, the dream arose - what if the elephants from the Addo Elephant Park, 400km away, could re-connect with the lonely matriarch. All effort is now focused on the remaining wildlife within the corridor ensuring that the same fate does not befall species lower on the rung of this keystone species. Between Eden and Addo we have the advantage of a diversity of biomes found nowhere else in the world, three mega reserves of which two are unfenced, and free roaming species such as black rhino, buffalo, mountain zebra, leopard and more that require large landscapes. Eden to Addo is connecting three mega reserves by means of natural corridors on private land. Fences are taken down and protected areas connected. And here we step into new territory creating short term discord for long term sustainability.

Threats to connectivity from environmental change and development: Part 1. Connectivity and the Uncertainty of Climate Change

Names and affiliations: Lisa Holsinger (Aldo Leopold Wilderness Research Institute, Rocky Mountain Research Station, USDA Forest Service, USA), Sean Parks (Aldo Leopold Wilderness Research Institute, Rocky Mountain Research Station, USDA Forest Service, USA), Marc-André Parisien (Northern Forestry Centre, Canadian Forest Service, Natural Resources Canada, Canada), Carol Miller (Aldo Leopold Wilderness Research Institute, Rocky Mountain Research Station, USDA Forest Service, USA), Enric Batllori (Centre for Ecological Research and Forestry Applications, Autonomous University of Barcelona, Spain), Max A. Moritz (University of California Cooperative Extension and Bren School of Environmental Science and Management, University of California Santa Barbara)

Title of presentation/panel/round table discussion: Climate change to potentially reshape vegetation in North America's largest protected areas

Format: Oral presentation

ABSTRACT: Climate change poses a serious threat to biodiversity and unprecedented challenges to the preservation and protection of natural landscapes. We evaluated how climate change might affect vegetation in 22 of the largest and most iconic protected area complexes across North America. We use a climate analog model to estimate how dominant vegetation types might shift under mid- (2041-2070) and late-century (2071-2100) climate according to the RCP 8.5 scenario. Maps depicting vegetation for each PA and time period are provided. Our analysis suggests that half (11 of 22) of the protected areas may have substantially different vegetation by late-21st century compared to reference period conditions. The overall trend is towards vegetation associated with warmer or drier climates (or both), with near complete losses of alpine communities at the highest elevations and high latitudes. At low elevation and latitudes, vegetation communities associated with novel climate conditions may assemble in protected areas. These potential shifts, contractions, and expansions in vegetation portray the possible trends across landscapes that are of great concern for conservation, as such changes imply cascading ecological responses for associated flora and fauna. Our approach would be useful for application in other protected areas across the world for envisioning potential future vegetation distributions, and can highlight for managers the challenges faced to maintain and conserve biodiversity towards building nature-based solutions in key protected areas across the planet.

Names and affiliations: LIU Xincen (Southwest Forestry University, China), LIU Chang (Southwest Forestry University, China), ZHOU Li (Southwest Forestry University, China), SU Xiaoyi (Southwest Forestry University, China)

Title of presentation/panel/round table discussion: Spatial Distribution Characteristics of Microclimate and Effect of Stewardship in Karst Wetland Nature Reserve

Format: Round table discussion proposal (changed to oral presentation through correspondence)

ABSTRACT: Located in Qiubei County of Yunnan Province, China, the Puzhehei Nature Reserve has the geological combination of Karst peak forest and wetland. Through videos, images and Landsat data in 2009 and 2019, this thesis studies the woodlands, brushwood, waters, farmlands, uncultivated lands, and residential areas of the Puzhehei Natural Reserve, and analyzes the spatial distribution characteristics of land surface temperature variation. The correlation coefficient between the land surface temperature retrieved from the thermal infrared band received by the TIRS sensor of Landsat in 2019 and the actual measured land surface temperature of the year is 0.79. On the basis of these data, we retrieve the land surface temperature image of the Puzhehei Nature Reserve of 2009 and 2019, and interpret the distribution of 6 spatial types. Different spatial types are closely related to the microclimate. The woodlands and waters enjoy the best microclimate stability and quality, which are followed by the brushwood and farmlands; while the microclimate quality of the uncovered rocks and residential areas is the worst. There is a significant positive correlation between the surface vegetation coverage and the land surface temperature. Compared to 2009, the area of woodlands and waters in 2019 was increased remarkably, and the average land surface temperature declines, i.e. through planning and management, the overall ecological environment of the nature reserve has been improved, and the micro-climatic effect is more significant.

Names and affiliations: Neha Verma (Uttarakhand Forest Department), Amit Verma (Uttarakhand Forest Department)

Title of presentation/panel/round table discussion: Priority Conservation Area: The missing link between Protected Areas and Managed Forests in Landscape Level approach of biodiversity conservation

Format: Oral presentation

ABSTRACT: In India, Protected Areas (PA) are islands of conservation which are dedicated to and managed for wildlife conservation, nearly excluding all forms of exogenous resource sharing, be it with the commercial market or with the fringe communities. Managed Forests (MF), on other hand, primarily focus on sustainable exploitation of forests while recognizing the rights of fringe communities while usually neglecting the interests of wildlife resulting in most of the wildlife conservation activities being carried out on an ad-hoc basis without proper long term monitoring and planning. This PA-centric approach of conservation in India is unsustainable in the long run as only 5.02% of total country's area is designated as PA and thus burdening small areas with huge expectations of saving enormous biodiversity of India, including megafauna with large home range and multiple site resource use. Considering a landscape-level approach as an alternative to ensure the sustainability of conservation efforts, it is imperative to realize the importance of Managed Forests as they convert islands of PAs into contiguous landscapes, provide connectivity in conservation landscape through wildlife corridors, provide extended habitats and dispersal areas adjacent to PAs for widely distributed species, often support breeding population of flagship species and act as repository of biodiversity. Thus to provide this missing link, this study brings in a concept of 'Priority Conservation Area' (PCA), to ensure conservation of biodiversity and protection of environmental values and services.

Names and affiliations: Sean Parks (Aldo Leopold Wilderness Research Institute, USDA Forest Service), Carlos Carroll (Klamath Center for Conservation Research), Solomon Dobrowski (University of Montana)

Title of presentation/panel/round table discussion: Human land uses reduce climate connectivity among protected areas

Format: Oral presentation

ABSTRACT: Climate connectivity, the ability of a landscape to promote or hinder the movement of organisms in response to a changing climate, is contingent on multiple factors including the distance organisms need to move to track suitable climate and the resistance they experience along such routes. However, evaluations of climate connectivity rarely consider human land uses that may alter movement routes and increase resistance to movement and thus potentially reduce climate connectivity. Here we evaluate climate connectivity among North American protected areas and consider both climate and human land uses as factors that may impede the movement of organisms. Results show that climate connectivity decreases among protected areas of North America when incorporating human land uses. Both climate velocity and climate exposure increased for a large proportion of the continent. Moreover, about 95% of movement routes in North America must contend with human land uses to some degree as they shift in response to climate change. Overall, this study indicates that current evaluations of climate connectivity that do not account for human impacts underestimate climate change exposure. Although our study was conducted in North America, our findings have important conservation implications for other continents and regions across the globe, such as Europe and southern Asia, where human densities are often higher and human land uses are more widespread. Climate connectivity among protected areas is substantially reduced in regions highly modified by humans, and as such, the ability of organisms to shift their ranges in response to climate change is critically compromised. Providing adequate movement corridors among protected areas could be an option to help facilitate species movement under a warming climate.

Threats to connectivity from environmental change and development: Part 2. Connectivity and the Uncertainty of Climate Change

Names and affiliations: LUN Yin (Yunnan Academy of Social Sciences, Kunming, China), Misiani Zachary (Kenya Meteorological Department, Ministry of Environment and Forestry, Nairobi, Kenya)

Title of presentation/panel/round table discussion: Traditional knowledge in use of species and genetic resources for the Climate Change Adaptation of Tibetan People in Eastern Himalayas, China

Format: Oral presentation

ABSTRACT: The Eastern Himalayas in north-western Yunnan are hotspots for biodiversity and cultural diversity. In recent years, the effects of climate change including natural disasters have increasingly threatened the life of local Tibetan communities: agro-pastoral livelihoods, water, and the biodiversity resources people depend on, such as mountain pastures, valley and forest. Because of the fragility of the natural environment and the livelihood's deep dependence on these resources, these challenges have seriously threatened their sustainable development and livelihoods. Traditional knowledge in use of species and genetic resources refers to knowledge about domesticating, cultivating and using of cultivated plants or varieties and domesticated animal species or breeding varieties, and utilization of other biological resources and knowledge created and cultivated by the local community and its people through production and living process. This traditional knowledge mainly based on the exploit and utilization of biological resources and genetic resources, such as the local crop varieties, indigenous animal breeds, traditional fruit trees and flowers, and their preservation methodologies. Meadows distributed at different altitudes have rich and diverse grassland resources, which are natural grazing pasture. The local Tibetan herdsmen have formed rich traditional knowledge in production practice. In this paper, we will discuss the impacts of climate change and extreme climate events on pasture biodiversity and genetic resources based on traditional knowledge of forage resources utilization.

Author and affiliation: Narendran Kodandapani (Center for Advanced Spatial and Environmental Research, India), Sean A. Parks (Aldo Leopold Wilderness Research Institute, USDA Forest Service, Rocky Mountain Research Station, USA)

Title: Changing fire regimes, climate, and human drivers: A perspective from a protected area network and reserve forest in India

ABSTRACT: Protected areas in India provide forest habitat for several emblematic and charismatic species such as the Bengal tiger and the Asian elephant. In general, large mammalian herbivores are attracted towards recently burned forests. Fire is the preferred strategy to maintain these forests open, and tigers indirectly depend on fire-maintained habitats for ungulates as prey and unburnt areas for cover. Despite the conservation importance of fire-maintained forests in India, there is uncertainty regarding the degree to which annual climate variation influences fire activity. In this study, spanning about two decades, we evaluate wildland fire in two landscapes in the southern portion of the Western Ghats, one a protected area network (Nilgiris landscape) and the other substantially modified by human land uses (Uttara Kannada landscape). Both landscapes experienced higher annual area burned in the earlier decade analyzed (1996-2005) compared to the most recent decade (2006-2015). Furthermore, we found that annual area burned was correlated with annual climate variability in both landscapes, in that years with increased drought stress experienced more area burned. However, the correlations were weaker in the Nilgiris landscape than in the Uttara Kannada landscape, perhaps because of the role of humans in excluding fire through suppression practices. Although not the only factor influencing area burned, episodes of drought could exert an increasingly significant impact on wildfire activity under a warming climate both within and outside protected areas. India is witnessing an expanding human presence with accelerating land use change surrounding its forests and protected areas. Understanding the drivers of wildfire both within and outside protected areas along with the effects of fires in maintaining habitat heterogeneity could have implications for the conservation of the Bengal tiger and the Asian elephant in protected areas across the country.

Names and affiliations: Prachi Thatte, Coordinator, Connectivity Conservation, Species & Landscapes Division, WWF India

Title of presentation/panel/round table discussion: Connectivity Conservation through partnership: Coalition for Wildlife Corridors

Format: Oral presentation

ABSTRACT: Habitat destruction and fragmentation due to human footprint is increasing extinction risk of species globally. Maintaining connectivity is recognized as a key factor in conservation and management of endangered species. At times, critical connectivity provides means for adaptation to climate variability and extreme weather events. The Coalition for Wildlife Corridors (CWC) is intended to be an enduring collaboration of NGOs working for wildlife conservation using science and advocacy to identify, design, and effectively manage wildlife corridors across India. The vision driving the CWC is an India in which all major terrestrial and freshwater habitats in a region are connected in a way that enables wildlife mobility while sustaining economic development and without impinging upon existing social and cultural practices. Objectives of CWC would be to collaborate towards identifying, mapping and conserving corridors for wildlife species in India; forge regional/local partnerships and engagement for participatory corridor conservation and monitoring involving multiple stakeholders including NGOs, CBOs, government agencies and civil society; develop standardized methods for corridor monitoring, develop pilot studies on the ground, and build partnerships with the aspiration of growing to be able to address the objectives more wholly in years to come; facilitate and promote coordinated advocacy for corridor conservation and operationalize a web-based platform that facilitates all of the above objectives and actions.

Names and affiliations: Ian Michler (Invent Africa Safaris), Dr. Ian McCallum

Title of presentation/panel/round table discussion: Living in the Anthropocene: is this humanity's greatest challenge?

Format: Oral presentation

ABSTRACT: We live in a time that many define as the Anthropocene. So named because research shows our current living patterns are impacting the planet in such destructive ways that surviving this new epoch may well turn out to be humankind's greatest ever collective challenge. As a way of mitigating, we talk about 'living sustainably' to achieve growth, development goals and aspirations. But, what does this all mean, why are we not transitioning more effectively and, how realistic is this 'sustainability' process?

This presentation will outline the debate and address factors that help explain why we seem not to be transitioning despite what for many is an alarming situation. And then we will also look at some of the options we have to change the way we live. And in the end, are we not simply talking about a human condition? If so, what are the complexities of our behaviour and do we have any reason for hope? These issues will also be addressed.

Roundtable Discussion: Modernizing Approaches to Protected Area Designation and Stewardship in an Era of Rapid Change: How Do We Do It, Really?

Names and affiliations: Kevin McNamee (Director of Park Establishment, Parks Canada), Tamaini Snaith (Director of Conservation Programs, Parks Canada), Gilles Seutin (Chief Ecosystem Scientist, Parks Canada)

Title of presentation/panel/round table discussion: Modernizing approaches to protected area designation and stewardship in an era of rapid change: How do we do it, really?

Format: Round table discussion proposal

ABSTRACT: Protected area establishment and effective management are cornerstones of biodiversity and wilderness conservation. Globally significant progress has been made on establishing effective protected area networks. Yet, climate change, large-scale landscape and seascape changes (e.g., rapid urbanization, industrial development) and evolving societal values and socio-economic conditions are challenging us to think differently as we move forward to achieve increasingly ambitious protected area targets. This session will explore how protected area agencies, including Parks Canada, are currently approaching these issues; and it will engage the audience in round-table discussion to consider what else needs to be done to modernize our area-based conservation approaches. Three short presentations will set the stage. They will be followed by a world café session during which participants will engage in discussions around several key questions: Where should modern protected areas be, and how should they be managed to maximize resilience to climate change and large-scale land use changes? How can we best integrate new functions (e.g., carbon storage, provision of ecosystem services, lands for indigenous cultural and conservation leadership) in the establishment and management of protected areas? How can we maintain and enhance necessary connectivity in increasingly fragmented landscapes? How can we maximize synergies and conservation outcomes between the efforts of protected area agencies and Indigenous leadership? The focus will be on sharing real experiences and identifying tangible, practical actions that are most likely to lead to success.

Panel: Local voices, global tigers: discussions on human-wildlife relations, conservation and development in the Idu Mishmi of Arunachal Pradesh

Names and affiliations: Sahil Nijhawan (University College London, U.K.), Iho Mitapo (Dibang Adventures, Roing, Arunachal Pradesh, India), Achili Mihi (Dibang Adventures, Anini, Arunachal Pradesh, India), Aito Miwu (Anini, Arunachal Pradesh, India), Dr. Ambrika Aiyadurai

Title of presentation/panel/round table discussion: Local voices, global tigers: Discussions on human-wildlife relations, conservation and development in the Idu Mishmi of Arunachal Pradesh

Format: Panel of speakers

ABSTRACT: Wildlife conservation in India is marked by fervent debates between the proponents of 'exclusionary' conservation and those that support indigenous people's rights over forests and conservation. The recent litigation on the legality of the Forest Rights Act (FRA) is one such arena in which these philosophical battles are fought. The disagreements are particularly polarised in the case of tiger conservation. There are two recurring patterns in these discussions: i) proponents of the exclusionary approach cite a lack of empirical evidence demonstrating cases where local practices have conserved tigers, in order to bolster the case for state ownership of forests; ii) voices of local people, whose culture, identity and livelihood are impacted by conservation policies, are frequently absent. This panel is an attempt to course-correct these patterns by: i) highlighting the case of the Idu Mishmi community of Dibang Valley (Arunachal Pradesh, India) whose cultural practices, combined with secure land rights and legal restrictions on outsider entry, have conserved a previously unregistered population of tigers without any state-sponsored protection mechanisms; ii) bringing together scientists and members of the Idu community, to foster an open and inclusive discussion on indigenous rights, relationship with nature, conservation and development. The speakers include Sahil Nijhawan, who sets the context by presenting his interdisciplinary research explored ecological, cultural and political reasons for the continued persistence of tigers in Dibang Valley. Iho Mitapo, an Idu Mishmi community organiser and eco-tourism entrepreneur who was a part of Dr Nijhawan's multi-year research, will discuss the opportunities and challenges of building sustainable eco-tourism in a remote area that protects the environment and generates local employment. Achili Mihi (Idu Mshmi) will talk about ongoing research to understand the ecological, social and economic impacts and drivers of large-scale extraction of a rhizome, Paris polyphylla, from Dibang Valley heavily priced in Traditional Chinese Medicine. Aito Miwu (Idu Mishmi) will share lived experiences and local narratives around rapid changes to a culture, that has so far had a conservation impact, driven by majoritarian influences, policy change and large-scale development.

Guardians of Jaguars and Snow Leopards

Names and affiliations: Esteban Payan (Panthera Colombia), Valeria Boron (Panthera Colombia), Howard Quigley (Panthera)

Title of presentation/panel/round table discussion: Jaguars depend on well conserved ecosystems as a landscape species

Format: Oral presentation

ABSTRACT: Jaguars (*Panthera onca*) are the most sensitive wildcats to human disturbance in the western hemisphere. Thus, understanding their habitat needs will define ultimate conservation objectives and actions. Here we present data from two studies of jaguars in different human-dominated landscapes that feed basic ecology and biology to inform adequate conservation actions to ensure their permanence in the future. The Jaguar Corridor Demographics project produced the first demographic and reproductive wild jaguar data for Colombia. Here, we GPS-collared two jaguars in the llanos of Colombia, including one of the first pregnant females ever collared and the earliest record of first breeding age at 20 months. Remote tracking of these cats, coupled with camera trapping, showed differential habitat use by sexes, with heavy dependence from the female on riparian forest for refuge, protection of den sites and cubs, and launching the first post-partum hunts. These results show the importance of well conserved riparian forest for jaguar reproduction among human dominated cattle landscapes. The second study was realized in an oil palm landscape in the Magdalena Medio in Colombia. It shows only marginal use of the oil palm by jaguars, but resident jaguars and reproduction in the adjacent patches of remaining dry tropical forest and wetlands. We show how jaguars will only survive and remain in oil palm areas within a matrix mosaic of well conserved ecosystems, low impact harvest and best oil palm farming practices. The two examples suggest that jaguars can coexist with agriculture but only if natural ecosystems remain in the landscape. These data are part of the requirements fulfilling conservation and life history knowledge gaps identified in the Jaguar 2030 Roadmap, a UN led initiative to secure jaguar conservation in their range by 2030.

Names and affiliations: Angel Daen Morales Garcia (Biofutura A.C.), Jonatan Job Morales Garcia (Biofutura A.C.)

Title of presentation/panel/round table discussion: CULTURAL HERITAGE, BIODIVERSITY AND BIOETHICAL; THE CASE OF MEXICAN JAGUAR

Format: Oral presentation

ABSTRACT: This work addresses the importance of the jaguar (*Panthera onca*) in the Mexican sociocultural and bioethical context, especially from the intrinsic relationship that has been consolidated since pre-Hispanic times of this species with indigenous peoples and communities that incorporated this animal into its cultural practices, generating a human-jaguar relationship that is part of the collective memory and cultural rights. Through a legal-social study it is concluded that social and environmental conditions have reduced the symbolic, material and ecological space of this species, affecting cultural rights directly. It is necessary to carry out actions for its conservation from a holistic biocultural approach, establish mechanisms to safeguard the cultural practices related to this species that are compatible with its conservation and adhere to the legal framework, implement strategies to consider the cultural practices associated with this feline as Intangible cultural heritage and formalized by a decree that the jaguar is a national symbol for the conservation of biodiversity in Mexico and Mesoamerica.

Names and affiliations: Jonatan Job Morales Garcia (BioFutura AC, México), Angel Daen Morales Garcia (BioFutura AC, México)

Title of presentation/panel/round table discussion: Jaguar biological corridors and protected areas in America: the response to extinction

Format: Oral presentation

ABSTRACT: The jaguar is the most important animal in all its distribution in Americas. However the jaguar is one of the most endangered animals because the anthropic actions like hunting and habitat loss will finish the jaguars, culture and nature. Natural habitat conversions caused by human activities have caused the loss and fragmentation of jaguar populations in America. Conservation planning for the jaguar at a large scale involves the protection of their core habitat patches to ensure long term conservation of populations and the protection or adequate management of biological factors.

But knowledge is not enough; over time different research groups have worked to learn about biological and ecological aspects of the jaguar; however, we do not know the origin of the loss of this key species in the ecosystems. The global efforts to conserve this cat and other species are not enough. In this paper we present a biological study from the social base to know the jaguar human conflict in order to change the imminent extinction of this species in its continental distribution.

Finally, we identified critical areas to maintain the connectivity between the jaguar habitat patches and consequently maintain the viability of the species. This analysis should be used as an integral planning instrument by decision makers to ensure conservation and change the view of wildlife as a thing, and start to understand the life from other views.

Names and affiliations: LIU Mingyu (Peking University)

Title of presentation/panel/round table discussion: A new threat to snow leopards?

Format: Oral presentation

ABSTRACT: Around 2012, due to the rise then collapse of the Tibetan mastiff market, many dog breeders around Sanjiangyuan Nature Reserve abandoned their mastiffs. Since mastiffs have a range of biological traits and broad morphological adaptability, they occur at densities higher than any other similar sized native carnivores. In recent years, local people have observed incidents of mastiffs in packs attacking snow leopards and other wildlife. As a result, free-ranging mastiffs, acting as an invasive species, may become a novel threat to biodiversity conservation for local highland ecosystems. Our recent research revealed the free-ranging Tibetan mastiffs have high birth rates and density, large home range, combined large body size and group hunting behavior, suggests potential pressure on biodiversity conservation. High dietary overlaps between mastiffs and other carnivores (snow leopards/wolves/red foxes) shows high similarities in dietary structure. Spatiotemporal avoidance from those native carnivores suggests mastiffs may be in a dominant position in the interference and exploitative competition. This research seeks to understand the scale and extent of the impacts from free-ranging Tibetan mastiffs on local ecosystems. Based on our research and interview results, management methods such as adoption and sterilization are tested in 2 sites to control the mastiff population. We can contribute valuable knowledge on a key threat to local carnivores and develop locally relevant solutions that is scientifically based, locally accepted and participatory. As a consequence, we hope to see a better future for the long-term biodiversity conservation of the Sanjiangyuan Region.

Knowledge and Tools for Big Cat Protection

Names and affiliations: Swapnil Kumbhojkar (Jhalana Wildlife Research Foundation, Jaipur), Prof. Reuven Yosef (Ben Gurion University of Negev-Eilat Campus, Israel)

Title of presentation/panel/round table discussion: Leopard (*Panthera pardus fusca*) territorial demarcation in Jhalana Forest Reserve: a camera capture-recapture model

Format: Oral presentation

ABSTRACT: The suitability of capture-recapture models was explored for identifying territories and studying spatial distribution of leopards in the Jhalana Forest Reserve, Jaipur. Camera traps were deployed in the tourist zone, fringe area of Bhomiyaji and Galta range between November 2017 and July 2019 (N = 1984 trap-nights). No clear territorial exclusivity was observed for the males. However, for four females (Flora, LK female, Mrs. Khan, Tim Tim) we observed each in an area of approx. 46 km². Each of the females successfully raised cubs during the study period. Three of them had two successive litters during the two years. Flora was observed to dominate the core tourist zone, LK in the Bhomiyaji area to the Northeast, and Tim-Tim occupied a belt between the two territories. Mrs. Khan established a territory in the mines area to the Southwest. We have observed a change in the territorial boundaries of Flora (towards the tourist route 3 in the south east) in 2019. We assume that one of the reasons are the frequent confrontations with other sympatric carnivores, especially Striped Hyena (*Hyaena hyaena*). Interestingly, Flora was observed to share her territory with her daughter from 2016 - Jalebi, and is now an adult female. We conclude that the capture-recapture models using camera trap data, coupled with photographic evidence and physical observations, is an effective technique to map the territories of leopards and to document inter- and intra-specific behaviours.

Names and affiliations: Shweta Roy Choudhury (Design Accord, Delhi), Swastika Deb (Deakin University, Australia), Senjuti Ghosh (Skets Studio, Delhi)

Title of presentation/panel/round table discussion: The Roaring Cats of India - An analysis of the impact of modern civilization and the subsequent management opportunities

Format: Oral presentation

ABSTRACT: The wild Indian forests are the home to five distinct "Roaring Cats" (genus Panthera) species, namely Asian lion, Royal Bengal tiger, Indian leopard, Snow leopard, and Clouded leopard. When it comes to animal conservation, their depleting figures in India are at the core of the minds of people. The scale of human population growth is radically inversely proportional to the numerical growth of large cats. This increasing demand for human space has caused enormous habitat degradation for large cats – one of the most admired and recognized animals, at the top of the food chain. Even today, wildlife is still the primary source of revenue for many in India's tropical forests, and this has eventually led to what we call "Empty Forest Syndrome," which has a direct impact on the well-being of large Indian cats. Along with the above, severe big cats poaching coupled with inadequate efforts by the public to maintain their species has also resulted in a dramatic contraction of their age spectrum.

The paper thus focuses on first understanding the present situation of large roaring cats across India and then evaluating the growing conflict between human and big cats in both ecological and socio-cultural contexts. Variables such as spatial and temporal research allocation, techniques used to study conflict, intervention assessment, and management suggestions are essential to examine. The ultimate aim at the end is to conserve the Panthera species and to attain an environment where humans and big cat species can coexist.

Names and affiliations: Julian Matthews (Founder and Chairman of TOFTigers)

Title of presentation/panel/round table discussion: From Extinction to Attraction - Tigernomics and its role in the battle to turnaround tiger conservation

Format: Oral presentation

ABSTRACT: As Indira Gandhi, the late Prime Minister of India said “Unless we are in a position to provide for those that live in and around our forests we cannot prevent them from poaching or despoiling our vegetation.” Too often the pressure to preserve wildlands and wildlife is lost in the priority for people to simply survive.

Creating conservation-based livelihoods and sustainable enterprises, through nature based activities, that do not place a burden – and ideally add conservation based value – to wildlife and wilderness preservation, can and is already providing alternative livelihoods to that of extraction and exploitation of these same resources for many rural communities bordering parks. It is what I have called 'Tigernomics'.

Already many tiger reserves and sanctuaries in India and Nepal are supporting tens of thousands of new livelihoods, both directly and indirectly through nature-based services, and today these protected areas have the biggest visitor footfall and harbour the highest densities of tigers. This economy has also been changing local behaviour and attitudes towards the protection of wildlife and wilderness areas across South Asia.

Much more needs to be done, and with better mutually beneficial partnerships and smarter long term planning to get the most out of these new rural economies, we can multiply its value considerably going forward, given the potential for this sector, which is still in its infancy in South Asia.

Names and affiliations: LIU Yanlin (China Felid Conservation Association), HUANG Kerry (China Felid Conservation Association), SONG Dazhao (China Felid Conservation Association)

Title of presentation/panel/round table discussion: Wilderness and Leopards in Populated Eastern China: Plan and Practice of A Rewilding Movement along the Taihang Mountains

Format: Oral presentation

ABSTRACT: Leopards in China have suffered dramatic population decline and range contraction in the past 50 years. Established in 2011, China Felid Conservation Alliance (CFCA) has been involved in leopard surveys at Taihang Mountains in northern China. Since 1700, the forest cover along the mountains had dropped under 5% by 1950s. After over a half-century's reforestation, the forest cover has increased over 20%, but biodiversity restoration remains problematic. The mountains provide vital habitats for North Chinese Leopards, the unique leopard sub-species in China, but habitat fragmentation and prey depletion are threatening long-term survival of these big cats. In 2015, we launched Leopard Conservation Project in central Taihang Mountains. The project is in a forest of 500sq.km in Heshun County, Shanxi Province, which harbors a leopard population over 10 resident adult individuals. Camera traps have been maintained to monitor the leopards' reproduction and dispersal, and compensation scheme and community outreaches implemented to mitigate human-leopard conflicts. We initiated educational campaigns both online and offline to involve larger audiences for leopard conservation, which successfully turn the species into a flagship national wide. Our efforts have secured the local leopard population effectively, which may act as source population for future recovery. In 2017, we initiated "Bring Leopards Home" project, which aims to recover leopard populations along the northern Taihang Mountains through natural dispersal, and eventually establish leopard population in Beijing, where the first specimen was collected in 1860s, and last recorded around 2000. In the past two years, we have organized surveys to evaluate the habitats, preys and human disturbances along the northern Taihang Mountains, laying foundations for future recovery planning.

Living with Big Cats: Lessons Learned

Names and affiliations: Suyash Keshari

Title of presentation/panel/round table discussion: The Importance of Flagship Species

Format: Oral presentation

ABSTRACT: Due to their charismatic appeal, flagship species such as lions, tigers, elephants, rhino, polar bear etc. have become an ambassador for their habitat - the forests, grasslands, mangroves, mountains, tundra and every single species that live in it. There are countless tales, legends and films about these charismatic animals. So it is very easy to deliver a strong conservation message with a post about an animal that is admired by people all across the world.

A large majority of people happen to connect more with an animal such as the tiger than, say a frog or a honeybee. Yet these two species are extremely important to the ecosystem, perhaps more than the tiger itself. In an ideal world, every being would be considered equally charismatic, by every single person. But we do not live in that world, at least not yet.

My presentation will show that a large majority of people do connect with the tiger. We can use that to save the frog and the honeybee, too. Flagship species such as the tiger are able to raise a lot of awareness/funds for conservation purposes and also affect political changes across the world, which frogs and bees are unfortunately not. Yet they share the same habitat so by saving one you are also conserving the other. This also begs the question of: what about the wild places which do not have any "flagship species." Here I will argue that we need to find ways to change peoples' opinions through creative storytelling techniques along with community involvement to realize the long term importance of these animals.

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Names and affiliations: Subhayu Mishra, Monalisa Bhujabal, BJ-Bhubaneswar (Wild Orissa)

Title of presentation/panel/round table discussion: SUNABEDA KHARIAR- A CASE OF MISSED OPPORTUNITY?

Format: Oral presentation

ABSTRACT: In association with the WWF India (Tiger Conservation Program) in 1999, intensive surveys were conducted in Sunabeda Wildlife Sanctuary and forests to the south of it by 'Wild Orissa' and findings were extremely encouraging. Wild Buffalo herds were still migrating from the neighbouring Chattisgarh to the high plateaus and returning. Tiger presence was very good, though no presence of the Barasingha. The excellent forests beyond the Indra river, forming the southern boundary of the Sunabeda Wildlife Sanctuary, held a lot of promise for having an area in excess of 600 sq kms being possible to be set-aside free from humans. The presence of Chuktia Bhunjia and Paharia tribe and their age-old dependence on these forests were considered. The National Symposium for Conservation of Wild Tigers in Odisha in 2003 provided the much needed push, as very strong recommendation emerged for Sunabeda-Khariar. During 2004, a proposal was finally made by the state government for a tiger reserve extending over 956.17 km² in Nawapara district. After a much protracted campaign, 2008 saw the National Tiger Conservation Authority giving "in-principle" approval to four new reserves. Sadly it has been 11 years, and Sunabeda is yet to be notified though the others though Shahyadri and Pilibhit have since been already notified. Unfortunately since 2009 left wing extremism afflicted these forests, aided by incursions of elements from neighbouring states, and the consequent positioning of para military forces. The issue of providing an adequate 'shock absorber' for a future Sunabeda-Khariar Tiger Reserve was taken up by 'Wild Orissa' during 2016, while considering an eco-sensitive zone for the Sunabeda Wildlife Sanctuary. Finally an eco-sensitive zone of 928.94 sq kms, factoring a proposed future boundary for the Sunabeda-Khariar Tiger Reserve, was notified during 2019.

Names and affiliations: Nikit Surve (Wildlife Conservation Society, India)

Title of presentation/panel/round table discussion: Learning the "Art of living with leopards"

Format: Oral presentation

ABSTRACT: India is unique in the way wildlife and people share spaces. Although scientists are only at the brink of understanding how this phenomena of shared spaces exists, where large carnivores share space with a high density of humans, there is no doubt that India has many lessons the rest of the world can learn from in terms of wildlife conservation. Sanjay Gandhi National Park (SGNP) in Mumbai is one amongst the few protected areas across the globe that has a high density of leopards present among a high density of humans. Commonly, the leopards seen in the city are termed "straying", indicating how people still view the animal as something that stays inside the Protected Area (PA) without acknowledging that it does not understand where the human boundaries are drawn. This traditional belief gave rise to a management intervention where leopards were translocated because of fear. Research shows that translocation gives rise to the number of attacks on humans by leopards. During the years between 2000 and 2002 Mumbai along the periphery of SGNP recorded attacks on people which went up to 28 on average per year. But a mass awareness drive based on research findings helped people understand the do's and don'ts when dealing with leopards. Currently our research findings show that leopards are present at high density in the human dominated landscape of SGNP which has a peripheral density of 20,000 people/sq. km. In this research presentation I wish to discuss how leopards are feeding on both wild as well as domestic prey in the SGNP landscape, how due to mass awareness and media sensitisation trapping of leopards has been reduced thereby reducing conflict and how leopards are revered as deities termed as 'Waghoba' by the local Warli tribals.

Names and affiliations: Amit Verma (Uttarakhand Forest Department), Neha Verma (Uttarakhand Forest Department)

Title of presentation/panel/round table discussion: Does it pay to be a PA? Evaluating biodiversity conservation outcomes of creation of Nandhaur Wildlife Sanctuary, Uttarakhand, India

Format: Oral presentation

ABSTRACT: India has a long history of using the Protected Areas System as a tool for wildlife conservation. The highly successful tiger conservation program hosts 70% of the world's population of tigers. Alternatively, a section of conservationists believes that protectionist approaches to wildlife conservation has failed to protect wildlife and its habitats and among alternatives Community-Based Wildlife Management approaches have gained acceptance among them. Intent of creation of PAs invoke strong and opposing sentiments among wildlife conservationists, social activists, politicians and the local population. This dichotomy can be resolved by objective evaluation of the outcomes and impacts of creation of a PA. In this context, this study evaluates the creation of Nandhaur Wildlife Sanctuary (NWLS) on wildlife conservation, ecosystem service enhancement, social inclusion, economic growth and sustainable development. It is a part of extended Corbett Landscape and has been recognized as an important tiger habitat block (THB-III). Prior to its declaration as a PA, the population of tigers was estimated to be 8 while it has increased to be above 30 in 2019, a dramatic 4-fold increase in a span of 6 years, which definitely signals towards a positive impact of declaration of this area as a PA. In this study, we look at conservation outcomes and reasons behind it like increased focus on conservation, participatory programs for community development, change in management strategies by the forest department and increase in support by external agencies.

Roundtable: In Search of Sustainable Alternatives to Trophy Hunting for Protected Areas: Big Cats and Hunters

Names and affiliations: Colin Bell and Ian Michler (South Africa)

Title of presentation/panel/round table discussion: In Search of Sustainable Alternatives to Trophy Hunting for Protected Areas

Format: Round table discussion proposal (two proposals combined)

ABSTRACT: This presentation will consider and promote some of the sustainable alternatives that should replace trophy hunting as a land-use option in national and regional protected areas across Africa. It also serves as a global call to every stakeholder in the wider conservation community to take up the challenge of seeking better ways of caring for our wildlife.

The role of trophy hunting in Africa has increasingly become one of the principle conservation debates, and rightly so. Often heated and mostly polarizing, the topic will take on even greater urgency as a number of the continent's most iconic species, many of them sought after by the hunters for their impressive body parts, slide towards extinction. Given the urgent need to protect the continent's gene pool, we believe that trophy hunting carries too many negative impacts and is not an effective way to manage habitats and biodiversity in protected areas. As Dan Ashe, the ex-Director of the US Fish & Wildlife Service has said, "The argument that we need to hunt endangered animals to conserve them, is old and tired."

While the activity has served certain interests well, there are more appropriate and sustainable ways to deliver on wider conservation promises and socio-economic challenges. In much the same way alternative energy sources such as wind and solar are replacing fossil fuels, our community needs to put heads together to consider, plan and formulate new models to replace anachronistic and unsustainable ones such as trophy hunting.

Names and affiliations: Vladimir Bocharnikov (Wildlife Ecology and Conservation Laboratory of the Pacific Institute of Geography, Far Eastern Branch of the Russian Academy of Sciences),

Title of presentation/panel/round table discussion: Big cats and hunters: the pros and cons of nature conservation

Format: Round table discussion proposal (two proposals combined)

ABSTRACT: The confrontation between hunters and "green" activists in the matter of nature conservation is a well-known problem. There is convincing evidence that the shooting of rare animals causes great damage to their conservation. Nevertheless, there is a big difference and one should pay attention to the big difference that exists between officially authorized, often trophy hunting, and illegal shooting, such as conducted by poachers. It can be noted that both in the case of organizing and conducting legal hunting, and in poaching shootings, there is commercial interest. Wealthy hunters from developed countries come to Africa to get an interesting trophy. Such hunting is quite expensive, and in some cases, funds from organizing and conducting trophy hunts are available for environmental protection in areas where threatened species of large cats live. In most cases, poaching of large cats is

also carried out to obtain a trophy - a beautiful animal skin, but perhaps an even more significant incentive for such crimes is the sale of animal derivatives for medical purposes to the countries of Southeast Asia. It is necessary to discuss the causes and conditions that allow poaching to exist all over the world; ways to reduce the damage to wildlife from illegal activities should be found. Reasonable solutions are needed in solving regional problems of conservation of large cats, and in this regard, new means can be found to achieve a compromise between hunters who are capable of real actions in preserving wildlife and large world conservation organizations involved in the conservation of wilderness.

Avian ecology and threats to bird communities: Intelligent Tinkering Involves Saving All The Pieces

Names and affiliations: Professor Reuven Yosef (Ben Gurion University of the Negev Savitribai, Phule Pune University, Israel)

Title of presentation/panel/round table discussion: Avian Migrations and Connectivity

Format: Oral presentation

ABSTRACT: Since the industrial revolution, humans have adapted to an ever-increasing standard of living. The race to benefit humanity has for the past 250 years resulted in greatly polluted and denuded resources of the sea, land and air. We considered natural resources and ecosystem services to be infinite but in the past century have discovered otherwise. Anthropogenic activities have resulted in the Earth's climate discontinuing the cycle of 100,000s of years resulting in "climate change" and "global warming." This requires the flora and fauna to synchronise their life cycles between the different components of the food web. One such group is the avian migrants. Not only must they adapt to the changing resources on the breeding grounds but also enroute on migration and at the wintering grounds. This leads to a conservation challenge which can encompass whole continents, especially for cross-equatorial migrations. They require habitat connectivity in order to refuel, recuperate from the rigors of crossing inhospitable habitats, and to reach their breeding grounds in time to fledge their young such that they in their turn are ready for the rigors of the migration south. Only if the life cycle is completed, and fitness compensates mortality, will a species sustain itself in the present fast-changing environment. For the conservation of migratory species, which make up a considerable proportion of the avian community as we go north towards the arctic, humans have to take into consideration habitat use and preservation at scales previously ignored. Humans have to accommodate the requirements of migratory species, which give us innumerable ecosystem services worth billions of dollars, in order to attain a win-win situation wherein humans can subsist and allow the avian migrations to continue.

Names and affiliations: Prof. Reuven Yosef (Ben Gurion University of the Negev Savitribai, Phule Pune University)

Title of presentation/panel/round table discussion: Migratory connectivity and stop-over sites: a case study from Eilat, Israel

Format: Oral presentation

ABSTRACT: Annual migration is a natural phenomenon that many species have to undertake. A large proportion of the populations (ca. 40-60%) have to pay with their lives to accomplish the rigors of this annual rite. The challenges that each individual faces are many and greatly varied. In addition to the natural challenges, in the past century human “development” has added to the challenges that they have to overcome. Anthropological changes can be instantaneous and encompass whole habitats/regions. These changes usually are not advantageous to the wild and the populations pay further losses while trying to find alternatives in what is usually an intrinsic characteristic.

An example of one such change is the dry salt marshes of the southern marshes of the Arava (Rift) Valley region of Israel. The region is an alluvial fan of the rivers that flow down from the Israeli and Jordanian side of the borders and for millennia the flood waters reached this region prior to reaching the eastern arm of the Red Sea (aka Gulf of Eilat/Aqaba). A plant community that developed in this xeric region was dominated by the bush *Suaeda monoica*. In order to avoid the extremes of the desert summer and winter, most of the plants in the habitat fruit and flower during spring and autumn. This coincides with the migration seasons of the avian breeding populations of EurAsia and that migrate in the autumn to sub-equatorial Africa and return north in the spring. The location of the Eilat salt marsh is such that it is located just at the northern boundary of the combined deserts known as the Sinai-Sahara-Sahel desert belt. The site allowed many a species to refuel prior to the crossing of this challenging ca. 3000 km, but even more so in the spring when they had accomplished the crossing and required a habitat to replenish their fat and muscle reserves prior to accomplishing the migration to their breeding grounds across Europe and Asia.

The Eilat region was captured by the newly founded State of Israel in 1948. Since then the flat area of the salt marsh was developed for human purposes – airfield, agricultural area, hotels on the beach, etc. However, in order to help the migratory bird populations a concerted effort was made since 1993 by the International Birding and Research Centre to establish a Bird Sanctuary on what had become the local garbage dump at the northern end of the marsh. The area was landscaped anew and indigenous plant species planted with the idea of trying to give the birds a concentrated source of food in an area that was ca. 9% of the original habitat.

The ringing data proves that many of the more than 30 species that migrate through this point take advantage of the habitat and stop-over for 2-3 weeks in order to “refuel” before continuing northwards. Birds ringed at the site have been recovered from Wales in the west to central Russia in the east. Studies on migratory strategies of Passerines, near-passerines, raptors and waders have given us an insight into their migration ecology and habitat requirements. It is imperative that the lessons learned from this site be implemented in order to establish other critical migratory stop-over sites and to ensure that humans do not contribute to the hardships of the annual migrations of the breeding birds of EurAsia.

Names and affiliations: ZHANG Mengyuan (Beijing Forestry University), FAN Shuxin (Beijing Forestry University), HAO Peiyao (Beijing Forestry University), DONG Li (Beijing Forestry University)

Title of presentation/panel/round table discussion: Study on Scenic River Plant Landscape Based on Bird Habitat Conservation - A Case Study of Wenyu River - North Canal in Beijing

Format: Oral presentation

ABSTRACT: In recent years, rapid urbanization is leading to a sharp decrease of bird diversity in cities. The plant landscape in the river basin plays an important role in habitat conservation. This paper aims to explore the effects of plant landscape planning for bird habitat conservation in a scenic river, and to study the design methods of plant landscapes based on bird habitats conservation. Wenyu River - North Canal, a river located in the east of Beijing with uninterrupted green spaces along the banks, has the potential to become the migration channel for migratory birds. The program investigated the vegetation pattern of Wenyu River-North Canal by using GIS technology and analyzed the distribution and ecological connectivity of different bird habitat types in the river basin. Based on fieldwork, we analyzed the species composition of birds in different habitats. The results showed that the distribution of different habitats was uneven. The thick forest and grassland habitats were poorly connected. We also explored the correlation between habitat connectivity and bird diversity. The results showed that the diversity of birds in water body habitats was higher, while that in grassland habitats was lower. The diversity of birds was correlated with habitat connectivity. According to the analysis results, aiming at bird habitat conservation, a vegetation landscape optimization plan of Wenyu River-North Canal basin was proposed, including protecting important habitat patches, optimizing plant community structure and selecting plant species.

Name and, affiliations: Daniel S. Cooper (University of California, Los Angeles, US), Courtney McCammon (Culver City, California)

Title of presentation/panel/round table discussion: A community-science program comes to Hollywood: Nesting Raptors in Griffith Park

Format: Oral presentation

ABSTRACT: Griffith Park is one of the world's largest municipal parks (1,700 ha), and is home to both the world-famous "Hollywood Sign", as well as a mountain lion dubbed P-22. In 2017, Friends of Griffith Park funded our pilot study to engage local residents to search for and monitor nesting raptors in and around the park. In three years, this effort has expanded out from the Hollywood area to cover a large portion of the city of Los Angeles, taking in the area around Dodger Stadium, Beverly Hills, and other landmarks. We have documented phenology and nesting success of roughly 60 active nests per year of 4 locally-nesting raptor species (*Buteo jamaicensis*, *Buteo lineatus*, *Accipiter cooperii*, and *Bubo virginianus*), which has improved our understanding of how these species utilize both natural and highly-urbanized habitats. In addition, we engage dozens of volunteers from the area as they visit these nests, take field notes, and learn about raptor biology. Most recently, we have shared our nesting sites and data with park officials who can better manage local usage in and around the park, which include everything from international tourists, to jog-a-thons, to multi-day film shoots. Our project may serve as a model for engaging local communities in participating in "real science" while also appreciating the wild creatures they share space with throughout the year.

Avian ecology and threats to bird communities: Recovering Species

Names and affiliations: S. CHANDRASEKARAN

Title of presentation/panel/round table discussion: Landscape level conservation of Moyar Valley--the last refuge beyond Vindhya

Format: Oral presentation

ABSTRACT: Moyar valley is the last vestige with viable breeding population of Gyps vultures classified as Critically Endangered, south of Vindhya or Deccan plateau--All the other Southern States, viz. Andhra, Karnataka, Kerala and Telanga have very minimal or negligible breeding birds-- Gyps vultures are facing extinction from various factors, including habitat loss, harmful effects of Diclofenac (NSAID drug), changing food chain, etc.-- No reliable study on wild population of Gyps vultures--all the crash and disappearance relates to populations thriving around habitation, e.g. Delhi--here in Moyar valley from time immemorial, they are part of this landscape--Moyar valley consists of Segur plateau and riparian jungle on the banks of river Moyar and dry thorn forests of tropical India--ideal habitat for elephant, tiger, leopard, hyena, dhole, antelopes providing ideal prey base to vultures due to natural kills and death--very little studies due to Bandit Veerappan ruling these places till 1990s--local tribes talk of thousands of vultures till 1990s--influences of past practices may be a factor for this relict population restricted to this belt Customs and practices of tribes in this area a major factor for surviving population of Gyps vultures--studies into ethnic way of living reveals the drastic change in habitat pattern--alterations in the name of management of PAs--traditional wisdom not an integral part of management plan or committee--erosion in the traditional lifestyle of tribes due to civilisation and consumerism hitherto unknown to them--non-recognition of traditional skills like tracking, ease of negotiation of wild animals, judicious use of natural resources, etc.

Names and affiliations: Alan Monroy-Ojeda, Javier de la Maza, Santiago Gibert (Natura y Ecosistemas Mexicanos, Ciudad de México; Dimensión Natural S.C., Veracruz)

Title of presentation/panel/round table discussion: Harpy Eagles (*Harpia harpyja*) in Mexico. The quest to find and conserve the last eagles of tropical Mexico.

Format: Oral presentation

ABSTRACT: The Lacandon Rainforest in southeastern Mexico is one of the most extensive wilderness rainforest massifs in the country and maintains some of the last populations of large neotropical raptors in the country, including the Harpy Eagle (*H. harpyja*), three Neotropical eagles of the *Spizaetus* genus (*S. tyrannus*, *S. ornatus*, *S. melanoleucus*), and the King Vulture (*Sarcoramphus papa*). The gradual reduction of their habitat, poaching and substantial reduction of their prey throughout the Mexican territory have caused a drastic decrease in Neotropical raptor populations to the point that their current distribution is practically restricted to existing natural protected areas and the few areas with extensive remnants of well-preserved rainforests and tropical forests. Until recently, it was thought that Harpy Eagles were already extirpated from the country. However, in 2011 a photographic record gave hopes to the Mexican Conservationist Community about the specie's presence. Given the importance and deep ignorance of these species in Mexico, we started a "Neotropical Raptor Conservation Monitoring Program" in coordination with local community monitoring groups. Since 2016 systematic monitoring has been carried out in several protected areas. Records of highly threatened species such as the Harpy Eagle (*Harpia harpyja*), the Ornate Hawk-Eagle (*Spizaetus ornatus*), Black Hawk-Eagle (*Spizaetus tyrannus*), Black-and-White Hawk-Eagle (*Spizaetus melanoleucus*) and the King Vulture (*Sarcoramphus papa*) were recorded. Abundance estimates reveal that eagles have become scarcer, while other species remain locally common.

Names and affiliations: Charu Bhanot (TERI School of Advanced Studies, Delhi), Sudipta Chatterjee (TERI School of Advanced Studies, Delhi)

Title of presentation/panel/round table discussion: Assessment of Avifaunal Diversity of Najafgarh Jheel wetland in Delhi: A habitat for resident and migratory birds

Format: Oral presentation

ABSTRACT: Rapid urbanization has rendered natural wetlands to be a part of urban ecosystems. These are sensitive ecosystems and any prolonged changes arising in the wetland or its surrounding catchment area bring deviations in their ecological character and functions. Avifauna is one of the foremost observable elements in the wetlands. Birds have higher dispersal rates as compared to other wetland species and are sensitive to habitat change. The birds are ideal indicators of wetland ecosystems, hence, assessment of their presence, richness and abundance are inimical to monitoring of the health of any wetland ecosystem. A literature review for India emphasizes the need for conservation of urban wetlands. The present study highlights some major conservation issues of an urban wetland situated in Najafgarh drain, in the cosmopolitan city of Delhi and its conservational aspects. The National Wetland Atlas, 2011, has no mention of Najafgarh Jheel as an important wetland. The primary data collection on a monthly basis spread over a year observed 93 species along a stretch of 18 km having highest bird diversity and abundance in the lake environment using Distance in R. A spatio-temporal study was undertaken for the past 30 years to quantify the change in extent of wetland delineation using satellite imagery and ARC GIS to understand the urban threats and anthropogenic activities leading to biodiversity loss.

Avian ecology and threats to bird communities: A vanishing species

Names and affiliations: Jatin Mathur, Dr. Janmejy Sethy (Amity University), Mr. Kedar Gore (The Corbett Foundation)

Title of presentation/panel/round table discussion: The making of a vanishing non-charismatic species: How the conservation discourse in 20th century has framed Great Indian Bustard in Indian Media.

Format: Oral presentation

ABSTRACT: Conservation has been dominated by various frames influenced by various socio-political and economic factors. This research tries to explore an historical question about a species which has very little relevance for inclusion in the modern-day conservation political framework of India as evident by the history of 50 years. The findings show that changes in the temporal priority has been gradual after 1950's but the narratives were found to be more punctuated reflecting abrupt socio-politically influenced events affecting more greatly the public sphere. The early 50's and 60's were crucial years in getting the wildlife conservation and Great Indian Bustard crises in the mainstream public discourse as well as initiate relevant political and policy-based discussions. Three events primarily have been identified and developed into distinct case studies empirically from the data set and earlier literature. There are 'blind' notions of experts around 1980's where the idea of 'virtual populations' has formed, resulting in false impression of increased population, opposite of reality. The metaphor of 'Non-charismatic species' has been used to communicate the failure of various stakeholders to get the necessary attention and effort, assuming that charisma reflects conservation. This study reflects media as an effective tool for generating historical data for species conservation along with understanding evolving public discourse in society.

Names and affiliations: Mr. Varun Kher (Wildlife Institute of India), Dr. Sutirtha Dutta (Wildlife Institute of India)

Title of presentation/panel/round table discussion: Response of bird communities to land-use driven habitat change in the arid grasslands of Thar desert.

Format: Oral presentation

ABSTRACT: The Indian Thar desert has seen massive loss of grassland habitat in the last few decades, largely due to change in land-use patterns. This study looked at the impacts of land-use change on native fauna with bird communities as the model taxon. Birds were surveyed on sixty-eight transects that were placed in a ~2000 sq.km area in Jaisalmer district of Rajasthan. These transects were laid proportionally over four strata which represented a particular land-use regime – Protected grasslands (Regulated Grazing), rangelands (Intensive grazing), non-irrigated croplands (low-intensity agriculture) & irrigated croplands (high-intensity agriculture). At the local scale, rangelands and non-irrigated croplands had bird communities that were similar to protected grasslands in terms of species richness, abundance and community composition. At the landscape scale, rangelands and non-irrigated croplands were together able to sustain all the species found in protected grasslands. On the contrary, local bird communities of irrigated croplands were significantly different from the communities of the other three land-use types. The species richness and overall abundance of these communities in irrigated croplands was significantly higher while the community composition was drastically different from all other land-use types. This change in community structure was primarily driven by presence of originally non-native species that have colonised irrigated croplands, especially along the Indira Gandhi Canal. Results suggest that irrigation driven intensification of agriculture is the primary habitat threat to bird communities of the Indian Thar desert. My findings corroborate many species-specific studies that have reported low-intensity croplands and rangelands to be potential secondary habitats for grassland fauna. Results from this study further support the philosophy of strategically managing human-dominated arid/semi-arid areas as low-intensity agro-grassland mosaics to sustainably reconcile biodiversity conservation with human livelihoods.

Names and affiliations: Dr Hemsingh Gehlot (Jai Narain Vyas University, Jodhpur), Tapan Adhikari (Jai Narain Vyas University, Jodhpur), Vipul Kachhwaha (Jai Narain Vyas University, Jodhpur)

Title of presentation/panel/round table discussion: ASSESSMENT OF GREAT INDIAN BUSTARD (*Ardeotis nigriceps*) POPULATION AND THEIR CONSERVATIONAL THREATS IN THE THAR DESERT OF RAJASTHAN

Format: Oral presentation

ABSTRACT: Marusthal, or the Thar Desert Landscape, is a unique arid ecosystem. It is a home of many endangered wild animals and birds like Indian Wolf (*Canis lupus pallipes*), Desert fox (*Vulpes vulpes pusilla*), Indian fox (*Vulpes vulpes bengalensis*) and Golden Jackal (*Canis aureus*) and Great Indian Bustard (*Ardeotis nigriceps*). The Great Indian Bustard (GIB) locally known as Godawan belongs to the family Otididae of order Gruiformes. The International Union for Conservation of Nature (IUCN) declared GIB a 'Critically Endangered' species of the world from its previous category of 'Endangered' during 2011. It was historically well distributed throughout western Rajasthan but there is a fast decline in the population of GIB throughout the country due to destruction of habitat, increased human population and livestock numbers in their habitat. During 2015, the forest department counted only 44 GIB in the desert region. Over the last few decades, many activities such as mining, stone quarrying, growth of industries, and power projects along with the expansion of roads, putting up electric poles, wind turbines and other infrastructures have increased the severity of habitat degradation and disturbances.

Avian ecology and threats to bird communities: vanishing species - recovery for the future

Names and affiliations: Ar. Ami S Mehta

Title of presentation/panel/round table discussion: REWILDING- The Land of Kutch, Gujarat

Format: Oral presentation

ABSTRACT: The Great Indian Bustard (GIB) is a critically endangered bird. When a region is planned, it is only designed from the human-centric perceptions, regardless of any important wildlife behavioral pattern over the surface of the land, resulting in a degradation of the land surface as well as species extinction. In response to the species extinction, various sanctuaries are developed for the protection of these endangered species. However, the nature of these protected areas may not always be confinements limited to a particular area. The sanctuaries are stagnant, they may not allow the movement and flow of the species required for the landscape integrity in a region. GIB struggles for its existence due to the lack of the derivation of a method to bring together its habitat with other actors in the landscape.

The questions driving the study are

1. How can we spatially interconnect wildlife behavior and basic human needs for coexistence and landscape integrity over a region?
2. Can we generate a method to conserve & create a habitat which is not restricted to a confined sanctuary area but can grow over time, regenerate healthy mosaics, reducing the degradation over land and save critically endangered species?

This may be demonstrated as an extension to the existing Bustard sanctuary, in Naliya Grasslands, at Kutch, Gujarat which once flourished with a large number of Bustards. But in recent years, much haphazard development in the region have degraded these grasslands. The present study demonstrates the re-creation of an existing land mosaic such that it creates a niche for the wildlife species which are endangered due to alterations in land use patterns.

Authors and affiliations: Dr. Sumit Dookia (University School of Environment Management, Guru Gobind Singh Indraprastha University, New Delhi), Dr. Mamta Rawat (The ERDS Foundation, New Delhi, Godawan (Community) Conservation Project-Jaisalmer, Rajasthan)

Title: Great Indian Bustard and community ownership development for conservation of critically endangered bird: A challenge of millennium

ABSTRACT: It is a well-established fact now that the global population of Great Indian Bustard (GIB) is very low and has reached a threshold, and it needs immediate scientific intervention for recovery. This was well understood after years of landscape level population survey and scientific interpretation of data, therefore an institutional population recovery project has been initiated. Since this bird which requires a large landscape with mixed land uses and few altogether undisturbed areas for breeding, achieving the result of conservation breeding is a challenge. Authors have worked in the landscape for the last 2 decades and have experimented with many community conservation concepts' The same experience has been used to design an open-concept project for current distribution of GIB in Jaisalmer, Rajasthan. This area is the last breeding population and it needs our utmost care for survival of the remaining birds.

This project has multiple objectives, where the role of local communities (native residents of all caste and creed) of GIB distribution area has been conceptualized and various level of intervention started. One of such intervention was to start a *nature tourism based rural entrepreneurship*, where local youths were selected, sensitized, trained and further nurtured and groomed to take ownership of GIB and correlate their income with its survival. Another was is to build an *anti-poaching network of local communities*. Also, *monitoring of GIB* has been initiated, where its seasonal and yearly movement in vast landscape of Thar Desert is monitored.

Author and affiliation: Avani K. Varma, Former Principal Chief Conservator of Forests and Head of the Forest Force, Karnataka

Title: Conservation and Sustainable use of Grassland and Semi-Arid and Arid eco ecosystems in India- Why is it necessary and needs urgent attention?

Format: Oral presentation

ABSTRACTS: Grasslands along with semi-arid and arid areas of India are unique eco systems. Grass lands in India cover roughly 52,60,000 km², excluding temperate /alpine cover in Himalayas and shola grass land in Western Ghats and most of this is either completely degraded or in various stages of degradation. Protection, development and sustainable use of grasslands are very important for the rural economy and livestock areas as these are primarily used for cattle grazing .They also act as crucial shelter and habitat for a large number of wild fauna some of which are critically endangered. Many natural grasslands (e.g. wet grasslands of terai, shola grasslands of the western Ghats, dry grasslands of Deccan) have been converted to plantations, sometimes even in Protected Areas. Some of the most threatened species of wildlife are found in the grasslands and deserts (e.g. Great Indian Bustard, Lesser Florican, Indian Rhinoceros, Great Indian Wolf, Snow Leopard, Nilgiri Tahr, Wild Buffalo etc.).

India needs to have a concept of scientific pasture management. Efforts in India for pasture development remain confined either to improvement of existing grasslands or introduction of suitable exotics. Unique biological diversity has also not been assessed. Tropical grasslands, which are in the mid successional stage, are largely maintained by annual or biannual burning in most of the protected areas (sanctuaries and national parks), whereas in unprotected areas they are simply left to be managed on their own by livestock grazing and other biotic factors. Unscientific and reckless management have not only made these grasslands and pastures barren and unproductive, but have accelerated the process of desertification inviting ecological disaster.

Grasslands are the 'common' lands of the community which are not managed as an ecosystem in their own right by the Forest Department whose interest lies mainly in trees, not by the Agriculture Department who are interested in agriculture crops, nor the Veterinary Department who are concerned with livestock, but not the grass on which the livestock depends. Keeping in view the vital roles played by grasslands in India's economic as well as ecological security, and the lack of any perceptible action by the concerned departments, there is an urgent need to launch new schemes for biodiversity conservation of its grasslands, and semi-arid and arid zones.

Roundtable Discussion: Life of Weaver Birds, Humans and Palm Trees in Odisha - Interdependence and Mobilization of Conservation Efforts

Names and affiliations: Monalisa Bhujabal (Wild Orissa), Sulava Sethi (Wild Orissa), Suchitra Sahoo (Wild Orissa), Sudhanwa Dash (Wild Orissa), Shibaji Charan Nayak (Wild Orissa)

Title of presentation/panel/round table discussion: Life of weaver birds, humans and palm trees in Odisha - interdependence and mobilization of conservation efforts

Format: Roundtable Discussion

ABSTRACT: In an unprecedented mobilization of human resources for the cause of wildlife conservation in the Indian context, 560 persons participated voluntarily in surveying and counting weaver birds in the Odisha Weaver Bird Count 2019. 'Wild Orissa' who have been conducting Weaver Bird Counts in state of Odisha since 2016 annually, organized this years' count. The count resulted in (1) Baya Weaver Ploceus philippinus- 15,331 (2) Streaked Weaver Ploceus manyar- 3,000 (3) Black-breasted Weaver Ploceus benghalensis- 35. Total weaver birds counted during 2019 in Odisha: 18366 - an all-time record for the state of Odisha and the highest for any state in the country! Volunteers were from septuagenarians to teenagers!! The census showed how damaging Cyclone Fani has been on the breeding habitats of weaver species. Cutting of palm & date palm trees and toddy extraction from date palm trees by people, also, was a reason as to why weavers did not chose many trees for nest building, while urban and semi-urban areas in Odisha, are becoming devoid of weaver birds due to non-availability of proper trees. Planting palm trees was a traditional practice in villages in Odisha, but now discontinued over years due to emphasis on urbanization and development. The important issue of interdependence of life of a weaver bird with that of humans and palm was established.

<https://gcc02.safelinks.protection.outlook.com/?url=www.wildorissa.org&data=02%7C01%7C%7Cf5a9614d85bd49076ab708d7383aa0d5%7Ced5b36e701ee4ebc867ee03cfa0d4697%7C0%7C1%7C637039696764948089&data=V%2BhGC0Y7Kmp0sDNGvABhMaQuOWnevKESgo%2BqTgFihVk%3D&reserved=0>

Rewilding, reintroductions, restoration to protect free-willed ecosystems: rewilding and restoration issues in China

Names and affiliations: CAO Yue (Tsinghua University), HOU Shuyu (Tsinghua University), PENG Qinyi (Tsinghua University), YANG Rui (Tsinghua University), Steve Carver (University of Leeds)

Title of presentation/panel/round table discussion: Dewilding and Rewilding in the Chinese Context

Format: Oral presentation

ABSTRACT: Rewilding is an emerging method of ecological protection and restoration and refers to the increase of wildness in certain landscapes, with particular emphasis on improving ecosystem resilience and maintaining biodiversity. In China, research on rewilding is scarce. This presentation systematically reviews the process of dewilding and rewilding in the Chinese context to fill the relevant knowledge gaps. We first explain the dewilding process in of Chinese history and explore the issues of population growth, landscape change, and species loss during the period of agricultural civilization and industrial civilization. Rewilding is of great significance to China's ecological protection and restoration, due to the following reasons: 1) China has a long history of land development. With continuous expansion of civilization, wilderness and wildlife have been severely damaged. Especially in the process of high-speed urbanization, human activities continue to increase, and infrastructures continue to expand, which have caused a significant decline in wildness in many regions; 2) In terms of opportunities. In recent years, there has been the hollowing out of rural areas and the abandonment of agricultural land in certain areas, the restoration of wild animal populations, and increasing public desire for wild nature, which has brought opportunities for rewilding practice in suitable areas. China still has a large amount of wilderness. At the same time, China has carried out ecological restoration projects such as returning farmland to forests, returning grazing land to grassland, returning farmland to wetlands, re-introduction of species, protection and restoration of large carnivores, connectivity conservation and ecological corridor construction, ecological immigration, near-natural forestry and other engineering projects related to rewilding. However, there has not been systematic and large-scale rewilding projects.

Authors and affiliations: SHEN Qian (Beijing Forestry University), LI Dong (Beijing Forestry University)

Title: Rewilding: Restoration of Free-willed Ecosystems of Mining Wasteland

Presentation format : Oral presentation

ABSTRACT: With depletion of urban resources, projects such as new city construction and real estate development have led to rapid expansion of the city to the surrounding suburbs. Primary wilderness or secondary wilderness formed by abandoning wilderness is gradually surrounded by the city. In order to promote the restoration of autonomous natural landscapes, the concept of re-wilding is applied to create wilderness. Rewilding aims to maintain or increase biodiversity, and to mitigate the impact of current and past human interventions by restoring species and ecological processes - that is, to regain freedom of nature. Wilderness appears in many forms in urban space, and in this paper, we mainly discuss the mining enterprises shut down due to urban transformation, as the landscape of mining wasteland restored to wilderness. This paper studies the ecological background of mining wasteland in Taiyuan City, analyses its transformation into the ecological construction mode of suburban forest parks, ecological parks and ecological restoration scenic spots, evaluates its effects in different management modes and different measures, and focuses on the ecosystem service functions of wilderness dominated by natural processes. Furthermore, this paper proposes a management model for restoration of free-willed ecosystems in the process of rewilding: 1) protecting wilderness through minimal intervention; 2) rationally balancing wilderness protection and development of recreational functions; 3) strengthening scientific research and culture of wilderness education. Finally, this presentation hopes to provide valuable guidance for the restoration of free-willed ecosystems in other brownfields by analyzing the typical case of restoration of mining wasteland.

Names and affiliations: HOU Shuyu (Tsinghua University), CAO Yue (Tsinghua University), YANG Rui (Tsinghua University)

Title of presentation/panel/round table discussion: Opportunities, Challenges and Related Practices of Rewilding in China's Rural Areas

Format: Oral presentation

ABSTRACT: With ongoing urbanization, many rural areas in China are facing phenomena such as depopulation, land abandonment, and inefficient expansion of development. China is in a pivotal period of land reform since 2015, previous studies mainly focus on development and cultivated land consolidation, and land management systems. This presentation systematically analyzes the issue of rural development in China from the perspective of rewilding, and proposes policy implications and practical recommendations. First, we comprehensively analyze the current situation of China's rural areas in terms of population, land use, and related policies, and summarize the significance of rural rewilding, as well as its opportunities. We further analyze the regional distribution of areas with continuous outflow of population and rapid reduction of residential areas, the relationship between the above areas and the key ecological functional areas, rural development and land consolidation related policies. Next, we analyze the key challenges of rewilding in rural areas and propose possible solutions. These include the following three main challenges: the impact of traditional perceptions, restrictions caused by current land policies, and difficulties in changing farmers' livelihood forms. From the perspective of rewilding, we sort out existing policies and studies, summarize the challenges of land marketization, economic and social development trends, etc., and propose corresponding strategies. Last, we select representative case studies of rural area rewilding, and summarize the effects of ecological restoration practices in recent years. Four ecological protection and restoration projects in Qilian Mountain (in western China), Changbai Mountain (in Northeastern China), Fujian Minjiang River Basin (in southeastern China) and Hebei (in northern China) are selected to further analyze the specific problems existing in the rewilding practice in China's rural areas, and to propose specific research and practical advice on their rewilding approaches.

Names and affiliations: CHENG Zhibin (Beijing Milu Ecological Research Center, Beijing), LI Junfang (Beijing Milu Ecological Research Center, Beijing), TIAN Xiuhua (College of Wildlife and Protected Area, Northeast Forestry University, Harbin, China), MENG Yuping (Beijing Milu Ecological Research Center, Beijing, China), WANG Libin (Beijing Milu Ecological Research Center, Beijing, China), ZHONG Zhenyu (Beijing Milu Ecological Research Center, Beijing, China), BAI Jiade (Beijing Milu Ecological Research Center, Beijing, China), LIU Dingzhen (Ministry of Education Key Laboratory for Biodiversity Science and Ecological Engineering, College of Life Sciences, Beijing Normal University, Beijing, China), LIU Yanju (Beijing Milu Ecological Research Center, Beijing, China)

Title of presentation/panel/round table discussion: The status of Père David's Deer protection in China

Format: Oral presentation

ABSTRACT: Reintroduction and ex-situ conservation are important ways to protect endangered wildlife. The Père David's Deer (*Elaphurus davidianus*) (aka the Milu) is listed on the IUCN Red List as Extinct in the Wild. The last population was lost due to flood and war at Nanhaizi of Beijing in 1900. Three founder populations, totaling 79 individuals, were reintroduced into Beijing Milu Ecological Research Center (BMERC) and Dafeng Milu National Nature Reserve (JDMNRR) in Jiangsu Province in China from England from 1985 to 1987. It has been 35 years since the first reintroduction of Milu to China. However, no information is available about the status of Milu protection in China. In this study, we conducted surveys in 228 wildlife protection units including zoos, nature reserves, etc. by on site visit, telephone consultations and literature searching from December 2017 to July 2019. Results are as follow: 1) Population number: a) the present population of Milu is 7961 in China, distributed in 81 locations, including 5 national nature reserves, and 66 zoos /safaris. b) The wild population is about 2,200, including 1000 pure wild individuals distributed in 5 locations. c) The populations in zoos were mostly small, and the populations in safaris reproduced well. 2) The protection of Milu in China mainly includes three stages: a) stage of population recovery (1985~1993). The number in BMERC and DJMNRR had each grown to 202 and 154 in 1993. b) Stage of establishment of ex-situ population (1993-present). BMERC and JDMNRR exported 496 and 78 individuals respectively, and established 39 and 12 ex-situ populations respectively. c) Stage of return to wilderness (1998-present), 23 individuals in Shishou Milu National Nature Reserve (HSMNRR) moved out because of flood in 1998, then developed into three pure wild populations. Since 1998 ten programs of wild releasing were conducted by BMERC and JDMNRR.

Rewilding for Life, Livelihoods and Love!!

Names and affiliations: Wouter van Hoven (North West University, South Africa), Roland Goetz (Technical Advisor to the Ministry of the Environment, Angola), Vance G Martin (WILD Foundation, USA)

Title of presentation/panel/round table discussion: Angola case study. The success of rewilding after the war. A nature-based solution for life, livelihoods and love

Format: Oral presentation

ABSTRACT: Eighteen years after rewilding an empty Kissama National Park, in the north of Angola, wildlife has thrived, life returned to emptiness and biodiversity was set on course to a full and balanced recovery. Local people got employment in the conservation and hospitality sectors, livelihoods improved, and tourism started and increased every year as Angolans and school groups developed a love for nature and wildlife. We will discuss how twelve African wildlife species, including elephants and giraffe, were airlifted to this wilderness under dangerous conditions. It took several four hour flights from South Africa and Botswana, in the height of the Angolan war, to the Kissama National Park and how their numbers have increased and benefitted life through biodiversity and livelihoods by means of tourism and employment.

Names and affiliations: Ulrich Stöcker (Deutsche Umwelthilfe- Environmental Action Germany), Katrin Schikorr (Deutsche Umwelthilfe- Environmental Action Germany), Artur Furdyna (Rewilding Oder Delta)

Title of presentation/panel/round table discussion: Implementation of the "Vision for a Wilder Europe" in the transboundary Oder Delta rewilding area

Format: Oral presentation

ABSTRACT: In November 2013, WILD 10 in Salamanca passed the "Vision for a Wilder Europe" with 11 organisations including Deutsche Umwelthilfe (DUH) and Rewilding Europe (RE) as first signatories. DUH and other partners started their rewilding work in the transboundary Oder Delta close to the Baltic Sea with a feasibility study funded by the German Federal Conservation Agency BfN in 2013/14. The "Vision for a Wilder Europe" with its 10 action points on wilderness protection and rewilding was one of the guiding documents for the Rewilding Oder Delta (ROD) Area in Germany and Poland., which was officially acknowledged as one of the main rewilding model areas of RE in 2015. A group of five nature conservation and tourism organizations in Germany and Poland - the first coalition of its kind in central Europe - cooperates on re-invigorating ecological processes on different scales in the OD. The presentation will show the efforts to use the potentials and to understand the barriers of making the vision a reality and the application of different rewilding models in this densely populated area during the last six years. It ranges from the policy framework on conservation and agriculture over conservation conflicts related to rewilding processes and human-wildlife interactions as an asset for biodiversity conservation and securing land area for rewilding and opportunities for nature-related businesses and communication.

Names and affiliations: A. Z. Andis Arietta (Yale University), Patrick Kelly (University of Montana)

Title of presentation/panel/round table discussion: Eco-evolutionary dynamics in Wilderness management: promises and challenges

Format: Oral presentation

ABSTRACT: Over the past few decades, biologists and ecologists have come to recognize that evolution can happen on much faster timelines than previously considered. Much of this revelation was driven by observing the ability of organisms to rapidly adapt to human impacts in the industrial and post-industrial age. Prior to this realization, researchers thought of ecology as a play enacted on a static evolutionary background. Now, we know that contemporary evolution can lead to reciprocal impacts on ecology, creating feedback loops (i.e. eco-evolutionary dynamics) and altering ecological and evolutionary trajectories. In other words, eco-evolutionary trajectories are contingent on their own intrinsic character as well as external forces. This poses a problem for conceptions of wilderness that rely on a relatively static historical reference, and even more so for restoration and rewilding projects that hinge on our ability to theoretically project the past into the future.

Names and affiliations: Isidore Gnonlonfoun, Laboratory of Biomathematics and Forest Estimations (LABEF) & Laboratory of Applied Ecology (LEA), Department of Environment Management, Faculty of Agronomic Sciences, University of Abomey-Calavi, Cotonou, Benin

Title of presentation/panel/round table discussion: Elephants' trophic interaction and state of ecosystem functioning in relation to climate change disturbances in Pendjari Biosphere Reserve, West Africa

Format: Oral presentation

ABSTRACT: Despite the conservation potential of protected areas, mammal herbivory and climate change can impede ecosystem processes and biological diversity conservation. This study combined semi-structured interviews and plots inventory to assess elephants' and climate change's impacts on the ecosystems in the Pendjari Biosphere Reserve in West Africa. A total of 112 respondents, including reserve managers and experienced local people of the Reserve were interviewed. Stakeholders' field assessment of the state of the ecosystems was carried out and mapped. In addition, twenty transects of 5000 m of length and 200 m of width were explored to record the abundance of the wild fruit trees. Ordered logistic regression was performed to assess perceived trends in elephants' feeding behavior with regard to its perceived driving factors. Indices for ecosystem functionality and decline were also computed. Conservation status for wild fruit trees was determined through an index of prioritization. Results showed that climate change increased 6.61 times elephants' browsing of the wild fruit trees and impeded trophic interactions. Overall, the density of the wild fruits trees varied between 0.25 and 23 stems/ ha for *Vitex doniana* and *Vitellaria paradoxa* respectively. *Adansonia digitata*, *Vitex doniana*, *Lannea acida*, *Parkia biglobosa*, *Lannea microcarpum* are priority wild fruits trees for measures of conservation. Seventy-eight ecosystems were assessed and showed functionality decline equal to 70.71 %. Results are discussed in line with ecological restoration of affected ecosystems in the Pendjari Biosphere Reserve.

Rewilding, reintroductions, restoration to protect free-willed ecosystems: putting things back that we have caused to be missing

Names and affiliations: Georgios Georgiadis (Instituto Araguaia de Proteção Ambiental, Brasil), Silvana Campello (Instituto Araguaia de Proteção Ambiental, Brasil)

Title of presentation/panel/round table discussion: Can Sustainable Use Protected Areas Ensure the Protection of Wilderness?

Format: Oral presentation

ABSTRACT: Sustainable use areas comprise 68% of all Brazilian protected areas (PAs). Can they ensure the protection of wilderness? For 30 years we have believed that combining protection of biodiversity and human activities could benefit both. Thus, in Brazil and other countries, most PAs created in this period are sustainable use areas. Recent studies and our own experience in the field alert us that this idea is misguided:

- In the Brazilian Amazon, the top 50 most deforested PAs are all sustainable use Environmental Protection Areas, Extractive Reserves, and National Forests, corresponding to 34% of all deforestation, versus 8% in strict protected areas. Even areas that are not deforested in sustainable use PAs lose biodiversity due to hunting, fishing, and other impacts from people.

- In the Cerrado, 60 PAs cover 8% of the biome, but strictly protected areas cover only 3%. The deforestation rates inside sustainable use PAs are similar to outside PAs.

- In every PA we visited over 30 years of conservation work in Brazil, the presence of humans, legal or otherwise, was associated with defaunation and “silent forests”.

- At the Araguaia River, where we have worked to protect ecosystems and top predators for 20 years, this protection is only feasible in strict PAs, like uninhabited Cantão Park. In sustainable use PAs predators and their prey decline and disappear, and effective countermeasures are difficult where people have free access.

Sustainable use PAs are important as buffer zones, as links in corridors, and elements of a mosaic, but the scientific data have shown that alone they cannot protect the full range of biodiversity.

Names and affiliations: Roshni Yathiraj (ReefWatch Marine Conservation), Nayantara Jain (ReefWatch Marine Conservation), Robert Seventer (Coral Aid)

Title of presentation/panel/round table discussion: Re(e)Generate: rehabilitating and rewilding coral populations in the Andaman Islands

Format: Oral presentation

ABSTRACT: Coral reefs are declining world over due to various environmental stressors. Reefs in the Andamans have seen a 16% decline of live coral cover in the last 8 years. Apart from frequent bleaching events due to our changing climate, coastal development and an ever growing tourism industry are amongst the main causes of this deterioration. Re(e)Generate is a project started in 2016 to help rehabilitate and rewild coral populations surrounding the islands. Corals use both asexual and sexual methods to reproduce and based on this we have split this larger project into two wings. Re(e)Build: This wing concentrates on exploiting a coral's ability to asexually reproduce through fragmentation and budding. Since the last 3 years we have been working on setting up a pilot artificial reef in Chidiyatapu, South Andaman Island, developing and fine tuning our methods. Nine frames made of iron rebar have been sunk and coral fragments that have naturally broken off from their larger colonies were collected from adjoining reefs and tied onto these structures. To aid and speed up the growth of coral, the structures were attached to autonomous mineral accretion devices (the first of their kind in the world; designed and built by Robert Sevenster). As an additional aspect, we are also testing the technique of microfragmentation, developed by Dr. Vaughn in our wet lab. Fragments of coral are brought in and broken into smaller pieces, this forces them to grow faster to accommodate for predation. These fragments once grown to a specific size will be transplanted onto our artificial reef. Re(e)Grow: This wing involves finding out when corals spawn in the Andaman Islands and using the spawn to artificially fertilize genetically stronger coral.

Names and affiliations: Dmitry Gorshkov (WWF Russia), Vladimir Krever (WWF Russia)

Title of presentation/panel/round table discussion: Restoration of ecosystems in biodiversity hotspots in Russia

Format: Oral presentation

ABSTRACT: Rare and endangered species of animals and plants are the most fragile and important part of the biological diversity of our planet. The disappearance of even one species from the ecosystem can lead to the disruption of its integrity and stability, and in some cases to its destruction. WWF is actively working to restore ecosystems in biodiversity hotspots such as the Russian Far East and the Caucasus. One of our priorities is to restore the natural structure of ecosystems, including reintroduction of extinct or endangered species such as big cats (species that are at the top of the ecological pyramid and are indicators of its sustainability) and European bison (environment-forming species). WWF's work is aimed at preserving rare species of animals by: creating new and supporting existing specially protected natural territories; optimizing the legislative and regulatory framework for the protection of rare species; combating poaching, introducing methods of sensitive (rational) nature management in rare species' habitats. Over the last decade, populations of rare mammal species have been intensively restored in Russia. At the initiative and with the support of WWF Russia runs a number of projects: restoring (reintroducing) the Persian leopard and European bison in the Caucasus, reintroduction of Caspian tiger in Kazakhstan and Amur leopard in the Russian Far East (southern Sikhote-Alin). Reintroduction is an effective conservation tool but its use needs rigorous justification, risk assessment, government support and the involvement of a large number of partners.

Names and affiliations: Carol Miller (USDA Forest Service, Aldo Leopold Wilderness Research Institute)

Title of presentation/panel/round table discussion: The human-natural fire regime in wilderness

Format: Oral presentation

ABSTRACT: In the US, there is wide recognition that fire is a natural, often very beneficial, process that many ecosystems simply cannot do without. In wilderness, this recognition has manifested into a practice of consciously allowing lightning-ignited wildfires to burn in many wilderness areas with minimal interference by managers. However, even in wilderness areas where this practice has become common, land management agencies still struggle with integrating the ecological role of fire with the needs and desires of human communities. One contributor to this struggle may have to do with the US Wilderness Act and its implicit assumption of a dualism of humans and nature. Indeed, one motivation for the US Wilderness Act was the desire to protect wilderness from human domination. The legislation defines wilderness such that humans are only visitors who do not remain or otherwise partake in the ecosystem function. This view runs counter to multiple lines of evidence that suggest that humans strongly influence wilderness fire regimes. Although the human influence on fire activity inside wilderness has been shown to be weaker than it is outside wilderness, analyses have also quantified the substantial influence of the human footprint on fire regimes inside wilderness. This dualistic view also runs counter to the historical facts about how humans interacted with these landscapes prior to the European settlement of North America. Humans inhabited the lands that today are designated wilderness. And yet, western science typically describes historical fire regimes in terms that ignore the human use and management fire that helped shape these landscapes. There is potential for reframing wilderness fire research questions to better address the important and unavoidable role humans play in wilderness fire regimes.

Rewilding, reintroductions, restoration to protect free-willed ecosystems: Restoring biodiversity through protection

Authors and affiliations: Sachin Sridhara (NPDP, NCBS, Bangalore), Bhuvaneshwara H C (MoB Team leader, Subramanya, Karnataka), Meghna Krishnadas (LaConES, CCMB, Hyderabad), Swapna Nelaballi (University of Michigan, USA)

Title: A case for using multiple species to conserve a mixed-use, important biodiversity corridor in the Western Ghats.

ABSTRACT: Western Ghats is a globally recognized biodiversity hotspot with the highest human densities in the world. Only 9% of the Western Ghats area is protected, but areas between these protected areas are important links that often harbour rich diversity. Worryingly, forests are being lost in these intervening areas. The Bisle-Charmadi landscape (henceforth BCL) in Karnataka exemplifies unprotected forests that form crucial ecological links to important forest complexes - Kudremukh and Bhadra Tiger Reserves to the North, and Pushpagiri and Talakavery Wildlife Sanctuaries to the South, ensuring connectivity across the larger Western Ghats region. However, land-use in BCL is unplanned and often detrimental to nature. For example, in this ~700 sq.km. landscape dotted with small to large commercial farms, large-scale infrastructure projects such as mini hydroelectric dams (8 in total), road widening, and river diversion have been commissioned, sometimes despite opposition by local communities. Given this backdrop, our aim is to arrest loss of forests and biodiversity in BCL and facilitate restoration over the long-term to ultimately ensure that BCL remains an ecological link and a source of vital ecosystem services. We argue that in mixed-use landscape such as BCL, a multi-species conservation model could be an efficient approach in including different aspects of the landscape, particularly when the species are likely to have minimal conflict potential but have high conservation value. Specifically, we use four species as flagships – lion-tailed macaque, Nilgiri marten, Malabar pied hornbill and smooth-coated otter – to drive our initiatives. We provide broad information on our approach, which is participatory, involves various stakeholders and includes collecting baseline data on species and threats, creating awareness, designing strategic interventions, and monitoring our efforts.

Names and affiliations: ZHENG Xiaodi (Tsinghua University), WU Xi (Tsinghua University)

Title of presentation/panel/round table discussion: The cognition and value of Brownfield Rewilding

Format: Oral presentation

ABSTRACT: The concept of "urban wildness" and "industrial nature" expand the traditional scope of wilderness, providing the public a new perspective. "Brownfield Rewilding" refers to the natural succession process in abandoned brownfields where human exploitation has been minimal for a long time. Taking the case "Natur-Park Südgelände" in Berlin, Germany and the case "Jiangyangfan" in Hangzhou, China as examples, this paper discusses the unique ecological service value of brownfield rewilding in highly built-up urban areas. Due to raw materials shipment from faraway locations, seeds mixed in them provides non-local species in brownfield rewilding areas which become rich habitats to be preserved. Under the circumstance of "suppress the second industry and develop the third industry" policy, restricted economic development and difficulties in brownfield remediation, quite a number of urban brownfields in China experience rewilding process after being desolate. The acknowledgement of the value of brownfield rewilding and how it is to be incorporated into design strategies are to be examined. The impact of urban economy, public aesthetics, and social cognition on "brownfield rewilding" in China are to be discussed in its specific cultural context. It is suggested that landscape architects shall take appropriate actions of protection, intervention, restoration and design in regeneration of brownfields to fully respect the value of brownfield rewilding in research, public education and recreation.

Authors and affiliations: Kamakshi Tanwar, Ayan Sadhu, Yadvendradev Jhala (Wildlife Institute of India)

Title: Does randomness always provide a representative sample?- comparing random and trail-based camera trap placement for studying species characteristics

ABSTRACT: Studies focusing on population estimation are essential to obtain information on population status of species to formulate apt management and conservation actions/strategies. Camera traps have become increasingly important and widely used for wildlife enumeration. They have been mostly used for estimation of species which can be individually recognized and requires placement of the cameras at locations frequented by target species to increase captures. We often use this information to draw inferences on population characteristics/behavior/traits of non-target species. Inferences solely based on these data may provide a biased picture of non-target species. On the other hand, along with accurately estimating ungulate populations, randomly placed cameras are also being used for activity studies and inventorying animal assemblages. Here, we try to discern whether we can shift from conventional trail-based camera placement to randomly placed cameras for estimating population characteristics. For this purpose, we look into the effect of different camera trap placement on depiction of species abundance (indices), their activities and detectability. We placed camera traps in animal-use trails (n=106) and random locations (n= 33) with respect to animal movement following 2sq kms grid in core area of Ranthambore Tiger Reserve. During the study period, we recorded 25 species in the trail cameras and 20 in the random cameras, the later was a subset of the former. The species accumulation was satiated at 33 days for trail and at 14 days in case of random cameras, where it failed to gather all the species. Abundance indices of ungulates were comparable between trail and random cameras, whereas territorial animals like carnivores were far less captured in random cameras. Ungulate activities were recorded primarily in the day with trail cameras and throughout the day in random cameras. We concluded that other than activity patterns, trail-based cameras are capable of accurately providing a good representative sample of the population.

Authors and affiliations: Debi Goenka (Executive Trustee, Conservation Action Trust)

Title: Using Legislation to protect Wildlife in India

ABSTRACT: Despite being one of the most densely populated countries in the world, and despite the huge challenges and pressures faced by India to cater to the needs of its population, India has an amazing track record in protecting its wildlife and biodiversity. India has a number of laws that help in protection of our natural resources. These laws have been framed over the years, and have withstood the challenges and threats that they have been subject to over the decades. However, the major problems confronting us today are not just the wildlife poaching and trade, but the steady destruction of biodiversity and wildlife habitats. Ironically, most of the loss of wildlife habitats is the result of the sins of omission and commission of the Government itself. Lack of enforcement of our wildlife and environmental laws is another major factor leading to the loss of biodiversity and wildlife habitats. This paper will show how our legislation has been used by the author to protect National Parks, Sanctuaries and forest areas in India. Some of the case studies that will be discussed will be the protection of the Sanjay Gandhi National Park in Mumbai, the protection of mangroves in Maharashtra, the denotification of 500 square kilometres of Melghat Tiger Reserve, and the use of the Environment Protection Act to create Eco Sensitive Zones around all National Parks and Sanctuaries in India. The presentation will also cover the challenges faced by new laws such as the Forest Rights Act, and how the incorrect application of this law is leading to large scale destruction of India's forests.

Roundtable Discussion: Nature-based solutions: an ecological planting model to combat desertification in arid grasslands of China

Names and affiliations: ZHU Ling (Shenyang Jianzhu University), WANG Rui (Shenyang Jianzhu University)

Title of presentation/panel/round table discussion: Bring the wilderness back to the area of human activity, Study on Optimization of Urban Planting based on Ecological Function Evaluation of Wild Area.

Format: Round table discussion proposal

ABSTRACT: As we all know, China is a large country in the wilderness area. From the perspective of basic pacification, China has more than 40 % of wilderness land. This has brought us unprecedented wildlife resources and a good eco-efficient living environment.

In the current stage of the plant industry in China, the total number of plant varieties in circulation does not exceed 2000. Among them, the most affected is the landscape industry. As a result, the green space system in the densely populated areas of human activities in the process of urbanization is fragile. Low biodiversity cultivation and monolithic plant application patterns make the patch ecosystem function of the same area urban green space system much lower than the ecosystem function of green space in the original wilderness.

In this study, the biomass per unit area of planting (experimental sample per unit area of plant) and biodiversity were systematically measured through the planting forms in the green space system in urban areas of Shenyang, Liaoning Province. Horizontal comparison of the number of plant species, plant biomass per unit area, and biodiversity in the wilderness area within the same unit area (using the unit area as the experimental sample of plants. Through comparative study of the corresponding basic data, an attempt is made to review the method of planting in urban green space systems. Through the rich landscape planting design method to find a way to bring original wilderness into the urban space. Bringing the wilderness back to the gathering area of human activities can arouse people's inner feelings that belong to nature, awaken people's love of nature and more directly influence the return of nature after being away from the wilderness.

Roundtable Discussion: Extending conservation outside of strictly protected areas in India

Names and affiliations: Dr. Raghu Chundawat (Wildlife scientist, Baavan, India), Professor Stewart Thompson (Conservation ecologist, Oxford Brookes University, UK), Julian Matthews (Chair, TOFTigers, UK and India), Bittu Saghal (Editor, Sanctuary Asia, India).

Title of presentation/panel/round table discussion: Rewilding India outside of strictly protected areas

Format: Round table discussion proposal

ABSTRACT: Nature-based tourism (NBT) has boomed in India over the last 20 years, providing a substantial conservation-based economy to rural communities bordering many parks, highlighted by the recent Tiger Census. However, its present format is often poorly envisaged, planned and implemented, and often fails to offer the potential long-term solutions to critical conservation challenges. A key issue is the lack of a financial conduit whereby funding and the economic enterprises generated from NBT filter down to local communities in a way which secures that land outside Strictly Protected Areas so they can be adequately managed to meet the sustained needs of both local communities and wildlife in tandem.

The central tenet of the presentation (or round table) will be to put forward a format of Indian-derived, community-based 'conservancies' for rewilding forest landscapes outside of strictly protected areas, which promote the protection of wildlife on Government and/or privately-owned landscapes. The presentation (or round table) will highlight the key issues surrounding the delivery of such a legally based format, including:

- Which conservancy model(s) will work best for India and why?
- What can we learn from existing conservancy approaches elsewhere?
- Governance structures of the conservancies?
- How to calculate the amount and locations of lands incorporated into conservancy agreements?
- Which land management prescriptions will be required?
- How best to monitor the conservancies once established?

Voices of the Wild: You are going to love this story!

Names and affiliations: Swati Thiyagarajan (Conservation and Campaigns team, The Seachange Project)

Title of presentation/panel/round table discussion: Tell me a story

Format: Oral presentation

ABSTRACT: "in the end we will only conserve what we love, we will love only what we understand and we will understand only what we are taught" Baba Dioum.

Storytelling is key to engaging larger society in a global movement to nurture this wonderful planet we have been given. After twenty years of telling stories, reporting on nature and content creating for several big wildlife and nature campaigns, I can say that with confidence. While science is imperative in knowing and learning about the natural world, it needs to be translated into stories to reach a wider audience. Humans are hard wired to respond to stories. We spent tens of thousands of years around a fire in a community orally crafting our experiences. Today a combination of visuals and words drives our central behavior. It is unfortunate that most narratives exclude science, while extolling on consumerism, brands, life style needs in complete contravention of what we should be paying attention to. Children recognize more brands than birds in a park. We think the economy is the most important sector for human survival and not ecology. We believe terrorism and immigration are bigger threats than Climate Change. It is because those narratives are powerfully sold, funded, curated and on every media channel and medium every day. It needs a counter narrative and it's needed now in a collaboration between science and story tellers. We can change behavior and we need to do it now. It all lies in what our story is and how well we tell it.

Names and affiliations: Ken Chelimo

Title of presentation/panel/round table discussion: Reaching out to Conserve the Endangered Colobus Monkey in Diani, Kenya.

Format: Oral presentation

ABSTRACT: The rare angolan white and black Colobus Monkey is an endangered species in Diani, Kenya. The primate faces extinction from their natural habitat in Diani, along Kenya's coastal forests due to destruction of forests and new developments to replace the natural habitat. The primates have also been threatened by electrocution, accidents and poaching by the local community which value their skins for cultural use. This therefore calls for concerted efforts to conserve the few remaining animals in their natural habitat along with treating those injured/neglected/abandoned before releasing them to the wild. A sustained communication strategy to reach out to those concerned like the government, conservationists, prospective donors, researchers etc., is urgently needed in this important conservation.

Names and affiliations: Pooja Bhale

Title of presentation/panel/round table discussion: Ecological Behavioural Change - Spiritual Ecology

Format: Oral presentation

ABSTRACT: People will only do as much as they are aware of. The need then, is to raise the existing bar of awareness and bring people into a new consciousness. The problems plaguing our planet are in reality those of greed, apathy and selfishness. Those that are not connected to nature perhaps will not be compassionate to her needs or their own even. Every individual has the intrinsic capacity to be compassionate, kind and loving. However in our daily grind we get caught up and carried away. The need to look within is ever more necessary now in our urban and time bound lifestyles.

Development is inevitable just as it is necessary; the key though is to be sustainable and sensitive. There needs to be a global reformation of our lifestyles in order to accommodate balance. There is a need to bring about a change in the very behaviour of people. We call this Ecological Behavioural Change (EBC). The concept is to work with the mind, tap the resources within and heal the self. A person who is kind to themselves would automatically be kind towards the Earth. People are just people, there is no good and bad, there just is. It is what we do that defines our impact. I have been working on rekindling kindness and compassion since 2012 and The Farm, our flagship project is based on the 3 pillars of love, awareness and learning. A working model of EBC.

Names and affiliations: Colin Starkevich

Title of presentation/panel/round table discussion: Colin Starkevich and The Grassland Series: Connecting to Nature and Society

Format: Oral presentation

ABSTRACT: As a 30 year old visual wildlife artist I will deliver an inspirational presentation about the story behind my ongoing series of artwork called The Grassland Series depicting Canada's natural Grasslands region, additionally speaking about the importance of the programs and networks which largely assisted in the development of this series including why I believe it is important as a society to continue developing programs promoting spending time in nature. Informing environmental leaders about the importance of youth led organizations and connecting with one's local natural surroundings will be discussed. I will give personal examples of how doing so can give individuals, especially youth, a sense of belonging and discovery of their own strengths and abilities. I will discuss the importance of youth led organizations which act as positive networks of like-minded individuals to share ideas with, support each other, and develop programs on a local and international level to develop the unique abilities of young people while doing good for the natural state of the planet and promoting spending time in nature. I believe these organizations can positively impact individuals' lives in a strong way to live meaningful lives with purpose creating new environmental leaders for today and tomorrow. This presentation will be based off personal experiences and how it has turned me into the artist I am today and how I developed a profound connection to the Canadian Natural Grasslands region.

Voices of the Wild: Art, photography, words and music to tell stories

Names and affiliations: The Bugun Community and Nandini Velho, Ram Alluri, Millo Tasser, Umesh Srinivasan (Advisory Board of the Singchung Bugun Village Community Reserve)

Title of presentation/panel/round table discussion: Art for Conservation: A case study from Eaglenest Wildlife Sanctuary

Format: Oral presentation

ABSTRACT: Although trained as a wildlife biologist, my greatest passion is melding science with the insights of artists, natural-resource managers and residents. I took up challenges on the boundaries of biology, economics and visual anthropology. My research has spanned diverse themes, from rainforest dynamics, to the impact of malaria on forest management, to how militancy affects forests and livelihoods, and recreating the history of a forest with a graphic artist and residents. I have observed that science is not always the mainstay of environmental governance. In addition, I work with resident tribal communities, contributing to village council meetings and holding wildlife-awareness camps for students around Pakke and Eaglenest Wildlife Sanctuary. I led a group of nature-educators, graphic designers, engineers, artists, artisanal workers and forest department personnel to create one of the first nature interpretation centres for Pakke and am part of a team that is pioneering the use of Virtual Reality technology in conservation education in India. I am presently part of a team of film-makers and educators that for the first time in India are using virtual reality for nature education. Our preliminary survey with 69 children from the local schools around Eaglenest Wildlife Sanctuary, found that although they live in a vicinity of 5 km of the protected area, 88.4% were visiting Eaglenest for the first time. However the experience of watching wildlife through 360 degree headsets made 98.6% of students want to explore Eaglenest even more. In this presentation, I will take up Eaglenest Wildlife Sanctuary as a case-study that has led to multiple forms of engagement - from the Bugun community declaring 17 sq kms of their forest area a community reserve to a collaboration among stake-holders.

Names and affiliations: Aishwarya Sridhar-

Title of presentation/panel/round table discussion: Photography- a powerful tool in wildlife protection

Format: Oral presentation

ABSTRACT: A powerful tool for documenting biodiversity is photography. It allows one to document the most important characteristics of any living animal and its actions. The evolutionary aspects of species have become known through image capturing. All this fuels wildlife conservation. Underwater or landscape photography; all these specialisations are different paths leading to one ultimate goal- wilderness protection. The use of powerful images can generate public awareness at both the conscious and subconscious levels—a kind of inner inspiration that will elicit concern and emotion that can direct human behavior. Photographs can give voices to species and wild places facing danger globally. It also contributes in a great way to illustrate the interaction between people who depends on and values nature.

‘A picture can help save the natural world.’ This quote may seem unbelievable at first but there are several examples of this turning into reality. One such situation happened at the Panje wetlands at Uran, Mumbai. Images with GPS data were used to protect the wetland from being filled for development. Around 2500 fishermen are dependent on this 523-hectare wetland spread between the villages of Panje and Dongri where over 3000 migratory birds visit every year. Using images as pictorial representations of the life thriving there, the presenter hopes to declare Panje as a Community Conservation Reserve where the local fishermen will act as para-ecologists protecting the last wilderness of Uran. The presentation aims at creating awareness about the power of visuals which can be used to effect positive change in wilderness protection. The paper also aims to use the Congress as a platform to help preserve the last remaining wetland of Uran thereby ensuring that the life and livelihood of the people there continue forever.

Names and affiliations: Shady Rabab (Rabab Luxor), Farah Kobaissy (Rabab Luxor)

Title of presentation/panel/round table discussion: Environmental Art: the case of the Garbage Music

Format: Oral presentation

ABSTRACT: This presentation focuses on the use of art as a means to better connect humans with nature. It is based on personal experience in the Garbage Music project which teaches youth and children in the local community of Luxor, how to turn waste into music. By turning life-less waste into lively music, the project delivers strong environmental messages. It inspires and showcases the creative alternatives and possibilities that recycling and managing waste could have and their impact on the environment and art respectively. The project is based on a principle that often, to successfully engage publics, we need to reach them in creative ways and with messages that resonate with them as individuals and communities, building their personal connection to this issue. In this presentation, focus is on how art can mobilize local and affected communities and build awareness around the environment to build stronger connections with nature.

Names and affiliations: Crista Valentino, The WILD Foundation/CoalitionWILD

Title of presentation/panel/round table discussion: Your Metrics Are Killing Your Impact

Format: Oral presentation

ABSTRACT: CoalitionWILD Founder and Director Crista Valentino will give an oral presentation on how requiring specific measuring systems is stifling creativity and the advancement of ideas, diminishing potential impact and motivation. While quantitative outcomes are important to track, funding and fellowship applications (to name two of many) rely heavily on an initiative's ability to show their short term outputs and outcomes in numbers that relate to clear before and after differences. An applicant must be able to list, specifically, what they will do with their time, money, and notoriety if chosen to be the recipient of an opportunity, and if the applicant strays from this pre-set path at all they risk losing their funding. Supporters search for stability, consistency, and results, however this strict set of guidelines is inhibiting the evolution of ideas, practices, or methods. Fearful of straying from the idea that gave them funding or support, initiatives often plug along unchanged for years, increasing their impact numbers but never jumping from the deeply worn grooves of year after year repetition of work. If we want real, global change to occur, we must learn how to trust the people you are working with, enable risk taking, encourage failure, and invest for multiple years from the beginning. We see this take place in the social venture/start up/tech world, and it's time to transfer this to the environmental sector. Examples of how this works will be shared, taken straight from CoalitionWILD's Ambassador program of under 35 year old emerging leaders self-designing environmental solutions for their communities.

Voices of the Wild: Telling the story about land ethics

Names and affiliations: Sofia Heinonen, Tom Butler (Tompkins Conservation)

Title: Patagonia rewilding: developing a binational, transboundary protected area

Format: Oral presentation

ABSTRACT: Patagonia, the windswept region at the farthest reaches of South America, has become globally known as an iconic, untamed land, increasingly popular as a destination for adventure travel. Less known is the region's cultural and land-use history, in which dramatic changes occurred following European settlement. The area's indigenous peoples were largely displaced or destroyed, deforestation prompted significant erosion and soil damage, and wildlife populations were decimated through overhunting and forage competition with introduced domestic livestock. Vital ecological actors such as guanacos (the formerly abundant wild camelid of the region), pumas, and Andean condors suffered dramatic population declines. While parts of Patagonia, particularly upland areas of the Andean cordillera, have remained largely free of human influence, large expanses of Chilean and Argentine Patagonia have seen extensive degradation to soils, biodiversity, and wildlife abundance since the introduction of pastoral agriculture. Conservationists are working to counter these trends via the establishment of protected areas, associated species augmentation and landscape rewilding projects, and related efforts to local economic vitality explicitly linked to wildlands protection. The U.S.-based NGO Tompkins Conservation, working through affiliated nonprofits in Chile and Argentina, has helped catalyse this program of public/private collaboration, which has resulted in the creation of Patagonia National Park–Argentina and Patagonia NP–Chile, through acquisition and aggregation of private lands that were then donated to the public. Ambitious and ongoing ecological restoration and species conservation efforts have focused on the globally imperiled hooded grebe and huemul deer, as well as Andean condors, pumas, and other species. A captive breeding program to augment the diminished population of Darwin's rheas has doubled the local population. The overarching effort has met and overcome significant political, cultural, and ecological challenges, offering a case study useful to wilderness conservation efforts at all scales.

Names and affiliations: Elliot Connor (Human Nature Projects). Human Nature Projects is a charity aiming to reconnect people to the planet, creating a conservation community which is both accessible and empowering to those involved. He is one of the 2019 Youth Ambassadors to CoalitionWILD, the Australian Country Mobiliser for the Youth for Our Planet movement, Ambassador to GARN, the Laurence Anthony Earth Organization and a recent addition to the Jane Goodall Institute Australia's National Youth Leadership Council.

Title of presentation/panel/round table discussion: A Global Vision for Conservation Community

Format: Oral presentation

ABSTRACT: Community, Collaboration, Creativity, Conservation, Connection: these words are bandied around more and more in discussions of the future of the field- but what do they really mean? How can these 'holy grails' of environmental management be achieved, and what effect could they truly have? In June 2019, 16-year-old Elliot Connor from Sydney established a global conservation charity by the name of Human Nature Projects. This charity had a vision for a New Nature accessible to and appreciated by all- promoting public engagement and volunteering, educating our youth, and dispelling the rampant misconceptions of animal inferiority that plague our society.

Less than one year on, the movement is flourishing, with over 2000 volunteers in some 100 countries across the globe. With national teams supporting the roots and shoots of our upcoming environmentalists and networking with our global community as easy as a click of a button, the future for ourselves and our wild places is suddenly looking significantly brighter. As Elliot says: "Our future lies not in our hands, but in our imagination. An imagination grown by the many, not by the few."

Names and affiliations: Akriti Khadka (Texas A & M University), Christine Jie Li (School of Natural Resources, University of Missouri), Sonja Wilhelm Stanis (School of Natural Resources, University of Missouri), Mark Morgan (School of Natural Resources, University of Missouri)

Title of presentation/panel/round table discussion: UNPACKING THE POWER OF PLACE-BASED EDUCATION IN CLIMATE CHANGE COMMUNICATION

Format: Oral presentation

Content (Maximum 300 words, for possible posting in the Symposium program after acceptance): Climate change is one of the most serious environmental issues in modern society. Human activities play a major role in speeding up this process, but its complexity often thwarts communication and education efforts. Some research suggests that place-based approaches are effective because they feature local and observable impacts, thus connecting human behavior with climate change. This pilot study developed and evaluated the efficacy of a place-based education toolkit using a one-group, pre and post-test design. The study involved 29 high school students who participated in a one-week, summer education program at Prairie Fork Conservation Area in mid-Missouri, USA, in 2018. Use of place-based education was hypothesized to promote knowledge, awareness, responsibility, hope, and behavioral intention of participants regarding climate change. Results suggested that the program was an effective way to increase understanding of climate change, as evidenced by significant increases in a variety of measures. Implications for using place-based education will be discussed.

Names and affiliations: Dr. Jyoti P Das (EDGE of Existence Regional Projects Manager, Asia, Zoological Society of London), Charlie Debenham (EDGE Fellowship Coordinator, Zoological Society of London), Cassandra Murray (EDGE Social Dimension Specialist, Zoological Society of London), Caroline Park (EDGE of Existence Projects Coordinator, Zoological Society of London), Dr. Davi Teles (EDGE of Existence Regional Projects Manager, Latin America & Caribbean, Zoological Society of London), Dr. Fran Cabada (EDGE of Existence Marine Biologist, Zoological Society of London), Rikki Gumbs (EDGE of Existence PhD Scholar, Zoological Society of London), Olivia Couchman (EDGE of Existence Conservation Capacity Manager, Zoological Society of London), Dr. Claudia Gray (EDGE of Existence Conservation Science Manager, Zoological Society of London)

Title of presentation/panel/round table discussion: Capacity building to conserve unique evolutionary history worldwide: insights from the EDGE of Existence programme

Format: Oral presentation

ABSTRACT: In developing countries, where most of our biodiversity exists, there are insufficient resources and trained professionals to implement effective conservation planning and implementation. Building local capacity for conservation is therefore key to successful nature-based solutions for wilderness and communities. The EDGE of Existence programme at the Zoological Society of London has worked to build the capacity of young conservation professionals across the world since 2007. Using a scientific framework to identify the world's most Evolutionarily Distinct and Globally Endangered (EDGE) species, the EDGE of Existence programme highlights and works to protect the most unique and rare species on the planet.

We will present insights from the last 12 years of the EDGE programme to address the question "how do we achieve the conservation of the wild nature that we need to survive?". Our programme has now trained more than 100 young conservationists and provided the supervision and financial support for these individuals to carry out research and conservation work on priority EDGE species. We will summarise the past successes, key developments and lessons learnt from our work to highlight the central role of local capacity building in conservation and how this can be done most effectively..

Voices of the Wild: Stories to change behaviors

Names and affiliations: Till Meyer (Germany)

Title of presentation/panel/round table discussion: From Wilderness to Wildness and Back Again — Aldo Leopold's Transatlantic Odyssey

Format: Oral presentation

ABSTRACT: Aldo Leopold (1887 – 1948) is best known as author of the book *A Sand County Almanac*, published posthumously in 1949, a work which is still considered an almost holy book in conservation circles due to a curious blend of practical and prophetic insights. Other merits include conservation impulses such as the initiation of the world's first federally protected wilderness area. Also the creation of university chair of Wildlife Management (1933) and field of Environmental Ethics and Restoration Ecology (approx. 1970) are credited to his lasting influence which spans the field of conservation reaching from large protected "pristine" areas to systematic rewilding efforts of the working (read: cultural) landscapes. His conception of an unwritten moral code, which he termed "Land Ethic", serves as common denominator between wilderness attitude and sustainable land use practice. Even though the roots of these efforts can be traced back to early periods of Leopold's lifetime, important conceptual impulses stem from Leopold's journey to Germany in year 1935. The title of my presentation refers to the interrelationship of large protected wilderness areas and the urban and agricultural wild, which in many ways cannot be separated from each other philosophically nor scientifically. In part this also refers to the campaign "Nature needs Half". I have been researching Aldo Leopold's life for quite some time ever since seeing the German translation of *A Sand County Almanac* to publication in 1992. My current most recent efforts on this climaxed in the creation of an exhibition on Aldo Leopold and Wilderness (March 18 - August 6, 2019) for the German Museum of Hunting and Fishing.

Names and affiliations: Salil Subedi (Earthbeat Live, Nepal)

Title of presentation/panel/round table discussion: Reflections from a Nature Stage

Format: Oral presentation

ABSTRACT: On one hand, the cultural and biodiversity narratives of some ecosystems (e.g., the Brahmaputra river and the Bardia grasslands along the Karnali river) may be under-represented in the values and the threats these ecosystems face. On the other, there are some ecosystems that are better studied (e.g., rainforests of Pakke Tiger Reserve where the biology of hornbill species are studied) that are likely to benefit more from a language of artistic translation. As a performing artist and director of Earthbeat Live! working for over a decade with nature, wildlife and conservation dramas, I will present three case studies from the Brahmaputra river, the grasslands of Bardia and the rainforest of Pakke Tiger Reserve. I will demonstrate the intersection between imagery and compelling local narratives that democratizes information about these ecosystems. From this work, we are able to meaningfully root environmental discourse in the realities of a contemporary society in Nepal as well as India.

Names and affiliations: Dr. Michael Slattery (Institute for Environmental Studies, Texas Christian University), Dr. William Fowlds (African Rhino Conservation Collaboration and Amakhala Game Reserve)

Title of presentation/panel/round table discussion: Genius Loci: Unique learning places among the wildlife in the Eastern Cape, South Africa

Format: Oral presentation

ABSTRACT: There are locations in the world where a unique combination of people, place and purpose intersect providing opportunities of intellectual growth, creativity and innovation. We call these locations Genius Loci, where students explore, learn, reflect and engage in unique ways, and develop a deeper understanding of their obligation as global citizens responsible for global issues. In this presentation, I introduce the audience to one such place, Amakhala, a private game reserve in the Eastern Cape of South Africa, and home to TCU's award-winning Rhino Initiative.

At Amakhala, students focus on a broad set of issues relating to wildlife conservation during a full immersion experience within the reserve. For two weeks, they work with local wildlife managers and veterinarians in the field, both on foot and in open game viewer vehicles, as they traverse the protected areas in the region. The course covers a range of topics related to wildlife conservation, including animal immobilization, tracking animals using telemetry equipment, animal darting and relocation, captive projects and their importance to ongoing education of local communities and international visitors. There is a strong emphasis in course content on the rhino and the poaching crisis. This is Africa's most endangered mega-herbivore and in getting to know this species and the issues that surround it, students cover many of the critical decisions facing protected area management. For example, there is an urgent need to improve rural education and health in the communities surrounding these private reserves. How can we expect to protect our natural resources when those living closest to them get no benefit from their sustainable use?

Names and affiliations: Mahesh N. Sanzgiri

Title of presentation/panel/round table discussion: Wildlife Tourism as a tool for conservation of Nature and Wildlife

Format: Oral presentation

ABSTRACT: Wildlife Tourism can be used as the right tool for conservation of Nature and Wildlife. As a Wildlife Tour operator, I successfully have created awareness about Nature and Wildlife Conservation to my clients which include mainly Corporate Group employees at all levels from workers to Top Management, up to Director level and their families, including children. I am a Management and Technical consultant to these corporate groups which is my career. I promote Wildlife Tourism to them by way of a Slide Show explaining importance of conservation of Nature and Wildlife and also unique type of tourism where one can enjoy and have a thrill in locating wildlife in the forest.

My clients also include Schools, Colleges and the General Public. I promote these activities:

- (1) Bird Watching, Wildlife Viewing tours to different locations in India and abroad.
- (2) Nature Orientation educational tours to Schools and Colleges.
- (3) Nature Trails
- (4) Marine and River Animal tours
- (5) Tours to forests where the local people initiative made to conserve Wildlife and Forests.
- (6) Study tours for Scientists who are working for Nature and Wildlife conservation.

During these tours I make my clients fully knowledgeable about Nature and Wildlife Conservation and make them committed for the same and follow them to confirm their commitment. For this purpose I make use of my own techniques and strategies.

Voices of the Wild: Getting the story out

Names and affiliations: FAN Shuxin, HAO Peiyao, LI Dong

Title of presentation/panel/round table discussion: Preliminary exploration of six BBC nature documentaries

Format: Oral presentation

ABSTRACT: Nature documentary is an artistic work of environmental protection with nature as the object of expression. Environmental protection is related to the survival and development of human beings and wild nature. In order to let people know more about the wilderness and protect wild nature, propaganda tools must be paid attention to, and must mobilize the participation of all media. The purpose of documentaries is to arouse the public consciousness, and this kind of influence is subtle. At the same time, due to their objectivity and authenticity, they can be preserved as valuable data for future generations to look up. Six classic documentaries from the BBC were analyzed, including The Blue Planet, Planet Earth, Home, Winged Migration, Oceans, and Arctic Tale. Highlights including the creative process, characteristic traits, and narrative storytelling were examined to understand the spreading and influence among the masses, in order to understand what kind of works are more likely to touch and initiate the viewer. What impresses people is not only the freshness of the theme and the awe of life displayed in the works, but also the shocking spiritual power conveyed to the audience. Therefore, how to properly integrate the content the creators want to express is the standard to measure the success of a documentary. Emotional works are easier to impress an audience. Therefore, nature documentaries should not only have the characteristics of popular science and exhibition, but also have the emotional input of the creators, including commentary, soundtrack, narrative style, etc. And these details have a far-reaching impact on the cultivation of emotions, world outlook and unconscious personal consciousness of the audience, especially teenagers.

Names and affiliations: Kat Haber (TEDxHomer & TEDxVail)

Title of presentation/panel/round table discussion: TEDx: Your Big Conservation Idea to Thousands

Format: Oral presentation

ABSTRACT: This twenty-first century Xperience for learning truly effective communication through TED Talks is a must-attend for you if you are ready to create impact with your idea. Using quotes/clips/examples from talks given by the likes of Bill Gates, Sir Ken Robinson, and Elizabeth Gilbert, Kat Haber makes clear that there is no one right formula for how to give the perfect talk. But there is a common goal: to plant the seed of your powerful idea. Kat produced 200+ TED Talks with over one million views. She'll break down the process of designing your Talk, finding your TEDx pathway and amplifying it afterwards for gathering allies and funding. Cristina Mittermeir, Dr. Susan Canney, Asher Jay, Morgan Heim and hundreds of others in conservation have given TED/TEDx Talks. More than 100,000 TEDx Talks have been spreading worthy ideas over the past decade. Are you a changemaker with an original solution for wilderness conservation or funding? How might you take what you've learned in the field and give it away briefly and freely? How do you get invited? How do you design a standout Talk? What's the best strategy for showing up at your TEDx to network successfully your bold idea? After it is produced and uploaded, what do you do to optimize your reach? Resources to be given freely: Speaker's Toolkit, TED.com Website Tour, Media Kit for TED Talks: The Official TED Guide to Public Speaking, other handouts to build a big idea into a life-changing Talk, Booklist. You'll leave this interactive session with specific guidance for giving a successful TED/TEDx Talk. TED is the place to give the talk of your life. A speaker's job is to give, not to take.

Names and affiliations: Anuksha Amla (School of Planning and Architecture, New Delhi), Shweta Roy Choudhury (Design Accord Consultants, New Delhi)

Title of presentation/panel/round table discussion: Journalism/Social Media as a Conservation Tool – Case Studies and Future Bearing

Format: Oral presentation

ABSTRACT: Traditionally, wilderness is described as a natural habitat, relatively untouched by humankind. In today's day and age of extreme urbanization and capitalism, there is hardly any area left where the most dangerous predator – The humans – haven't left their mark. This makes it more important now than ever to protect whatever little we have left of nature, and what hasn't been explored and exploited by humankind. With the Internet and Social Media ruling over everyone's professional and personal life, connectivity applications like Facebook, Instagram and Twitter are not only tools of interaction but sources of everyday news as well. Even for major events, people today prefer downloading an application in the phones rather than going through a newspaper. Thus it's safe to say that in the last decade or so, social media and such applications have taken over as a major source of information and content consumption and transcended over to become the new age Journalism tools. There is a large number of Social Media Content Creators and Key Opinion Leaders that are responsible for such an avid dependence on these applications, and these people are not only brand collaborators but also have a strong voice in influencing the millennial generation today.

Names and affiliations: Suyash Keshari

Title of presentation/panel/round table discussion: Nature and the Gen-Z Impact

Format: Oral presentation

ABSTRACT: Born between 1995 and 2012, the Generation-Z has grown up in a highly diverse and technologically advanced society. This is a group of people that nobody seems to be talking about, yet the first wave of this generation has now entered the workforce and is changing the environment rapidly. Even those who have not entered the workforce yet, are using their social and technological skills to capture a wide audience - for good causes (Greta Thunburg for example). A large majority of Gen-Z'ers however, have grown up in urban environments, far removed from nature and wildlife. As a member of Gen-Z, I will address the opportunities that our generation has to experience and preserve our natural world, its resources and everything that live in it - simply by making small yet unique lifestyle changes, or just with the tap of a screen. In this talk I will also share my stories and experiences with the natural world - especially with tigers in India - and an effort to rally the youth to conserve wild spaces, as a member of Gen Z.

<https://gcc02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.instagram.com%2Fsuyashkeshari%2F&data=02%7C01%7C%7Cb4da0464493843db381f08d7209777fb%7Ced5b36e701ee4ebc867ee03cfa0d4697%7C0%7C0%7C637013707233515044&data=ns84kLYV85TXWstaqudSZzRoCmo4YjTLdyGm2kh0ydo%3D&reserved=0>

Voices of the Wild - storytelling and conservation Panel: Reframing the Narrative

Names and affiliations: Elaine Lan Yin Hsiao (Sheffield Institute for International Development), Galeo Sainz (IUCN CEESP TEP, World Trails Network), Jason Houston (Photographer, Senior Fellow, International League of Conservation Photographers, and Fellow at Wake Forest University Center for Energy, Environment, and Sustainability), Amy Marquis (filmmaker)

Title of presentation/panel/round table discussion: Reframing the Narrative

Format: Panel of speakers

- Moderator, Elaine Lan Yin Hsiao: Elaine brings the background perspective on the overall issue of migration as it relates to the environment, including how it's typically represented vs. what the important issues really are.
- Jason Houston, photographer (Senior Fellow at International League of Conservation Photographers, and Fellow at Wake Forest University Center for Energy, Environment, and Sustainability): Jason brings the perspective of cause-driven communication for NGOs, including the fine balance between authenticity and propaganda, and what in this form of communication is effective across the spectrum of different audiences (e.g., those who are receptive vs. changing minds) within complex issues.
- Amy Marquis, filmmaker: Amy brings a perspective on the art of storytelling with a focus on individuals, struggle, and resilience, leading to universal narratives that transcend political ideologies, backgrounds, and ingrained beliefs.

ABSTRACT: The current narrative around human migration is one of nationalism, xenophobia, fear and othering. The results are that the victims—those forced into migration by politics, policy, conflict, disaster, and, increasingly, by environmental change, including climate change—are villainized. The United Nations Convention to Combat Desertification (UNCCD) predicts 135 million people displaced by drought by 2045; the World Bank estimates climate-induced internal migration could reach 143 million in Sub-Saharan Africa, Latin America and South Asia; and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) reports that 50-700 million people could be displaced by land degradation and climate change by 2050. Movements of people intersect and intermingle with migrations of other species, and both are linked to environmental change and conflict. Amidst the push and pull factors between migration, environmental change, and conflict, nature and conservation provide opportunities to prevent, mitigate, adapt, or restore.

Environmental change, migration, and conflict are not new, but the scale and speed at which these phenomena intersect, may unravel unprecedented environmental and humanitarian crisis and rippling impacts on how we live on the planet and with each other. In this context, how do we communicate the research, science, and policies needed to activate change without feeding fear-mongering narratives? How can we move people to care enough to act, and then empower them to act well? Is it possible to inspire regenerative environmental change and ecological peacebuilding to reshape the narrative towards love, peace and hope? Public pressure can force political will, creating space for informed action. This chain reaction is initiated and sustained through story as both a vehicle for information and,

more importantly, a catalyst for emotional engagement. Join us for a panel discussion on Redefining the Narrative.

Roundtable Discussion: Making visitor contacts in Wilderness and Protected Areas using WISDOM: a six-step process for effective public contacts

Names and affiliations: Ralph Swain (US Forest Service, Rocky Mountain Region, Colorado, USA)

Title of presentation/panel/round table discussion: Making Visitor Contacts in Wilderness and Protected Areas Using WISDOM: A Six-Step Process for Effective Public Contacts

Format: Round table discussion

ABSTRACT: Learning how to make professional public contacts with your Wilderness and Protected Area visitors is truly an art and a science that comes with experience. However, managers and rangers from around the globe can improve on their techniques by using a systematic six-step process called WISDOM that has been field-tested and used in congressionally designated wilderness areas in America for the past twenty years. The six steps are:

Where are you coming from?

Introduce yourself

Size up the situation

Decide on a course of action

Outline and explain the violation

Make a positive impression

WISDOM was developed to help teach inexperienced, newly employed rangers and managers at recently established protected areas how to welcome visitors, educate them to the rules and regulations governing the wilderness area and provide helpful tips to stay safe while making professional public contacts that leave a lasting impression on visitors to wild lands. WISDOM is not intended to be used as a law enforcement approach to public contacts, but it does help rangers and volunteers to be "street smart - backcountry smart" in approaching strangers and seeking their compliance with the rules. By following the six-step process, managers, rangers and volunteers can perfect their craft of making professional contacts. Most visitors to protected areas do not come with malice intent to hurt the resource. In fact, in most cases, inappropriate behavior is due to lack of information and/or education about how to lessen impacts such as making a low-impact campfire or complying with regulations to camp a specified distance from lakes, streams and trails.

Roundtable Discussion: #NatureForAll – How connecting with nature helps us care for ourselves and the Earth

Names and affiliations: Camila Perez Gabilondo (#NatureForAll Youth Champions, Coordinator), Sean Southey (International Union for Conservation of Nature Commission on Education and Communication, Chair), Karen Keenleyside (International Union for Conservation of Nature, World Commission on Protected Areas, Vice-Chair People and Parks), Pascale van der Leest (Parks Canada, #NatureForAll Project Manager)

Title of presentation/panel/round table discussion: #NatureForAll – How connecting with nature helps us care for ourselves and the Earth

Format: Round table discussion proposal

ABSTRACT: #NatureForAll is an International Union for Conservation of Nature (IUCN)-led global movement to inspire love of nature that is driven by more than 350 partner organisations worldwide. This interactive World Café style session will showcase how #NatureForAll partners are targeting new and diverse audiences and a broad range of sectors to implement concrete solutions for people and planet, such as:

- Nature for cities: For example, community planning and urban development policies to create nature-rich cities that include parks and protected areas tailored to maximize the co-benefits for people and nature.
- Nature for children: For example, education and child care programmes that enable time outdoors in nature and experiential learning about nature in early childhood and throughout life.
- Nature for health and well-being: For example, health and elder care policies that embrace contact with nature as a mechanism for delivering physical and mental health benefits for all people of all ages.
- Nature for economies: For example, private sector investment in environmentally sustainable programming, infrastructure, and innovative solutions for connecting people with nature.

This session will share the most current and compelling knowledge for connecting people with nature for conservation action as well as solutions to overcome barriers through programmes, practices and policies that support increased connectedness between people and nature. Participants will explore best practices, lessons learned, and motivation for innovative partnerships.

Roundtable Discussion: Exploration of the necessity of Wilderness in modern civilization

Names and affiliations: Swastika Deb, Shweta Roy Chowdhury, Senjuti Ghosh

Title of presentation/panel/round table discussion: Exploration of the necessity of Wilderness in modern civilisation

Format: Round table discussion proposal

ABSTRACT: This presentation intends to address the multifaceted needs of wilderness in the context of the modern civilisation as well as its subsequent impact and how it can be realised in our current state of living. It is common knowledge that “civilisation” has come at the cost of exploiting natural resources and it is only recently that the consequences of our reckless practices for centuries have finally caught up, so much so that we can no longer ignore the depletion anymore. Raising awareness for the same is amplifying every day through the outlets of social-media and online journalism and sustainable practices is a bandwagon that is only ethical to hop on. However, this is where the schools of thought seem to deviate, and the paper seeks to explore that aspect. The major narrative for marrying wilderness with our lifestyle is through declaring Climate Emergency that necessitates cleansing of the earth from the non-degradable debris and making important lifestyle changes in order to achieve minimum waste, and so forth. The authors illustrate a number of activism and movements that are mostly youth led such as the campaign by Greta Thunberg, a 16-year-old environmental activist, as well as the ones by prominent personalities in this regard and how they rely quite heavily on the virtual space for the propagation of the message. On the other hand, there are also some indigenous communities, such as the aboriginal communities from Australia who are some of the oldest human civilisations on the planet, who seem to look at this change as a natural wear and tear of the earth, something their ancestors have survived over tens of thousands of years.

The Challenges and Prospects of Protecting Nature in Urban Environments: Natural ecosystems and ecosystem services in urban areas

Names and affiliations: Siddhartha K. Rastogi (Associate Professor, Indian Institute of Management, Indore)

Title of presentation/panel/round table discussion: Role of Large Educational Campuses in Balancing Urban Ecology

Format: Oral presentation

ABSTRACT: Indian development, particularly during post-liberalization, has revolved around select urban centers. Yet, the growth of urban amenities has failed to keep pace with urban expansion. There are obvious fallouts in the form of traffic congestion, water shortage, and housing issues. However, a major under-reported casualty is the loss to local ecology. Reduced green cover has resulted in deteriorated air quality. Moreover, the local species of animals, birds, and insects have faced an existential threat due to unhindered urban expansion.

This presentation proposes a solution to such calamity through a case study-based survey of large educational campuses in India. There are 20 IIMs, 23 IITs, 31 NITs, 47 central universities, many state universities, and many other institutions of excellence, such as IISC, ISI, CSIR, AIIMS, etc. Most of these campuses have a huge land grant by the respective states, leading to a high per capita space availability. Based on an initial survey, most campuses fail in understanding local ecology. They propagate green cover that does not match the local ecology; thereby, causing harm to native species of birds, animals, and insects.

A literature review confirmed the urban challenges to local ecology. A topographic and demographic survey of major educational campuses of interest was conducted, while underlining their ecological anomalies. Then, for IIM Indore, which represents a unique geography and a sensitive ecology, through the case study method, the ecological damage sustained by this campus is illustrated, as well as potential benefits. In addition, I propose a Social Cost-Benefit analysis based multi-parameter index to measure the ecological efficiency of other campuses. A major contribution of this presentation is to underline the ecological disaster caused by unrestrained urban expansion and to propose localized solutions.

Names and affiliations: MENG Xiangyu (Beijing Forestry University), LI Dong (Beijing Forestry University), HAO Peiyao (Beijing Forestry University), FAN Shuxin (Beijing Forestry University)

Title of presentation/panel/round table discussion: A study on the stability of urban forest of Beijing based on plant diversity

Format: Oral presentation

ABSTRACT: With accelerating urbanization, the land for ecological protection has been greatly deficient and environmental quality has been decreasing. Therefore, developing an urban forest has become an important direction for urban ecological construction. For the urban forest of Beijing, its plant community configuration is convergent, structural mode is single and ecological function is poor, which significantly impacts ecological function of the urban forest. Thus, building a near-natural landscape with zonal characteristics and improving the ecological function of the urban forest have been urgent problems that need to be solved. Based on plant diversity of the urban forest, through selecting the urban forest in Beijing built-up areas, suburbs and outer suburbs as samples, this paper investigates and evaluates plant diversity. It analyzes the composition and characteristics of plant community and in-depth research on the stability of its community with applying ecological niche theory. In addition, combining with the soil property of urban forest and the management of manual maintenance, it further reveals the stability mechanism of its biodiversity. Based on the research above, this paper discovers the stability mechanism of urban forest and explores the near-natural plant configuration with higher ecological function, which have important theoretical and practical significance to enhancing the ecological function of the urban forest of Beijing.

Names and affiliations: LI Xiao-Peng (Beijing Forestry University), LI Dong (Beijing Forestry University)

Title of presentation/panel/round table discussion: Residents' Ecological and Aesthetical Perceptions Toward Spontaneous Vegetation in Urban Parks in China

Format: Oral presentation

ABSTRACT: As a result of the process of urbanization, many wildlife populations are in decline, accompanied with a disconnection between the lives of residents and local wildlife. Currently, interest is growing in spontaneous plants, as they are wild, authentic and better adapted to an urban environment. Combining a field survey in Beijing parks with a web-based survey, we investigated the perceptions of 1015 urban residents toward spontaneous vegetation in urban parks and how aesthetical features relate to the respondents' sociocultural backgrounds. The results showed that professionals better recognized the value of spontaneous vegetation compared to nonprofessionals. Lawns and traditional flowerbeds are still favored by the public, while spontaneous communities with medium blossom densities, delicate textures, white and multi-colored flowers were preferred by professionals. Furthermore, residents with more exposure to nature, having professional degrees, and higher levels of education were more likely to hold positive attitudes toward the preservation of and designing with spontaneous vegetation in urban green spaces. These results highlight the necessity for ecology education on spontaneous vegetation and urban wild heritage, as well as an understanding of the variations in plant and community aesthetic features in correlation with different residential groups to improve the perception of spontaneous vegetation, implement changes in planting design, enhance biodiversity, save costs and resources, and provide more natural space for city dwellers.

Names and affiliations: LI Feng (Tsinghua University, Beijing), YANG Rui (Tsinghua University, Beijing), MA Yuan (Tsinghua University, Beijing)

Title of presentation/panel/round table discussion: Impacts of Urban Land use on Ecosystem Services and Management Measures

Format: Oral presentation

ABSTRACT: Ecosystem services in urban areas are regarded as multiple environmental benefits fostered by urban–rural landscapes. A wide range of ecosystem services have been affected by land use and cover change in urban areas, leading to significant variation in ecosystem services, such as terrestrial carbon stocks, across a gradient of urbanization. Land use and cover change is the key factor affecting terrestrial carbon stocks and their dynamics not only in regional ecosystems but also in urbanized areas. Using the typical fast-growing city of Changzhou, China as a case study, this paper explored the relationships between terrestrial carbon stocks and land cover within an urbanized area. The main objectives were to assess variation in biomass and soil carbon stocks across terrestrial land covers with different intensities of urban development, and quantify spatial distribution and dynamic variation of terrestrial carbon stocks in response to urban land use and cover change. On the basis of accurate spatial datasets derived from a series of Landsat TM images during the years 1986 to 2011 and reliable estimates of urban biomass and soil carbon stocks using the InVEST model, our results showed that carbon stocks per unit area in terrestrial land covers decreased with increasing intensity of urban development. Urban land use and cover change and sealing of the soil surface created hotspots for losses in carbon stocks. Total carbon stocks in Changzhou decreased by about 30% during the past 25 years, representing a 1.5% average annual decrease.

The Challenges and Prospects of Protecting Nature in Urban Environments: Reaching urban populations through design and communication

Names and affiliations: Pia Ditscher ("Städte wagen Wildnis" - Allowing urban Wilderness), Dr. Thomas Hartmanshenn ("Städte wagen Wildnis" - "Allowing urban Wilderness")

Title of presentation/panel/round table discussion: How to communicate urban wilderness to the public?!

Format: Oral presentation

ABSTRACT: Wilderness is a big word. Hearing it, most people think of jungle-like landscapes, impenetrable thickets, exotic plants, colorful animals and unfamiliar sounds and noises. This might be realistic for many countries, where you can find wilderness right in front of your doorstep – even in big cities. In Central Europe, things are different: The idea of small areas of “urban wilderness”, where nature can unfold itself with less human control, is on the advance. This is exactly what the German project “Allowing urban Wilderness” (“Städte wagen Wildnis – Vielfalt erleben“) is about: The three German cities Hannover, Frankfurt am Main and Dessau-Roßlau are providing opportunities for natural succession processes to take place on various urban green or open spaces for a long-term approach (based on a five year starting period with external co-financial support by German Federal Agency for Nature Conservation (BfN) from 2016 to 2021, with approximately 4 million Euros). The city partners are closely assisted by science partners and a coordinator for public relations. It’s a multi-sectoral approach (ecology, sociology, environmental education and public relations). Not only are our goals to support biodiversity, to improve life quality in cities, to create new urban landscapes and to pioneer various options and schemes for urban wilderness projects – we also put a main focus on arousing fascination and excitement for (small scale) wilderness in urban conditions.

Names and affiliations: Ritu Dhingra

Title of presentation/panel/round table discussion: Planning for Conservation and Restoration of Natural Ecosystems under Climate and Land Use Change in India by Sustainable Urban Designing

Format: Oral presentation

ABSTRACT: Due to a burgeoning human population, land use change is a common scenario in the contemporary world. The natural ecosystems are being converted to human settlements and life forms thriving in those ecosystems get displaced and slowly and gradually either become endangered or extinct and moreover due to climate change it becomes difficult for them to adjust and blossom in new environments. This leads to a major loss of biodiversity. The natural ecosystems like forests, peatlands, grasslands, ponds and other terrestrial water bodies are exposed to many manmade threats like clearing of forested land for agriculture, mining, urban development, industrial set ups, grazing, over exploitation and introduction of alien species of plants. All this has led to a loss of many wild species of both plants and animals in India. According to the latest UN report on world populations, it is estimated that by the year 2030, two thirds, of the world's population shall be dwelling in cities. The urban population in the developing countries will double and the areas covered by the cities would be trifold. It is obvious that many more natural ecosystems like forests will be cleared to make more space for human settlements. There is no need to convert forest land to agricultural land. More vertical buildings with vertical forests in them should be constructed, with green energy sources, with vegetables and food grown on the rooftops leading to more sustainable living. In this manner the natural ecosystems can remain intact and untouched.

Names and affiliations: Mahesh N. Sanzgi

Title of presentation/panel/round table discussion: Education and Outreach Programme as a Tool in Nature and Wildlife Conservation

Format: Oral presentation

ABSTRACT: Mumbai is becoming important for nature lovers especially due to the presence of around 300 species of birds, 40 species of wild mammals, insects, butterflies, reptiles and around 1000 species of plants some of which are rare. During the last twenty years, due to urbanisation and redevelopment, infrastructure development like metro railway, mono railway, bullet train, sea transport, expressways, seashore highways, bridges over wetlands and mangroves, ropeways over Sanjay Gandhi National Park, and a tunnel for a highway passing under Sanjay Gandhi National Park, definitely there has been loss of forests, mangroves, and wetlands which are the lungs of Mumbai City. In the future we may expect disasters like tsunami, earthquakes and maybe become a second city without water like Capetown, South Africa.

Keeping this threat in mind, as a nature lover and scientist, I decided to concentrate on children and the general public to educate them on the importance of wetlands which is main source of water for the city as well as a feeding ground for birds. If we protect wetlands, it will automatically protect the mangroves around it. For this purpose I started forming groups in schools, societies to work for protection of wetlands and forests targeting Mumbai City and forming an International Wildlife Project group. To start with I have arranged lectures, field trips, camps to make them understand the importance of wetlands and forests.

Names and affiliations: CHE Shengquan (Shanghai Jiao Tong University)

Title of presentation/panel/round table discussion: The Design Approaches of Landscape Preservation of Urban Remnant Natural Area

Format: Oral presentation

ABSTRACT: "Urban remnant natural area" is a kind of natural or near-natural and historical habitat in the city. The special ecological values of urban remnant natural areas, such as the values of ecology, biodiversity, natural landscape, natural history and landscape education cannot be replaced by others. First of all, the target and idea of landscape preservation of urban remnant natural area are put forward in this presentation. Then, the function area of urban remnant natural area is divided into three types: preservation and maintenance area, renewal and restoration area and exploitation and utilization area. And the landscape types of urban remnant natural area were separated into plant, animal, water system, site, habitat and surrounding, and after that the design method of each landscape type was made. Finally, the recreation models and management system of urban remnant natural area are discussed.

Roundtable Discussion: Bring the wilderness back to the area of human activity, Study on Optimization of Urban Planting based on Ecological Function Evaluation of Wild Area

Names and affiliations: ZHU Ling, WEI Yi (Shenyang Jianzhu University)

Title of presentation/panel/round table discussion: Bring the wilderness back to the area of human activity, Study on Optimization of Urban Planting based on Ecological Function Evaluation of Wild Area.

Format: Round table discussion proposal

ABSTRACT: As we all know, China is a large country in the wilderness area. From the perspective of basic pacification, China has more than 40 % of wilderness land. This has brought us unprecedented wildlife resources and a good eco-efficient living environment.

In the current stage of the plant industry in China, the total number of plant varieties in circulation does not exceed 2000. Among them, the most affected is the landscape industry. As a result, the green space system in the densely populated areas of human activities in the process of urbanization is fragile. Low biodiversity cultivation and monolithic plant application patterns make the patch ecosystem function of the same area urban green space system much lower than the ecosystem function of green space in the original wilderness.

In this study, the biomass per unit area of planting (experimental sample per unit area of plant) and biodiversity were systematically measured through the planting forms in the green space system in urban areas of Shenyang, Liaoning Province. Horizontal comparison of the number of plant species, plant biomass per unit area, and biodiversity in the wilderness area within the same unit area (using the unit area as the experimental sample of plants. Through comparative study of the corresponding basic data, an attempt is made to review the method of planting in urban green space systems. Through the rich landscape planting design method to find a way to bring original wilderness into the urban space. Bringing the wilderness back to the gathering area of human activities can arouse people's inner feelings that belong to nature, awaken people's love of nature and more directly influence the return of nature after being away from the wilderness.

Roundtable Discussion: Role of Butterfly Gardens in conserving ecosystem

Names and affiliations: Mrs. Radhika (Chintalapati Senior School Biology Teacher, Glendale Academy International, Hyderabad)

Title of presentation/panel/round table discussion: Role of Butterfly Gardens in conserving ecosystem

Format: Round table discussion proposal

ABSTRACT:

Mata Bhumi putrahaan pruhvya

Earth is my mother and I am her son.

This Sanskrit sloka clearly explains the relationship of humans with Earth, comparing it to like a mother and child inferring that one should not harm either environment or its flora or fauna. After a detailed literature survey, I have come across a fact about Butterflies and moths. They are playing a very important role in helping stabilize our currently vulnerable ecosystem. Butterflies are an important component of the food chain as a pollinator as well as prey to many invertebrates, thereby they form a major link in the ecosystem. A natural interdependence network continues with these beautiful yet sensitive ecosystem indicator species. It is highly economical to develop butterfly gardens, as all they need is local plants. As a butterfly enthusiast I periodically conduct signature campaigns online and offline urging local governments to develop Butterfly gardens in schools, colleges, offices and hospitals.

Panel: Collaborative management of protected areas in Central Africa: building successful models of public-private protected area conservation

Names and affiliations: Richard Paton (United States Forest Service, Office of International Programs), Olivia Freeman (United States Forest Service, Office of International Programs)

Title of presentation/panel/round table discussion: Collaborative Management of Protected Areas in Central Africa: Building Successful Models of Public-Private Protected Area Conservation

Format: Panel of speakers

ABSTRACT: Efforts to manage protected areas (PA) in Central Africa, as in Africa more generally, have evolved over the last few decades to encompass a number of different administrative arrangements ranging from park management by national and/or provincial authorities to devolved management by contracted non-profit or private sector actors. Recent studies have shown a breadth of experience and lessons learned from these varied management approaches referred to as public-private partnerships or protected area management partnerships (PAMPs). Summarizing the current state of those varied approaches, Baghai et al. write, these management partnerships “...provide a direct and potentially effective means for the international community, donors, and nonprofits to contribute to conservation, economic development and governance in Africa... [and] offer potential to build local capacity, share the financial burden associated with managing vast PA estates and increase the ecological and economic benefits derived from PAs.” (Baghai et al. 2018). The U.S. Forest Service, supported by the U.S. Agency for International's Central Africa Regional Program for the Environment (USAID/CARPE), is working with protected area authorities in Central Africa – principally in the Democratic Rep. of the Congo and Rep. of the Congo – to review PAMPs that are in place to manage a number of protected areas in the region, and identifying models that are successful, where government, civil society and private partners embrace a shared vision for effective management of protected areas. The review will clarify the institution-building role of such arrangements for effective protected area management including beneficiaries/communities. The review will identify elements of a model PAMP that most effectively addresses issues such as oversight and governance responsibilities, administration and management of the PA, financial sustainability, etc.

Innovation and conservation through collaboration

Names and affiliations: K. Purnell, M. Norval, B. Dreyer, D. De Beer, (Wilderness Foundation Africa)

Title of presentation/panel/round table discussion: Wilderness Foundation Africa Northern Cape Land Project: Conserving South Africa's arid landscapes

Format: Oral presentation

ABSTRACT: South African legislation allows for privately owned and conserved land to enjoy the same status and protection as government owned Protected Areas. Through an expansion implementation programme known as the "Biodiversity Stewardship Programme" huge strides have been made in the country to secure tracts of privately owned areas of high biodiversity value as Protected Areas and Corridors. The design of the Protected Area system and the Corridors take Climate Change into account and result in planned "Climate Change Ecosystem Adaptation". A "Biodiversity Stewardship Business Case" made to South African National Treasury concluded that Biodiversity Stewardship has demonstrated the ability to secure land for conservation at a fraction of the cost of buying land and the long term cost of management is also significantly less as Biodiversity Stewardship leverages private sector investment. Based on experience in South Africa, establishing a protected area through Biodiversity Stewardship costs between 70 and 400 times less per hectare than land acquisition. The Business Case also determined that the ongoing cost of Biodiversity Stewardship to the state is at least four times lower than the ongoing cost of managing state-owned protected areas. The risk and burden of rates and legal responsibility for land management also rests with the landowners. Geographically this project is focussed in three areas. The first is aimed at closing the corridor between the Tankwa Karoo National Park and the Cedarberg Wilderness Area, which will result in an interprovincial "mega reserve" (in excess of 260 000ha). The second will continue to expand the Namaqua National Park. The third will be to consolidate the expansion of Goegap Nature Reserve. These areas have been suggested as focus areas by the protected area agencies SANParks (national parks) and the DENC (provincial reserves) who will become the long term management authorities to maintain these agreements.

Names and affiliations: Silvana Campello (Instituto Araguaia de Proteção Ambiental, Brasil), Georgios Georgiadis (Instituto Araguaia de Proteção Ambiental, Brasil)

Title of presentation/panel/round table discussion: Protecting a Public-Private Wilderness Corridor in the Cerrado-Amazon Ecotone of Brazil

Format: Oral presentation

ABSTRACT: The Cantão region of Central Brazil is the last intact wilderness along the Cerrado-Amazon ecotone, a region of exceptional biodiversity, with abundant megafauna like jaguars, giant otters, river dolphins, giant anteaters, tapirs, and arapaima fish. The region is under great threat from expanding agriculture. Government protected areas are limited to wetlands unsuitable for mechanized agriculture, and their effectiveness varies with fiscal and political conditions, often showing lapses which compromise long-term conservation goals. Instituto Araguaia has been working for 10 years to establish an effective corridor of public and private lands protecting the core of the Cantão wilderness. Today, the corridor connects the Amazonian flooded forest of Cantão Park to four private reserves in the lowland Cerrado. In Cantão Park's core wilderness, we maintain a full-time team of rangers to support and complement official park management, especially during recurring lapses in patrols. In the fertile Cerrado, which the government has no political will to protect, we are establishing private reserves to protect endangered ecosystems and shelter the park's megafauna during seasonal floods.

Lessons learned include:

- the central role of old fashioned anti-poaching patrols and fire prevention;
- the importance of not depending on support from public sources, which can come with strings attached or end suddenly;
- the importance of building solid local public support in order to weather periods of political adversity;
- the use of science, including satellite images and extensive wildlife surveys, to efficiently allocate resources and select priority areas;

Names and affiliations: Jessica Hughes (Sonoma Sustainable Tourism)

Title of presentation/panel/round table discussion: New Innovations to Extend Protected Areas & Keep Parks Open

Format: Oral presentation

ABSTRACT: This session will examine examples of successful partnerships between public and private entities aimed at keeping underfunded parks and protected areas open and secure. By exploring the strengths and shortcomings of these partnerships, we will propose ways to replicate these efforts so that other at-risk areas can remain open and new ones can be created. To keep parks open and protected areas (especially habitats) secure, some areas have created partnerships between public or government agencies and private persons or organizations. The ways in which these efforts were and weren't successful and how they can be replicated for other at-risk areas. A compelling PowerPoint presentation showcasing four examples of successful partnerships, proposed guidelines for replicating such partnerships, followed by a Q&A.

Names and affiliations: Neha Verma (Uttarakhand Forest Department), Amit Verma (Uttarakhand Forest Department)

Title of presentation/panel/round table discussion: Reaping Twin Benefits Of Ecological & Environmental Protection And Women Empowerment through Participatory Approach in Ecotourism Management: A Case from Corbett Landscape

Format: Oral presentation

ABSTRACT: Pawalgarh Conservation Reserve (PCR), an integral part of Corbett Landscape, supports a high density of tigers and elephants along with being extremely rich in biodiversity, thus attracting a large number of tourists to its Sitabani Safari Zone. Currently, more than 0.35 million tourists visit this area every year and the footfall is growing annually. With the growth of tourism emerged a serious problem of excessive littering in the open forest which posed threats to wildlife, forest and environment. Apart from this issue, the forest department also realized that although the tourism in PCR was a source of large revenue for local men, participation of local women in this industry was nearly absent. To balance the demands of expanding tourism with the protection and conservation of wildlife in a multi-stakeholder scenario, an innovative approach was adopted by the Forest Department by partnering with local women wherein local women Self Help Groups (SHGs) were motivated, trained and mentored to make hand-made, eco-friendly cloth bags for trash collection. The managers of the protected area then ensured that these bags were compulsorily bought by all the tourist vehicles entering the safari zone to take their trash back. The substantial financial gain has not only led to improvement in their economic well-being but also improved their social standing. Thus, this initiative show cases a successful example of empowering the local women economically and socially, while ensuring ecological and environmental protection through safe disposal of garbage.

Shared stewardship with local stakeholders

Names and affiliations: Veronica Santamaria (Galapagos National Park), Sandra Gamboa (Galapagos National Park), Mariuxi Farias (WWF)

Title of presentation/panel/round table discussion: Naturalist Guides doing citizen science to help the Galapagos National Park to manage Galapagos Protected Areas

Format: Oral presentation

ABSTRACT: In the Galapagos protected areas, naturalist guides, through citizen science, have become important actors that support the management of protected areas: National Park and Marine Reserve. How do they do it? Through the report of observations, a tool allows these users to report what happens in the ecotourism public visitor sites (180 sites between land and marine) that are managed by the Directorate of the Galapagos National Park. They report, for example, the presence of introduced species, conflicts of use (fishing and tourism), deteriorated tourism facilities among others. This information that the Galapagos National Park processes almost in real time allows us to make management decisions.

Names and affiliations: Sayan Banerjee (National Institute of Advanced Studies, Bengaluru)

Title of presentation/panel/round table discussion: Factors influencing Local Community Participation in Wildlife Conservation Projects in Northeast India

Format: Oral presentation

ABSTRACT: Participation by local communities in wildlife conservation projects has been increasingly advocated. Although socio-economic variables which drive community participation and its impacts have been studied, the contextual processes which produce participation have been understudied. Here, I bridge this gap by studying three wildlife conservation projects in Northeast India. My approach was ethnographic, with semi-structured interviews and participant observation. Fieldwork was conducted in 2017-2018. Five key informant interviews and thirty in-depth interviews of community members selected through snowball sampling were conducted. Participant observation during community meetings and analysis of secondary literature generated significant insights. Ten overlapping contextual factors were found to be critical for participation which emerged from everyday-interaction among conservation actors. They are: facilitation by external actors, a crisis narrative, effective entry stage activities, income opportunity, mediating voices in local community, intra-community dynamics, tangible results, capability development of locals, funding and availability of information. Local community participation in conservation projects is a socio-political process embedded within everyday-interaction among conservation actors. Investment of time and funds to understand stakeholders and their concept of participation, periodic feedback sessions, capacity development of locals for self-mobilization, innovative information dissemination are necessary for effective community participation.

Names and affiliations: Vidya Venkatesh and Bhavna Menon (Last Wilderness Foundation)

Title of presentation/panel/round table discussion: Aligning stakeholders for conservation with a participatory approach in Madhya Pradesh, India

Format: Oral presentation

ABSTRACT: Conservation refers to the protection of our wilderness spaces and the denizens living within. However, at the heart/core of the conservation sphere are people who are unique, unconventional and hold the key to conservation success i.e., the local communities living around our wilderness spaces. The need for intervention and developing of a conservation model was felt in three particular tiger reserves. In Bandhavgarh, where the human–tiger conflict was a pertinent issue, in Panna where man-made forest fires were rife and detrimental to the landscape and Kanha which was plagued by cases of poaching and illegal felling by the community members which needed addressing at the earliest possible. LWF in association with the Management of the individual Tiger Reserves engaged with the local community members to identify the conservation challenges and sought solutions by gathering resources relevant to the landscape, cultural beliefs and traditional knowledge. The then collated information was used to design customised programmes, relevant to each geographical challenge, based on the desired outcomes which was carefully executed for the specified audience who were the participants in these programmes. The success of these programmes has also been documented through movies and reports along with specific feedback from the respective Forest Department and the communities for ease of sharing and replication in other locations.

Names and affiliations: Kedar Bhide (Nature Works), Vidya Venkatesh and Bhavna Menon (Kanha Forest Department Management)

Title of presentation/panel/round table discussion: Baiga Jewellery Project: Creating a sustainable conservation mechanism through a commercial model

Format: Oral presentation

ABSTRACT: India has a traditional culture of tribal communities dependent on the forest for their livelihoods. There are many efforts being undertaken to create alternate livelihood options for such communities to reduce their forest dependence and in turn reduce conflicts with wildlife or conservation efforts on the ground. One such effort is a Baiga Jewellery project, envisaged by Last Wilderness Foundation and supported by Kanha Forest Department, branded under Nature Works.

Baigas are one of the primitive tribes of Central India and reside in and around the forest. They are dependent on the forests for NTFP and often encounter wild animals. As with most of the tribal lifestyles, they are content with their life and are not motivated to learn new skill sets or change their existing way of living. Exploring their traditional skill sets and selecting one which can be monetised was thus imperative. To this effect, LWF zeroed in on their traditional skill sets of jewellery making for personal use and decided to work on those skills.

Efforts like these need economic scale up and financial investment for long-term sustainability for increasing community participation involving processes like raw material and finished product inventory, upfront payment of labor charges, creating different retail and online markets and promotion of the product, taxation and commercial regulations etc. It's challenging for an NGO or Forest Department to work on commercial aspects and scaling up projects for long term sustainability.

Panel: Scaling up conservation action: leveraging the power of collaboration in northeast India

Names and affiliations: Rita Banerji (Green Hub Project) | Rita Banerji (Green Hub Project) | Nandini Velho (Pakke Tiger Reserve & Eaglenest Sanctuary, SenoTsuah) | Mordecai Panmei (Corbet Foundation & Green Hub)

Title of presentation/panel/round table discussion: Scaling up Conservation Action: Leveraging the power of collaboration in northeast India

Format: Panel of speakers

ABSTRACT: Green Hub Project was initiated in 2015 to leverage the power of youth and community members belonging especially to indigenous communities and remote areas in conservation action. The core idea was to empower and engage them through the use of the visual medium. Green Hub is in its 5th year now with a network of 88 fellows across the region and collaborations with several organisations. The core value has been transcending barriers of language, identity and borders to come together for conservation and building the region back as a collective.

Nandini Velho has been working in Pakke Tiger Reserve and Eaglenest Sanctuary over the last 12 years, bridging the gap between research and conservation action on the ground.

Seno Tsuhah, is one of the leading voices from indigenous communities in India, bringing focus to the value of agro-biodiversity and traditional agriculture in the face of climate realities.

Mordecai Panmei belongs to the Rongmei tribe and comes from Tamenglong, Manipur. A Green Hub fellow from 2016-17, Mordecai while being part of Corbet Foundation set up 'Tamnglong for Conservation. He has been focusing on wildlife conservation and working with the community to think of preserving their forests and rivers.

Panel: Voluntary relocation from Protected Areas: making room for wildlife and a new life for people

Names and affiliations: Prerna Singh Bindra

Title of presentation/panel/round table discussion: Voluntary Relocation from PAs: Making room for wildlife & a new life for people

Format: Panel of speakers

ABSTRACT: Voluntary relocation from Protected Areas, especially from core critical tiger habitats is an important part of Government of India policy for conserving species like tigers which require vast, inviolate habitats. However, efforts to resettle people from PAs have been criticized as they sometimes fail to address people's expectations to rebuild lives, and have historically been poorly executed, and documented. Yet, there is research (from Bhadra, Nagarhole, Rajaji, Satpura tiger reserves) that suggests that relocation from PAs in India is increasingly people driven, with communities wanting to move out due to high human-wildlife conflict, and for better opportunities, education, healthcare, etc.

Conservation-related resettlements are especially challenging in India with an estimated 4.3 million people living within PAs, sharing spaces with tigers, elephants, bears, leopards and other megafauna. In the past 30 years, ~2% of these have moved out. Such resettlements continue to be hotly contentious, with ideological positions deeply entrenched on both sides of the debate. At Wayanad Wildlife Sanctuary, Kerala, India resettlement of communities has been ongoing since 2012, and has been initiated, at least partially, by the people themselves. Wayanad sanctuary has one of the densest populations of tigers and Asiatic elephants globally, and has amongst the highest human population within a PA in India—thus also sees intense human-wildlife conflict with immense crop damage, loss of human life and retaliatory killing of wildlife. I interviewed relocated people, and those proposed to be relocated, and analyse the drivers of voluntary relocation, and challenges and benefits to relocated communities, and wildlife. Anecdotal and recorded evidence shows successful rewildlings in areas from where relocations have occurred. We will highlight these findings and discuss how fair, informed, sensitively-executed voluntary relocations present an opportunity to simultaneously attain goals of wildlife conservation and economic development of forest-dwelling communities.

Training: Agenda-setting for Wilderness

Authors and affiliations: Amy Lewis, The WILD Foundation

Title: Agenda Setting for Wilderness

Workshop

ABSTRACT: For decades, the conservation sector has privileged specialist knowledge that informs policymakers on how best to craft and implement ecologically-sound policies. This is evident in the vast number of scientists and human dimensions specialists working in the conservation sector who specialize in transforming relationships that directly impact spatial ecology. Underrepresented in conservation are the social scientists, community organizers, and communicators who are best equipped to shift the public and institutional opinions and priorities that determine the outcome of conservation policy decisions and that assist in successful policy implementation. While many conservationists still prefer to work in localized settings on small-scale solutions that avoid complications wrought by involving public or governing institutions, a growing number of conservationists recognize the need for large-scale land management solutions that often require, at the very least, government consent. Acquiring consent unavoidably triggers politics, an intimidating prospect for many conservationists working in lean, low capacity and often remote settings.

This session will help reduce confusion about how to initiate and carry out cost-effective political strategies, while also encouraging regional and international coordination to multiply sector-wide effectiveness. Political scientists know that the policy process is divided into four phases: problem definition, agenda setting, decision-making, and implementation. In the past, most conservation policy specialists attended to last two phases of this process to the near exclusion of the first two. Ultimately, this harmed conservation's ability to compete with other issue areas and setback strengthening the political will necessary for lasting conservation gains.

Panel: People Protecting Landscapes and Seascapes: Diverse approaches & Lessons from South Asia

Names and affiliations: Vishaish Uppal (WWF India), Pijush Kumar Dutta (WWF India), Smriti Dahal (Kanchenjunga Conservation Area), Nuklu Phom (Yongyimchen Community-based Conservation)

Title of presentation/panel/round table discussion: People Protecting Landscapes and Seascapes: Diverse approaches & Lessons from South Asia

Format: Panel of speakers

If you propose a panel of speakers, please identify speakers and topics of presentation: Vishaish Uppal, Pijush Kumar Dutta, Smriti Dahal, Nuklu Phom

ABSTRACT: The PPLS Initiative is rooted in the recognition that “Nature” is not an undifferentiated and pristine expanse, but a mosaic of diverse ecosystems with interrelated areas and land uses shaped by human communities over millennia, used and managed by diverse communities who are often custodians of these ecologically rich areas. An estimated 65% of the world is under some form of community governance and/or management (RRI, 2015), while others estimate that this coincides with areas that hold 80 percent of the planet’s biodiversity (Sobrevilla, 2008). There is an unprecedented opportunity to bolster conservation by Indigenous peoples and local communities and scale it up further to ensure recognition of a more holistic, inclusive and effective approach to conservation and to combating the economic, environmental, social and political drivers of increasing species decline and ecosystem degradation. We would like to showcase some cases on community led conservation where territories and areas are being customarily governed, managed and conserved by indigenous peoples and local communities including effective and equitable livelihoods and conservation outcomes.

Collaboration to accomplish conservation goals: shared responsibility and benefits

Names and affiliations: Abhishek Jamalabad (Marine Conservation Programme, WWF India)

Title of presentation/panel/round table discussion: Citizen Science-based Mapping of Goa's Intertidal Zones

Format: Oral presentation

ABSTRACT: The intertidal zone of seashores or the area between the high and low water marks abounds in biodiversity, renders critical ecosystem services, and supports numerous livelihoods. This habitat facilitates physical processes that maintain the integrity of coasts and shallow seas, thus acting as a physical barrier against coastal erosion, and facilitating nutrient cycling and beach formation. Yet little is known about the intertidal zone in India, and it remains largely ignored in the face of development, as no comprehensive data baselines exist for this habitat, and it receives very little attention in the broader conservation dialogue. Our project addresses this issue in the state of Goa, by leveraging citizen science to raise awareness about this habitat and document it systematically. We run a program wherein members of the public are introduced to intertidal biodiversity at accessible, public locations in Goa, via free guided walks. During these walks, we also encourage simple biological data collection to build an open-access biodiversity catalogue, on the database platform 'iNaturalist'. This catalogue contains over 780 observations of 200 intertidal species, collected over 10 months – most are first records for the region, and at least eight are hitherto undescribed species (as confirmed by the reviewer community). In the coming months, we aim to create an interactive web-based map to visualize this growing body of open-access data, in a manner that empowers citizens to enhance their own exploration and documentation of these areas. Additionally, we plan to conduct a variety of workshops designed to raise awareness among diverse audiences, draw attention to the value of this habitat, and introduce people to the practice of intertidal exploration and documentation.

Names and affiliations: Nirmal Kulkarni (Mhadei Research Centre)

Title of presentation/panel/round table discussion: The Wilderdest Story.

Format: Oral presentation

ABSTRACT: The Mahdei Bio region is steeped in rich cultural history. The discovery of ancient rock art carvings at Viridi village prove the existence of an ancient civilization on the banks of the Valvanti, a river which is the tributary of the Mhadei, Goa's lifeline. The presence of Hindu icons including that of the Saptamaturkas, Ganesh and Vetala in Chorla and Sada villages of Karnataka go on to prove the strong presence of ancient culture in the region.

Ecologically, the region is significantly very important, as it is the catchment area for the tributaries of the Mahdei River, i.e. the Haltar nallah and the Valvanti River amongst others. The mixed moist deciduous and semi evergreen forests nurture and support a criss-cross network of rivulets and streams that support vast diversity of life forms, many of which are endemic and threatened in the Western Ghats.

A 'wildlife corridor' that allows free movement of large mammals like tigers, leopards and wild dogs, the Mahdei region is wedged between the tri-state boundaries of Goa, Karnataka and Maharashtra. The region is ecologically important and rich in minerals — a dangerous trait for any forest.

A trip to the region twenty years ago prompted Captain Nitin Dhond, a merchant navy Captain and our Managing Director today, to rescue it from the pressures of timber and mining lobbies and cash crop monoculture planters. His vision brought together a team of nature lovers and wildlife professionals, a herpetologist and ecologist to create a dream project that initiated environmentally-conscious tourism in Goa.

Names and affiliations: Gerard Martin (The Gerry Martin Project)

Title of presentation/panel/round table discussion: A Million Deaths: mitigating death and disability from snakebite in India

Format: Oral Presentation

ABSTRACT: Every week, almost a thousand people die in India due to venomous snakebite. Many more lose limbs, tissue or suffer some permanent loss of life function. With between forty and fifty thousand deaths due to snakebite, India accounts for nearly half the global number. The Gerry Martin Project works at the frontline of this conflict between humans and snakes, in the hardest-to-reach and most vulnerable communities in India. One species of snake is responsible for a majority of snakebite deaths, the Russell's viper. Russell's viper bites are alarmingly common and the death and physical damage endured by rural communities makes other medical crises pale in comparison. A lack of national data makes it hard to quantify exactly how many deaths can be attributed to the species. But, there is a general consensus that Russell's vipers account for more death and disability than any other snake in the country. Unfortunately, there is absolutely no information about this snake's movements, behaviour, seasons and populations in India. There are no studies conducted to understand what factors affect snake populations, why there is so much conflict, whether any practices or protocols can help mitigate this conflict and what it would take to simply reduce people and snakes coming across one another. Through this presentation, we will explore a pioneering project that aims to fill this knowledge gap and understand the exact dynamics of conflict between humans and snakes. We do this by capturing snakes in conflict situations, bringing them in and with the permission of the Forest Department, surgically implanting radio transmitters into these snakes before we release them back to exact same location that we found them at. We track them every day, noting their movements, behavior, breeding cycles, etc.

Names and affiliations: CAI Wenming (Wuhan University)

Title of presentation/panel/round table discussion: Agricultural Zen---A Study of "Symbiosis" in the Environment of Zen temples

Format: Oral presentation

ABSTRACT: Temple Gardens as one of the main categories of Chinese classical gardens, is the spiritual core of Chinese Zen Buddhism. Zen temple gardens also meet Chinese Buddhist spiritual core features. Chinese Buddhist monks in the Jin Dynasty began agricultural production activities, along with the rise of Zen. Founder Dade created "agricultural Zen both" in Zen pastoral farming mood: on the one hand seeking quiet natural forest environment in the natural environment, appropriate reclamation, ecological cultivation of rice, fruits and vegetables. On the other hand pay attention to Zen "by the Zen into the heart" the practice of philosophy, meditation and farming combined, to "clear your mind", "repair the heart", "peace of mind" the Buddhist realm.

Roundtable Discussion: Collaboration to accomplish conservation goals: Conservation as a Social Science

Names and affiliations: Jeph Mathias, Independent development professional, specialises in complexity and the "human/environment interface"

Title of presentation/panel/round table discussion: Conservation as a Social Science

Format: Oral presentation

ABSTRACT: Although high quality biological science is critical, I argue that it is but a tiny part of developing solutions to any conservation issue. Every conservation issue is nested in a social space and it is the non-rational dynamics of that space in which most conservation battles are fought. We have to understand and work with complexity, behavior-based approaches and "socio-religio-culturo-politico-ethno-traditional-power-based human decision making and self-organization (Phew!). There's the rub!

In this interactive session I use power point, small groups games and discussion to look at the complexities of real life conservation.

<https://gcc02.safelinks.protection.outlook.com/?url=www.unpredictable.co&data=02%7C01%7C%7C88e0daf666df4e0bd6a808d74c72cd70%7Ced5b36e701ee4ebc867ee03cfa0d4697%7C0%7C0%7C637061928274479434&sdata=%2FOyzxqFL%2B%2FahnbDQW7PV4Wx3WekYi%2BcMgpGUtTfMqno%3D&reserved=0>

Protecting and Restoring Wild & Scenic Rivers: Understanding and protecting relationships with rivers

Names and affiliations: Chris Armatas (Oak Ridge Institute for Science and Education), Alan Watson (Aldo Leopold Wilderness Research Institute), Bill Borrie (Deakin University), Chris Prew (USDA Forest Service), Colter Pence (USDA Forest Service), Jimmy Gaudry (USDA Forest Service), Tad Wehunt (USDA Forest Service)

Title of presentation/panel/round table discussion: Exploring the diverse range of human-nature relationships with the Flathead Wild and Scenic River

Format: Oral presentation

ABSTRACT: The U.S. Wild and Scenic Rivers Act protects free-flowing river segments within the United States that have outstandingly remarkable values (ORVs), which include recreation, scenery, geology, culture, history, fisheries, and water quality. Protected river segments are further classified as Wild, Scenic, or Recreational, mostly defined by the level of access and human development. The Flathead River system in Montana, USA is comprised of 219 river miles protected under the Act. This system borders Glacier National Park, flows through parts of the Bob Marshall Wilderness Complex, and winds past more developed areas. The managers and planners administering this particular river system have the challenging task of protecting a broad range of ORVs across all three river classifications (i.e., Wild, Scenic, and Recreational). These managers and planners, in consideration of input from the general public, are revising the Comprehensive River Management Plan (CRMP).

This research includes a social science study on understanding social vulnerability of human-nature relationships. Specifically (using Q-methodology and Q-sorts, qualitative interviews, and a mapping exercise), this study explores the perspectives of a broad range of people regarding the importance of human-ecological meanings and services (HEMS), and a diversity of factors of influence relevant to such HEMS. Data analysis yields a limited number of general archetypical relationships, which are represented by factor arrays (a normal distribution figure populated with HEMS) and interview discussions. Results include differing human-nature relationships and perceived factors of influence across the Wild, Scenic, and Recreational segments.

Names and affiliations: LIU Hailong (Tsinghua University), ZHOU Yuxia (Tsinghua University), ZHU Jianda (Tsinghua University), YU Jie (Tsinghua University), ZHUANG Yaqiao (Tsinghua University)

Title of presentation/panel/round table discussion: Value, Threat and Prospect: Research on Conservation of Wild Hydro-scape in Three-Source-River Area, China

Format: Oral presentation

ABSTRACT: Within the Three-Source-River Area, China, there are protected areas of different designation categories and levels of protection, such as World Natural Heritage site, National Park and National Natural Reserve, etc. With huge amounts of undisturbed land or land with only slight human activities, and with relatively intact eco-systems, rich bio-diversity and pristine characteristics as well, this region undoubtedly has many wilderness characteristics. However, this region has had a long coexistence relationship between pastures and grasslands, people and animals, mountains and water, and a deep respect for water sources, holy mountains and sacred lakes, thus it has fostered the unique ecological wisdom and perfect harmony between wilderness and culture. This presentation, based on a general definition of wilderness, focuses on the wild hydro-scape, present as glaciers, wetlands, river sources, streams and river reaches, springs, and lakes, etc, and identifies outstanding values of them, including bio-diversity, hydrology, geology, sustainable husbandry, natural belief, local culture, scenic appreciation, recreation and aesthetics. Through the analysis of typical landscape units and sites of this region, this paper tries to identify the distinctness and represent them in regional, national and even world levels. Finally some threats from roads, energy development, tourism, building and settlement are evaluated and some suggestions for future sustainable development are proposed.

Names and affiliations: Dr. Mark Morgan (University of Missouri), Dr. Christine Jie Li (University of Missouri), Jennifer McCarty (University of Missouri)

Title of presentation/panel/round table discussion: Proximate and Distal Visitors at the Eleven Point National Scenic River, Missouri

Format: Oral presentation

ABSTRACT: Understanding visitor satisfaction is an important, but challenging aspect of planning and management of wild and scenic rivers. Providing a diversity of recreation opportunities may not be sufficient to meet the needs of contemporary visitors. Leisure experiences are dynamic and should be monitored regularly to determine if legislative intent and management objectives are being met. Visitors frequently return to particular sites and may influence others through word-of-mouth communication or by using social media. Visitor recruitment and/or retention is a primary concern for many river managers. Which attributes or characteristics of the recreation experience are most influential to visitors? Is place attachment related to outstandingly remarkable values? These and other questions were asked of a sample of visitors along the Eleven Point National Scenic River (EPNSR) in southern Missouri, one of the 8 initial units of The National Wild and Scenic River system. Legislation encourages management actions that cross political boundaries and promotes public participation. About half of the acreage within the EPNSR are private lands. Private land along the river is managed by easements to assure protection of its scenic values and natural resources. A portion of the river lies adjacent to a 16,500-acre tract known as the Irish Wilderness. This 10-month visitor study was conducted in 2019. Over time, resource managers expected to see minimal differences between local and distant visitors, as well as similarities in their desired recreation experiences. Analysis has not found this trend at EPNSR.

Names and affiliations: John Daigle (University of Maine)

Title: Campsite conditions and visitor use and user characteristics within the Allagash Wilderness Waterway: A longitudinal analysis over twenty years from 1999 to 2019.

ABSTRACT: A campsite analysis project was completed to measure campsite conditions such as extent of campsite impacts and loss of vegetative screening among campsites in the Allagash Wilderness Waterway (AWW) from 1999-2000. In 2003, a mail-back visitor survey was completed to measure visitor use, user characteristics, and satisfaction. In 2014, a campsite analysis was repeated to track changes with improvements and deteriorations in campsite conditions. In 2019, another visitor survey was completed to reassess visitor use, user characteristics, and satisfaction via an online visitor survey. We will synthesize some of the key findings informing planning and management of the AWW and discuss the value of long-term monitoring of campsite conditions and visitor use, user characteristics, and satisfaction. We will also discuss some of the challenges and opportunities to methods and procedures with collection of resource and visitor data over long periods of time.

Protecting and restoring wild and scenic rivers: Species Conservation

Names and affiliations: Dr. Satyaranjan Behera (Odisha Biodiversity Board Regional Plant Resource Centre Campus, Nayapali, Bhubaneswar), Dr. Nimei Charan Palei

Title of presentation/panel/round table discussion: Protection, conservation and procreation of river turtles

Format: Round table discussion proposal

ABSTRACT: I shree Rajendra Prasad Panigrahy secretary, Animal Welfare Association for Rehabilitation and Development (AWARD) am to intimate that our team have already located a turtle breeding in Brahmani River Bed since 2014. From this year we are doing research work over river turtle under the guidance of Senior Scientist Prof. Satyaranjan Behera. This research program can also be implicated in other river in India also, so that the breeding center can be easily located & their protection, conservation can be done. Beside this the river turtle can be protected from extinction.

Names and affiliations: Steve Lockett

Title of presentation/panel/round table discussion: Mitigating threats to an iconic fish inside a Protected Area

Format: Oral presentation

ABSTRACT: Mahseer, also known as the 'tiger of the river', are ideal umbrella species in Indian rivers, being large (potentially 30kg+ mega fauna) apex predators, and intolerant of low oxygen and poor water quality. Yet even today, after decades of study, understanding of ecological needs and even their correct identification is subject to much confusion. Most of the remaining populations exist inside Protected Areas, yet even there, they are subject to multiple threats. As with all water-based species, dam building, sand extraction, destructive fishing techniques and release of invasive species can impact on life chances both inside and outside a PA. Water-borne pollution could even wipe out life inside a PA, if there are communities or human traffic upstream, outside of the PA. To build a coherent conservation programme, we first need a complete identification at species level. Having recently completed this for the hump-backed mahseer (*Tor remadevii*) of the River Cauvery basin, we are now building an ongoing study into habitat needs. The population of hump-backed mahseer inside Sathyamangalam Tiger Reserve, on the River Moyar of Tamil Nadu may be the only breeding population left, and a single pollution incident from outside the PA could wipe them out. Multiple processes are needed to ensure we do not lose this iconic, Critically Endangered fish species. We need to engage with local communities to ensure they understand the risk, and we have to find ways to extend the PA or the distribution of the fish, all while continuing studies into the ecology of the wild stock. For the other mahseer in India, these processes can only happen if we can correctly identify at the species level. For all PAs containing freshwater, there need to be mechanisms to ensure habitat conservation is not imperiled by upstream pollutions.

Names and affiliations: Ebtisamul Zannat Mim (Nature Conservation Society, Bangladesh), Md Golam Rabbi (Bangladesh Forest Department)

Title of presentation/panel/round table discussion: Conservation breeding of the critically endangered Northern River Terrapin (*Batagur baska*) in Bangladesh

Format: Oral presentation

ABSTRACT: Northern River Terrapin (*Batagur baska*) is listed as Critically Endangered in the IUCN Red List. A recent survey on the *B. baska* in Bangladesh shows no viable population in the wild and only 2- young were found in the Sundarban in 2013. This study on the in-situ conservation breeding of *B. baska* was carried out from March 2017-April 2018 at Bhawal National Park (24°5'45"N, 90°24'14"E). Four females and three males were observed during this study, among which three females laid eggs. Individuals kept in a facility started breeding from early September 2017 and ended in early April, 2018. Red coloration on the male's neck was noted during the breeding period. Feeding decreases from 25%-75% during breeding time. No significant courtship behavior and parental care were observed. Female came to the sandy area to build a circular nest with 42-50 cm in diameter and laid eggs at night in 2-3 layers. Eggs deposited 25-31cm depth on the ground. Clutch size varied from 18-28 and the average incubation period was 68 days. Hatchlings came out from the nest independently with 90.74% average success rate. Supplied foods were exclusively green vegetables, water spinach, pumpkin, fresh shrimps and dry shrimps. Juveniles are planned to be released into the wild.

Names and affiliations: Samir Kumar Sinha, Subrat Kumar Behera, Adrish Poddar, Rahul Kumar, B. C. Choudhury, Rahul Kaul

Title of presentation/panel/round table discussion: Status and conservation of top predators in the Gandak River, India

Format: Oral presentation

ABSTRACT: ‘Endangered’ Ganges River dolphin (*Platanista gangetica*) and ‘Critically Endangered’ Indian Gharial (*Gavialis gangeticus*) are two top predators in the Gandak River, a Himalayan tributary of the Ganges. The river, known as Narayani in Nepal, traverses for about 320 km in the state of Bihar in India before meeting the Ganges River. The river flow is regulated by a barrage constructed across it at the India-Nepal border. The braided channels of the river keep on shifting and eroding the banks and there are very few human settlements along the banks.

Wildlife Trust of India, with support from the Bihar Forest Department, conducted boat surveys in about 320 km river stretch during 2018-19 to assess population and threats the two species faced in the river. Presence of 155 (best count) dolphins and over 200 gharials illustrates the conservation values of the river. Signs of smooth-coated otters (*Lutrogale perspicillata*) were also recorded in the surveys. Direct threats to the species include detrimental fishing methods such as electrofishing and operation of mono-filament nylon gillnet and zero mesh size mosquito nets etc. Moreover, the regulated river flow causes frequent and abrupt changes in habitats of these species. Fluctuations in water regime due to release of water from the barrage causes erosion of sand banks used by gharials for nesting. A proposal for developing the river as waterways and plying vessels is a serious emergent threat to river biodiversity. The presentation will present a detailed account of the findings of the surveys and put forward suggestions for conservation of the two key species of the river.

Species conservation - the Ganges River Dolphin and the Indian Ocean Humpback Dolphin

Names and affiliations: Sarah Levine (Himalayan Outdoor Center)

Title of presentation/panel/round table discussion: Ganges River Dolphin & Passports; Nature Knows No Borders Major

Format: Panel of speakers

ABSTRACT: The intersection between conservation science and the political economy to develop practical and pragmatic solutions to trans-boundary conservation challenges facing the Ganges river dolphin (*Platanista gangetica*) and the Karnali Watershed takes nuanced understanding and intentional international diplomacy to work to ensure survival of this lesser-known species. The freshwater cetacean's status globally is less than 2000 between India, Nepal, and Bangladesh. In the 2016 national census of river dolphin, the Department of National Parks and Wildlife Conservation partnered with IUCN and NTNC and counted (at best) 52 in Nepal of which 43 are found within the Karnali-Mohana river system during the monsoon. Adding to the complexity of management for this river dolphin species are the fact that 1) the region it is found includes human populations living in subsistence conditions and 2) the species ranges across three countries and therefore requires international cooperation and coordination. India has declared the Ganges River dolphin as their national aquatic animal, hosting one of the largest populations in the Vikramshila Wildlife Sanctuary. Other charismatic megafauna such as the Bengal tiger, greater one-horned rhino, and Asiatic elephant have received cross-border attention while river species such as the Ganges river Dolphin have not. A cross border census of the freshwater species has yet to be performed. Dolphins are lacking strong enough lobby activities due to the political climate despite its role as a bioindicator and flagship species. According to local surveys of fishers in Kailali and Bardia districts of Nepal, the overall fish biomass has decreased around 40% within two decades. It was once a playground for poison fishing until policy and enforcement eliminated the practice and the Karnali-Mohana river system's resilience was challenged again by the high demand for a handful of resources. The establishment of a trans-boundary dolphin sanctuary with co-management from both nations will play a vital role for the in-situ conservation of the species within the Karnali-Mohana Watershed with the hopes that the preservation of the species will play a vital role in the economic prosperity in the region.

Names and affiliations: Sunny Deori (Wildlife Institute of India), Abdul Wakid (Wildlife Institute of India), Vishnupriya Kolipakam (Wildlife Institute of India), Qamar Qureshi (Wildlife Institute of India)

Title of presentation/panel/round table discussion: Importance of tributaries in the distribution of Ganges dolphin (*Platanista gangetica gangetica*): A case study of Kulsī River, Assam

Format: Oral presentation

ABSTRACT: Tributaries not only serve as a habitat but also as a refuge for Ganges dolphin during flood situations which also suggests the significant migration behaviour of dolphins. To understand this phenomena a seasonal survey was conducted to estimate the abundance of a viable residential population in an approximately 75km stretch of the Kulsī River. It is a small tributary of Brahmaputra River originating from the hills of Meghalaya and entering Assam at Ukiam ($25^{\circ} 38' N$ and $91^{\circ} 38' E$) and confluences with Brahmaputra at Nagarbera ($26^{\circ} 7' N$, $91^{\circ} 0'E$). Independent observers in tandem boats were used in a Huggins estimator to estimate dolphin abundance. The habitat characteristics and anthropogenic stressors were also recorded during the surveys. A stable population was recorded throughout all the seasons with highest peaks in monsoons and winters. The population was found positively skewed towards meanders and confluences. Like other tributaries Kulsī is also under high anthropogenic pressure. Dolphin distribution was significantly affected by the presence of high fishing activities and sand mining activities. Mosquito nets (a banned fishing gear) were recorded throughout all the seasonal surveys. Harmful mechanised ways of sand mining activities is a recent development in Kulsī. These are directly affecting the prey resource of dolphin and subsequently the survival of dolphin populations. The effect of anthropogenic stressors can be felt more on tributaries due to its smaller width and depth compared to the main channels. Kulsī and Subansiri are the last remaining tributaries with a residential population of Ganges dolphin.

Names and affiliations: Anumitra Phukon (Wildlife Institute of India, Dehradun), Dr. J.A.Johnson (Wildlife Institute of India, Dehradun), Dr. Abdul Wakid (Wildlife Institute of India, Dehradun), Prof. Qamar Qureshi (Wildlife Institute of India, Dehradun)

Title of presentation/panel/round table discussion: Current status of endangered river dolphin *Platanista gangetica gangetica* in Subansiri, the largest tributary of upper Brahmaputra basin.

Format: Oral presentation

ABSTRACT: Being the largest tributary of Brahmaputra, Subansiri is a very rich fresh water ecosystem and harbours a good number of Ganges dolphins (*Platanista gangetica gangetica*). Due to various human induced threats, specifically gill net entanglement, overfishing by using mosquito net, habitat destruction, pollution etc., Ganges dolphin population is declining rapidly and the critical status of this endangered species stresses the need to determine population abundance throughout the distribution range. This study was focused on estimating the current dolphin status in Subansiri and investigating the influence of habitat characteristics and anthropogenic factors on dolphin occurrence. For population estimation, boat-based surveys were conducted following concurrent count with two independent observer teams placed on two platforms of the same boat. Information on habitat characteristics (channel type, depth, river width, riparian type) and anthropogenic activities (fishing activities e.g. gill net, mosquito net, hook, lift net etc. and boat traffic) were also recorded every km to see their influence on dolphin sightings. Average encounter rate of dolphins was estimated using both primary and secondary observer team's data. We used capture – recapture, Huggins conditional likelihood model with radial distance and habitat type as covariates to derive precise population estimate. We estimated 48 (SE=6) dolphins in Subansiri with encounter rate 0.28 (SE=0.08). There was a significant difference in channel types preferred by dolphins ($\chi^2 = 33.2$, $df=5$, p).

Names and affiliations: Puja Mitra (Social Enterprise: Terra Conscious)

Title: Enabling Community Networks For Responsible Marine Nature Tourism & Conservation

ABSTRACT: India's 7000 sq. km coast line is rich in coastal & marine biodiversity including Schedule I species such as cetaceans, sea turtles, coral reefs and whale sharks. Our waters have traditionally supported diverse fishing communities across the country. However, there is increasing pressure to develop the coasts and diversify the use of marine/coastal habitats to generate more revenue, through proposed infrastructure projects such as ports/marinas and golf resorts. A 2015 study on dolphin - based tourism in Goa has highlighted the stress caused to the endangered Indian Ocean Humpback dolphin (*Sousa Plumbea*), due to unregulated & unsustainable marine tourism. This is mainly due to a lack of regulation, sensitive policies, greenskilling and market access. These threats are augmented by global climate change, increasing pollution, mega coastal development projects and lack of any sustained outreach that sensitises visitors and operators to marine biodiversity & ecosystems. Terra Conscious is an innovative attempt to use a social business model to connect trained ethical tour operators with sensitised markets to build a more sustainable livelihood while reducing the stress caused to the focal species and their habitat, thus enabling a community-centred approach to conservation. Furthermore, the establishment of India's first public-private marine wildlife stranding response and monitoring network (Ocean Watch – Goa) initiated and coordinated by Terra Conscious, has 600 trained lifeguards employed by a private firm deployed across Goa's 100 kms coast who provide information on marine stranding incidents, to the Goa Forest Department. This network has led to a record 266 stranding cases across Goa's coast, since it was established in 2017. Local community networks are critical to enabling inclusive and sustained conservation action on the ground, hence sharing the overall learning and experiences from these initiatives can help to inform similar approaches across the coast of India.

Protecting and restoring wild and scenic rivers: River Protection Governance

Names and affiliations: CHANG Yi-Chang (Tsinghua University), ZHOU Yuxia (Tsinghua University), LIU Hailong (Tsinghua University)

Title of presentation/panel/round table discussion: The Wild Rivers Mapping: Finding the wild rivers in China

Format: Oral presentation

ABSTRACT: Wild rivers are important parts of wilderness all around the world. Not only providing a variety of ecosystem services, including water conservation, purification, creation of high-quality habitats, and bio-diversity in the river as well as in the riparian areas, they also have potential aesthetic and recreational values. However, China is at a stage of rapid urbanization and massive infrastructural development, and the rivers are confronting huge development threats. In view of that, wild rivers in China have not yet been systematically conserved. This paper will summarize methods of identification and classification of wild rivers in the world and try to apply them to China. In regard to the current situation of river management in China, methods of identifications and assessments of wild rivers will be suggested based on GIS approaches. The Wild Rivers Mapping in China will be acquired through integrating hydrological datasets, human footprint datasets of human impacts and influence of water conservancy projects including hydrological reservoirs and other infrastructure. Finally, the degrees and levels of human disturbance to wild rivers will be identified. By classifying the levels of disturbance, the undisturbed rivers will be spatially recognized and the conservation and management of wild rivers in several major river basins in China will also be explored.

Names and affiliations: LI Peng (Yunnan University, Kunming, P.R. China), YANG Peng (Yunnan University, Kunming, P.R. China), LAN Hongmei (Yunnan University, Kunming, P.R. China), Zhou Shuqin (Yunnan University, Kunming, P.R. China), Zhao Min (Yunnan University, Kunming, P.R. China), Yang Qingxing (Yunnan University, Kunming, P.R. China)

Title of presentation/panel/round table discussion: The Spatial Distribution Differences and Influencing Factors of Protected River System between China and the United States

Format: Oral presentation

ABSTRACT: The protection of natural areas is a result of political and ecological coupling, and natural and socio-economic conditions of the region may have an impact on the spatial distribution of protected areas. The National Water Park System of China (NWPS) and National Wild and Scenic Rivers System (NWSRS) of the United States of America are two types of Protected River System (PRS) that protect rivers and water resources. The PRS of the two countries have their own unique characteristics in spatial distribution. This presentation uses GIS techniques to analyze the spatial distribution of PRS in the two countries, and show the agglomeration status of units through hotspot analysis, and superimposes the base maps of natural geography, ecological division and DMSP/OLS nighttime light data, but comprehensively considers the influence of the characteristics of the region where the mass point is located on the spatial distribution of the protected area. The vast land space and superior natural conditions are the same foundation for the establishment of PRS in the two countries. NWPS units are concentrated in the central hills and eastern plains where urban agglomeration with large population and economic development dominate, while the NWSRS units are concentrated in the northwestern regions with small populations and pristine upstream areas. In terms of correlation, the NPRS density in both of the two countries is positively correlated to precipitation and other natural conditions, but has great differences on socio-economic characterization. NWPS unit density is positively related to the population density, economic development, lighting index and other socio-economic factors in the region. But the NWSRS density is not correlated with these socio-economic aspects. The differences in the spatial distribution characteristics of PRS reflect the differences in politics, economy and culture between the two countries:

Names and affiliations: Clare Pearson (University of Leeds), Steve Carver (University of Leeds)

Title of presentation/panel/round table discussion: A wildness-based catchment classification method for UK rivers

Format: Oral presentation (could be poster)

ABSTRACT: River systems across the globe are being manipulated, overexploited and degraded by human activity. Strategies and policies must target the areas most degraded by humans for river restoration schemes and protect those that are least modified. We use a wildness quality index (WQI), describing an absence of human impact, to identify those river catchments (watersheds) that are least modified and therefore most in need of protection. Currently, the Australian Wild Rivers Project is the only management scheme using a quantitative GIS-based river wildness criterion to assess the degree of protection applied to a river. In this paper we develop a GIS-based method for identifying river wildness in catchments across the UK based on hydrological flow accumulation across an underlying digital terrain model. Datasets of human impacts on river systems (such as land cover and agriculture) are reclassified in terms of wildness, and catchment statistics for each dataset calculated. User-specified thresholds of these statistics are used to create a catchment classification based on accumulated wildness and human impact. The outputs of the catchment classification system are analysed and compared at different catchment scales using the WWF's HydroSHEDS and HydroBASINS database. Catchments in the Scottish Highlands are seen as the wildest, whereas urban hubs like London, Manchester and Birmingham were most affected by human activity. River systems in the east of England are prone to extensive arable agriculture and those in rural Wales are prone to high densities of domestic livestock. Correlations between datasets are analysed and further analysis carried out into plotting the downstream accumulation of human impact through the river systems. The results of the analyses can be used to help protect wild rivers and target river restoration schemes.

Names and affiliations: ZHANG Qing (Beijing Forestry University), LI Dong (Beijing Forestry University), HAO Peiyao (Beijing Forestry University), FAN Shuxin (Beijing Forestry University)

Title of presentation/panel/round table discussion: Study on the biodiversity supporting function of plant landscape in the waterfront ecological corridor of Wenyu River

Format: Oral presentation

ABSTRACT: In river ecological corridors, rich landform creates diverse habitats for organisms, and the unique vegetation belt on both sides of the river can provide foraging and habitat for other organisms, which is of great significance to protect biological diversity. Based on field surveys and analysis of ArcGIS and Fragstats software, this paper studies plant species composition, community characteristics, composition and distribution of habitat elements, landscape diversity of Wenyu waterfront ecological corridor. As a result, the supporting function of plant landscape to biodiversity conservation was obtained. We recommend appropriate plant species and ecological community models that support biodiversity for corridors, aim to provide a theoretical basis for the planning and construction of ecological landscape corridors in Beijing. The main results and conclusions are as follows:

(1) Corridor's landscape degree of separation index, polymerization index, contagion, connectivity index, etc. are relatively high, reflecting the low degree of fragmentation of corridor landscapes, the convergence and connectivity of corridors is good, and the pattern of diversity is high.

(2) Analysis of plant composition shows that there are fewer plant species and lower species diversity. In general, the community structure of the corridor is relatively simple, with low community diversity and uneven distribution.

(3) There are many types of habitats in the near-natural riparian zone. Theoretically, the community structure diversity and species diversity are relatively high.

(4) Analysis of plant landscape composition and landscape diversity reflected the corridor has weak supporting function for biodiversity. Therefore, the optimization strategy of a plant landscape that is based on native plant principles and near natural community principle is proposed.

Protecting and restoring wild and scenic rivers: Ecological Flow

Names and affiliations: Sheikh Muhammad Abdur Rashid (Centre for Advanced Research in Natural Resources and Management, Carinam)

Title of presentation/panel/round table discussion: Ecological resuscitation of Ichamati River, Pabna, Bangladesh.

Format: Oral presentation

ABSTRACT: River resuscitation is an important part of the water resources management system. It can assist with balancing the needs of people and wildlife for freshwater ecosystem services. This requires an understanding of the relationship between the way a river functions and the demands of both the people and other life depending on it. The Ichamoti River originates from the Ganges River and finally falls into the Hurasagar River, later meeting the Jamuna (Brahmaputra) River. The river remains hydraulically disconnected for a substantial period of the year due to various interventions like cross-dams at off-take and closing of the river downstream for irrigation, heavy siltation and encroachments, urban waste disposal, agricultural pollutants, and many other factors. Restoration of the river is vital for reestablishment of all functions like hydrological, ecological, biological, hydro-morphological, hydraulic, economic and social, etc., for full use of its potential. The study jointly conducted by Bangladesh Water Development Board (BWDB) and Bangladesh University of Engineering and Technology (BUET) between May 2018 and June 2019 considered various options to restore the natural flow throughout the year so as to reestablish the ecological services and improve habitat for wildlife.

Names and affiliations: Diane Taliaferro (White Mountain National Forest, USDA Forest Service), Libby Langston (Langston Videophotography, Missoula, Montana, US)

Title of presentation/panel/round table discussion: Restoration and Management of Fossil Creek Wild & Scenic River

Format: Oral presentation

ABSTRACT: Fossil Creek originates in Fossil Springs Wilderness and flows through the Matatzal Wilderness and eventually into the Verde Wild and Scenic River. In 1908 the Fossil Springs Dam and Flume were built to supply water for mining and hydroelectric plants diverting up to 90% of the river's flow. In the 1990s a broad group of stakeholders led the decommissioning of the infrastructure and "re-watering" of the river took place. Fossil Creek was designated by Congress as a Wild and Scenic River in 2009 and recreationists started demanding access. Balancing the protection of geologic, biological, and cultural values with increasing recreational use and unique habitats can be challenging for managers. This presentation is to provide guidance for managers who after designation of Wilderness and Wild and Scenic Rivers have to deal with issues such as fish barrier repair, increased recreational use, or threats to traditional cultural sites. Planning documents such as a Comprehensive River Management Plan as well as Wilderness character monitoring provide important guidance. Often river and Wilderness values are interdependent. Federal designations, policy and laws are followed while ensuring values associated with Wilderness and Rivers are protected. Addressing the political pressures associated with working with other federal and state agencies who are mandated to manage fish and wildlife is key for success. Working with communities, local tribes and recreational pressures due to social media and being adjacent to urban populations often drives tough management decisions.

Names and affiliations: Ai Xin, ZHENG Xi

Title of presentation/panel/round table discussion: Rewildization of detention reservoir during non-flood period: a case study of "paddy field" reservoir in Yongding river

Format: Oral presentation

ABSTRACT: Since the 1980s, the Yongding Rver plain in Beijing has been cut off due to drought, resulting in serious soil desertification and ecological degradation. The "paddy field" flood detention reservoir serves as the flood diversion task when the upstream encounters flood once in 50 years. Far away from the city center, the reservoir, with an area of about 620 hectares, is always in a state of wastelage during the non-flood period. It is worth taking into account the formation of the regional core landscape of natural operation by restoring the "trophic cascades" to restore the free-willed ecosystem to adapt to dynamic changes during the non-flood period of several years. The aim of this study is to increase the diversity of native organisms in the forest-irrigation-grass ecosystem and restoring the natural succession process with minimal intervention. The main approaches include: 1. Rewilding of terraces, 2. Restoration of meadow ecosystem, 3. Complete "trophic cascades. Free-willed ecosystems can improve the self-regulation ability of reservoir ecology in non-flood period, and ecosystem dominated by meadow habitat can adapt and succession quickly even after flood period. This kind of natural operation landscape can be maintained independently without humans that makes the dynamic succession become a part of the wilderness landscape, which is of great significance to the ecological environment and regional landscape value of the flood detention reservoir abandoned for many years.

Names and affiliations: Debanjan Sarkar (Wildlife Institute of India), Gautam Talukdar (Wildlife Institute of India), Anindita Debnath (Wildlife Institute of India)

Title of presentation/panel/round table discussion: Lower Ganga Canal: Man-made Canal or Man-made River?

Format: Oral presentation

ABSTRACT: Agricultural productivity can be increased through canal irrigation. Lining an earthen canal is an effective method of reducing seepage loss and increasing water supply. An earthen canal can become a significant species reservoir and provide a number of ecosystem services (ES), nevertheless, these services are lost if they are lined. Lower Ganga Canal (LGC) and Parallel lower Ganga Canal (PLGC) in Narora, U.P, India; were built during the British era almost 150 years old. In this long time span, it has started functioning as a man-made river, harboring multiple numbers of riverine as well as river associated species and also creating a number of wetlands. Recently, PLGC has been lined with concrete and there was very scarce information available on the biodiversity of the two canals. We conducted surveys in these two canals from January-April 2017. We recorded 66 species of avifauna, 9 species of freshwater turtle, 2 species of crocodylian family from the canals as well as surrounding wetlands. Also, the grassy bank and water of LGC act as a food source for the livestock and supports other daily usages of locals. LGC also contributes to the economy of the local people by providing them services like fishing, providing raw materials for making ropes, baskets, mats, etc. However, due to the information asymmetry, local people were unaware of the ES and complained about the waterlogged condition due to seepage. It would be distressing if concretization happens to avoid seepage loss as both the biodiversity and ES would be affected.

Protecting and restoring wild and scenic rivers: Planning to support river protection

Names and affiliations: ZHAO Min (Yunnan University, Kunming, P.R. China), ZHANG Yuxiao (Yunnan University, Kunming, P.R. China), WU Ningyuan (Yunnan University, Kunming, P.R. China), LI Peng (Yunnan University, Kunming, P.R. China), YU Dan (Yunnan University, Kunming, P.R. China), TAO Sisi (Yunnan University, Kunming, P.R. China)

All authors are also at National Park Administration of China, National Forestry and Grassland Administration, Planning and Research Center of National Park, Kunming, 650216, P.R. China

Title of presentation/panel/round table discussion: Identifying Priority Areas of Protected River System Based Ecosystem Approach in Qingzhu River, China

Format: Oral presentation

ABSTRACT: The identification of a protected area (PA) is the key issue of PA's planning and construction. As an important component of nature conservation, identifying river ecosystems' priority has important significance in maintaining the global ecological security, promoting sustainable development of human society and protecting biodiversity. Based on an ecosystem approach (EA), we modified the current systematic conservation planning for Protected River System. We took the Qingzhu River, in Sichuan Province, China as an example and selected river, forest and human influence to establish priority area's conservation pattern model, which used species irreplaceability index, forest cover index and non-human influence degree (NHID) to characterize and by means of scoring by expert to confirm weight respectively. Research indicated that high priority conservation areas mainly distributed in headwater districts of Tangjia River National Nature Conservation in upstream river and the location where population and towns concentrated in midstream and downstream river. In addition, we divided high priority areas into middle-high priority areas, higher priority areas and the highest priority areas and the constituent ratio was 10.47%, 3.62% and 3.13% respectively, which made up proportion 17.22 % totally.. In view of it, when identifying priority conservation areas, we could decrease protection cost, increase probability in implementing and realize the smart protection.

Names and affiliations: ZHOU Yuxia (Tsinghua University), LIU Hailong (Tsinghua University), CHANG, Yi-Chang (Tsinghua University)

Title of presentation/panel/round table discussion: Zhaqu River Basin Wild River Mapping and Conservation Planning

Format: Oral presentation

ABSTRACT: Zhaqu river is the upstream of Lancang river basin, Qinghai Province. It is a significant part of Three-River-Source National Park, the source area of the Yangtze River, Yellow River and Lancang River. Zhaqu river is also one of the less human disturbed river basins in China with distinct world-class wilderness and gorge landscape on Qinghai-Tibetan Plateau. The mainstream of Zhaqu has only two small water conservancy facilities in Zadoi county and Nangqian county, and most of river reaches in the basin are under free flowing status. Thus, it could be a demonstrative pilot area for the protection of wild rivers in China. This paper will systematically analyze the Human Disturbance Index of the tributary catchment units of Zhaqu river basin, including road density, local settlement and urbanized area, degree of fragmentation and regulation due to water resource infrastructures, land-use influence, sediment trapping and other important human disturbance factors, and carry out the wild river mapping in the basin. Furthermore, through related literature review and public assessment, this paper will also analyze geology, biodiversity, hydrology, culture, aesthetics and other outstanding remarkable values of the mainstream Zhaqu. With integrated consideration of river wilderness status and related outstanding remarkable values, it will provide the classification of river segments with different attributes and propose the corresponding conservation planning of Zhaqu. In such ways, it will also become an example for wild rivers conservation planning and legislation in Three-River-Source National Park.

Names and affiliations: HAN Xuesong (Shan Shui Conservation Center)

Title of presentation/panel/round table discussion: “Nature Watch” in Namsei as an Effective Method to Develop Sustainable Livelihoods

Format: Oral presentation

ABSTRACT: Namsei Gorge is located in the source region of the Mekong River. As a typical riverine ecosystem on the Tibetan Plateau, it maintains an immense and unique biodiversity. Nowadays, however, local Tibetan herders are caught in a difficult dilemma of resource exploitation or nature conservation. To help reduce this tension, we, SHAN SHUI Conservation Center, started a community-based wildlife-watching project in Namsei called “Nature Watch”. Twenty-two families, in strict rotation to provide an equal opportunity, act as hosts to provide guiding, transportation and accommodation to visiting nature watch participants. Importantly, 100% of the income stays in the community: 45% stays with the host family, 45% goes to a community fund, and 10% to community-based conservation initiatives. By combining nature conservation and community development, the project directly motivates the local community to participate in long term conservation actions, including community-based wildlife monitoring, grazing management and habitat restoration. Beyond Namsei, in past five years, SHAN SHUI has funded over 50 local NGOs in the upper Mekong Region, joining the fragile efforts into a united and powerful conservation force in China.

Protecting and restoring wild and scenic rivers: Panel: Continued threats and remaining promises for the World's free-flowing rivers

Names and affiliations: Samir Mehta (International Rivers, South Asia Program Director) | Suresh Babu (WWF India - Rivers, Wetlands & Water Policy Team) | Denielle Perry (Northern Arizona University)

Title of presentation/panel/round table discussion: Continued Threats and Remaining Promises for the World's Free-Flowing Rivers

Format: Panel of speakers

ABSTRACT: As pressures mount to develop hydropower and irrigation infrastructure projects as a response to economic development initiatives and global warming, free-flowing rivers are increasingly being degraded. Left in the wake of dam building and water diversions are compounded critical ecosystem service losses, not least of all biodiversity habitat, clean water, and cultural renewal. Understanding the extent to which free-flowing rivers still remain on the planet and the gaps in river protection is vital for identifying critical locations in need of protection. This session considers the connectivity status of the world's rivers, global hotspots for dam development, and strategies for protecting free-flowing rivers in South Asia. Samir Mehta will explore initiatives developed by South Asian communities to protect free-flowing rivers from challenges of drying rivers, dams, pollution encroachments and a falling groundwater table. Suresh Babu will share findings of an analysis done to map the last remaining free flowing rivers in the Himalayan state of Uttarakhand; a proposed definition of Wild Rivers in the Indian context and methods to identify them, a map of remaining Wild Rivers in Uttarakhand; a need for undertaking a similar national level mapping and possible pathways for protection of these rivers. Most importantly, it will present a case for a paradigm shift from the current approach of "rejuvenation after degradation" to "conservation before degradation". Denielle Perry will present a synthesis of dam development hotspots around the world and a gap analysis in current river protection policies.

Protecting and restoring wild and scenic rivers: Tools, techniques, and testing grounds for the implementation of durable river protections

Names and affiliations: Panel Moderator: Denielle Perry (Northern Arizona University) | David Moryc (American Rivers) | Grant Wilson (Earth Law Center) | John Zablocki (The Nature Conservancy) | Monti Aguire (International Rivers Latin American Program)

Title of presentation/panel/round table discussion: Tools, Techniques, and Testing Grounds for the Implementation of Durable River Protections

Format: Panel of speakers

ABSTRACT: Free flowing rivers are among the most threatened of earth's natural systems. They are also among the least protected. Permanent legal protections for ecologically and socially important and vulnerable river ecosystems are necessary to ensure the long-term health and viability of rivers and the communities that depend on them. Growing recognition of this need has resulted in various policy initiatives towards advancing permanent protections. This panel comprises of professionals presenting on various policy options and their potential application for durable river protections from the country to global scale. David Moryc, Senior Director of American Rivers' Wild and Scenic Rivers program will provide insight into the history, efficacy, and implementation challenges of the world's preeminent river conservation policy, the Wild and Scenic Rivers Act of 1968. Grant Wilson, Directing Attorney of Earth Law Center, will analyze the growing movement to elevate the legal status of rivers under the law, from human property to legal entity with rights. His synthesis considers emerging legal trends and best practices in the rights of rivers movement. International Rivers' Latin America program Director, Monti Aguirre, will discuss the challenges, solutions and results of efforts by networks in Chile, Colombia, and Peru to develop legal, technical/scientific, communications and river protection movements strategies for permanent legal protections of their rivers. John Zablocki of The Nature Conservancy will discuss the lack of a global framework for free-flowing river protection and attempts to answer: What might a global policy framework and multi-stakeholder initiative for permanent river protection and restoration look like? What opportunities exist at the national and regional levels, and what is needed to equip these efforts for success? The presentation will ground some of these questions in context by focusing on southeastern Europe as a case study. Wild and Scenic River expert, Denielle Perry, will moderate the session.

The centrality of indigenous peoples and local communities to the future of life on Earth / post-2020 global biodiversity framework

Names and affiliations: Ms. Holly JONAS - International Policy Coordinator, ICCA Consortium - Mr. Sutej HUGU - Regional Coordinator for East Asia, ICCA Consortium - Dr. Jonathan BELL - Director, Being Human Initiative, National Geographic Society

Title of presentation/panel/round table discussion: The centrality of indigenous peoples and local communities to the post-2020 global biodiversity framework: diverse perspectives

Format: Round table discussion proposal

ABSTRACT: This session is envisaged as a prominent panel-roundtable to tackle one of the main topics of the Congress: the vision for the post-2020 global biodiversity framework. It will feature a number of different perspectives that together make a compelling case for why indigenous peoples and local communities are central to the post-2020 global biodiversity framework.

Two major UN-backed reports have together conveyed the necessity of making drastic changes to our societies within the next 10-12 years to avoid global climatic, ecological and economic collapse. As citizens, governments and companies alike come to terms with these existential conclusions, it is clear that decisions taken in the next few years will be crucial for defining the future of no less than life on Earth. One of these decisions is known as the post-2020 global biodiversity framework; it is being developed now for eventual adoption in October 2020. It will be the successor to the UN Convention on Biological Diversity (CBD)'s Strategic Plan for Biodiversity 2011-2020, implementation of which has fallen far short of what is needed to stem the tide of global biodiversity loss. With the global state of biodiversity and nature even more dire than in 2010, it is clear that the

One of the most important opportunities to transform our approach to biodiversity and nature has come to the fore in the last few decades. Global studies have estimated that indigenous peoples and local communities collectively hold at least 50% of the world's land and are the stewards of up to 80% of the world's biodiversity. Awareness is growing of the significant contributions of indigenous peoples' and local communities' collective actions to biodiversity and essential ecosystem processes such as watersheds and climate regulation and to sustainable and locally appropriate livelihoods and economies. The transformative opportunity thus lies in strengthening, sustaining and securing the territories and areas collectively conserved by indigenous peoples and local communities, also known as ICCAs or territories of life.

As the process to develop the post-2020 framework gains momentum, some conservation organisations, foundations and scientists are promoting 'apex' targets such as protecting and conserving 30% of the planet by 2030, developing ambitious campaigns such as Half Earth and One Earth, and calling for science-based agreements such as the Global Deal for Nature and New Deal for Nature and People. One thing is clear: goals and campaigns like '30 x 30', Half Earth and the Global Deal for Nature cannot be achieved without recognising indigenous peoples' and local communities' rights, responsibilities and self-determined approaches to conservation. Indeed, effective and equitable nature conservation embraces a diversity of governance types and management categories for both protected and

conserved areas, including areas under the stewardship of and championed by indigenous peoples and local communities.

To a greater or lesser degree, most of the post-2020 goals and campaigns proposed so far mention the importance of recognising the rights and contributions of indigenous peoples and local communities to conservation. However, there are legitimate concerns that such area-based spatial targets could lead to more top-down conservation and conflicts with indigenous peoples and local communities, including through the establishment and expansion of exclusionary, increasingly militarised and strictly protected areas. Conversely, if large conservation organisations and related campaigns appropriately engage indigenous peoples and local communities in decision-making around protected areas and integrate key concerns and messaging from the grassroots in their positions and statements, they could make a big difference in increasing visibility and public and political momentum in support of ICCAs—territories of life.

This session is envisaged as a hybrid panel-roundtable to be featured prominently in the programme. Each speaker will concisely convey their position and key messages (using case studies accompanied by compelling visuals prepared with the support of National Geographic Society) and then convene for a moderated roundtable discussion. It will feature diverse perspectives to provide Congress participants with a multifaceted and well-rounded understanding of the key issues at stake, including:

- The spiritual and cultural case – indigenous elder or spiritual advisor (tbd from ICCA Consortium or AIPP)
- The scientific case – scientist/conservationist (National Geographic Explorer)
- The human rights and equity case – human rights/social justice advocate (e.g., from Campaign for Survival and Dignity)
- The economic case – sustainable livelihoods specialist (e.g., from Foundation for Ecological Security or Deccan Development Society)
- The policy and political case – Ashoka Trust for Research in Ecology and the Environment or politician/government official
- The moral and ethical case for intergenerational and/or interspecies equity – indigenous youth or woman (tbd from ICCA Consortium or AIPP)

The centrality of indigenous peoples and local communities to the future of life on Earth: presentations

Names and affiliations: Adriano Jerozolinski (Associação Floresta Protegida), Barbara Zimmerman (International Conservation Fund of Canada / Environmental Defense Fund)

Title of presentation/panel/round table discussion: Large Scale Forest Conservation with an Indigenous People in the Highly Threatened Southeastern Amazon: the Kayapo

Format: Oral presentation

ABSTRACT: The 280,000 km² of indigenous lands and protected areas of the Xingu river basin form a continuous forest corridor inhabited by 25 indigenous peoples and traditional riverine families. Immersed in one of the world's most intense deforestation zones, the southeastern Brazilian Amazon, the Xingu indigenous lands and protected areas network exemplify how the struggle of forest people for official recognition of their traditional territories associated with the Brazilian government's land use policy has been effective as a strategy for guaranteeing forest protection. But ongoing political changes in Brazil associated with a new development plan for the Amazon region, which includes in its strategy weakening of indigenous land rights and environmental policies, mining and large scale agriculture on indigenous lands, and new infrastructure works, suggest that these gains may prove ephemeral unless these protected areas and their socio-environmental value are recognized and supported. Here we examine the conditions that enable and threaten the Kayapo's continued effectiveness against deforestation and identify strategies for continued protection. We show that the constitution and strengthening of Kayapó Organizations (KO) has proven to be a key factor to guarantee the protection of over nine million hectares of primary forest on their contiguous ratified territories. We found that KO have been very effective in managing projects with governmental and non-governmental agency support, guaranteeing the necessary conditions for associated Kayapó communities to sustainably manage their territories. In the last six years a new gold mining cycle took place in Kayapó territory, resulting in rampant invasion and unprecedented deforestation, a process that is likely to intensify.

Names and affiliations: Benjamin Cruse (Eden Local Aboriginal Land Council, New South Wales, Australia)

Title of presentation/panel/round table discussion: Increasing Certainty for Aboriginal People in Stewardship Processes

Format: Oral presentation

ABSTRACT: Owing to Government`s breaches to Regional Forest Agreement Processes (RFA`S) in Australia, Aboriginal People are increasingly reluctant to sign off on future commitments or actively participate in agreement processes with Governments in formation of collaborative arrangements for bio-diversity protection. Increased Aboriginal management input in the process result in shared outcomes and better protection of the natural environment, Aboriginal cultural heritage; mainstream recreational opportunities; Tourism; Forestry operations; and both: National Parks activities; and Wilderness declarations. Successive Australian governments breached their International commitments to protect Aboriginal People`s Rights in Australia under the United Nations Stockholm Conference 1972 resolution on the Human Environment and the United Nations Conference on Environment. And, Development (UNCED) Rio De Janeiro 1992 Conference resolution. Both the Stockholm and Rio De Janeiro World Conferences attempted to address many of the identified issues as will the March 2020 Jaipur India World Conference. Problems associated with the RFA`s said breaches were that too much was left for chance and that Aboriginal People and other Stakeholders operated under an element of naivety and relied too much on trust. To assist in the avoidance of such future breaches, my presentation will also cover the need to underpin and register agreements. Underpinnings are needed to prop up or protect Aboriginal rights. A register is needed to record Aboriginal claims and recommendations and protective mechanism inclusions are needed to ensure that what Aboriginal People say at grass roots level is not changed or lost as it goes through the various levels and spheres of government.

Names and affiliations: Chansa Chomba, Bevy Chabwela

Title of presentation/panel/round table discussion: The resource potentials and the struggle for management: a case of Kafue Flats and Bangweulu Swamps, Zambia (1615 - 1630).

Format: Oral presentation

ABSTRACT: This review paper explores and discusses the resources of the Kafue Flats and Bangweulu swamps and how it has been a struggle to manage them. Although these wetlands could provide considerable contribution to the economy of the country, most critics agree that the principle on which protected areas were established generally seems not to make much sense, at least both in the Kafue Flats and Bangweulu Basin. Conservation through protected areas meant tribal powers of the inhabitants being withdrawn and the traditional methods of exploiting resources such as fish, wildlife or livestock grazing were discouraged and considered destructive. But evidence has shown that the existence of the more than 15 tribal communities which, until today, continue to inhabit both of these areas, was sustained by the availability of the resources present, and it is further argued that the existing legal arrangements which emphasize restrictions but which ignore the longtime relationship between tribal communities and wetland environments have not succeeded. The paper further discusses that although common resource systems have been known to collapse due to overexploitation resulting in over-fishing, deforestation, over hunting of wildlife, we argue that governing the commons through institutional structures such as Community Based Natural Resources Management (CBNRM) and Co-Management remains an essential available option.

Laying down our ideological arms: a dialogue on wilderness, re-wilding and our relationships with Mother Earth

Names and affiliations: Ms Holly JONAS - International Policy Coordinator, ICCA Consortium - Mr Sutej HUGU - Regional Coordinator for East Asia, ICCA Consortium - Dr Jonathan BELL - Director, Being Human Initiative, National Geographic Society

Title of presentation/panel/round table discussion: Laying down our ideological arms: a dialogue on wilderness, rewilding and our relationship with Mother Earth

Format: Round table discussion proposal

ABSTRACT: The notion of wilderness is at the heart of the WILD Congress and, more broadly, of many conservation interventions. For some, this concept is well understood and underpinned by a clear rationale and conservation imperative – that humans are the biggest threat to nature and that we need to protect the rest of the planet from ourselves. For others, this concept evokes a romanticised ideal of ‘wild nature’ existing without people (and vice versa) and an unnatural separation between nature and culture. Similarly, the notion of rewilding is becoming increasingly commonplace in conservation practice, especially with growing awareness of the crucial importance of restoration for healthy ecosystems. But to what state are we aiming to ‘rewild’ nature – to a time before humans existed? What does this mean for human societies or for the extraordinary biodiversity nurtured and sustained by people over generations and millennia? The discourses on wilderness and rewilding are rich and varied, with at least as many disagreements and divergences as potential synergies.

However, the issues go far deeper than just intellectual debate. As global pressures on biodiversity and nature continue to mount and stakes grow for effective conservation measures, battle lines – both figurative and literal – are being drawn between nature and people with increasingly severe consequences. The time is now to lay down our ideological arms, to be honest with ourselves and each other about our values, motivations and biases, and to reconnect as fellow humans – after all, every single one of us, without exception, depends upon nature for survival and wellbeing.

This session is envisaged as a guided debate/dialogue intended to unpack – and potentially redefine – the meanings of ‘wilderness’ and ‘rewilding’. It will consist of a number of micro-debates, bringing together pairs of people (either pre-selected speakers or among all participants in the session) with divergent perspectives for 3-5 minutes of exchange. Potential questions for debate include:

- The meaning of ‘wilderness’: does it include or exclude people?
- Are strictly protected areas the best way to achieve or support ‘wilderness’?
- Does ‘rewilding’ mean we are helping nature get back to its pre-human state?
- Are nature and culture indivisible?
- To what extent is the notion of ‘wilderness’ more important to people from heavily industrialised societies?

- Is the notion of 'wilderness' incompatible with indigenous peoples' and communities' worldviews and relationships with their territories of life?

The micro-debates will be followed by brief presentations of grassroots efforts to restore nature and biodiversity and reconnect people and communities around shared natural and cultural commons. The final part of the session will consist of a facilitated dialogue on key themes and issues.

Wilderness, re-wilding and our relationships with Mother Earth: presentations

Names and affiliations: Dr. Fabienne Jeanne Joliet (Agrocampus Ouest, Angers, France)

Title of presentation/panel/round table discussion: It's time to reconsider the Western idea of wilderness and to promote a plural vision of wild nature: the Inuit idea of Mother Earth (Nunavik, Canada)

Format: Oral presentation

ABSTRACT: The concept of Wilderness was born in the United States in the nineteenth century, and by feedback loop it has won Europe and the West. Wilderness has become today an international banner, brandished by NGOs in particular, but the fact remains that the visions of nature have not been reduced to the Western vision and its dissemination by the English language. Indeed, the perimeter of the wilderness is superimposed on that of the cultures of the world, far beyond that of Western civilizations. In the Arctic confines, in Nunavik, like many other parts of the planet inhabited by natives, the protection policies of the Wilderness and Inuit visions of protection of Mother Nature are combined. What is the vision of nature in Nunavik? How can Canada's creation of national parks be combined with the sustainability of traditional Inuit hunting and fishing? How to achieve a co-construction of knowledge and collaborative actions that allows the protection of Arctic nature? The Western paradigm of the Anthropocene, the concept of mesology, which revise the concept of nature "object" by re-entering it in its societal context would it not allow a plural vision - and not a single thought - that lead to common actions in the name of the "wild" nature of the world?

Names and affiliations: Xinyu Xu (Tongji University), Yuhan Shao (Tongji University), Arai, Tongji University

Title of presentation/panel/round table discussion: The Impact of Settlement Policy on the Perception towards Wilderness of Grassland Nomads: A Case Study of Chinese Kazaks in Yili, Xinjiang

Format: Oral presentation

ABSTRACT: Different living habits, spiritual beliefs and ways of using the wilderness of different ethnic groups lead to diverse perceptions of the wilderness, including the definition, the perception of the physical elements in the space and the invisible qualities, thereby affecting their attitudes towards the wilderness, which addresses the conservation and use of wilderness. The study which takes Kazaks in Yili, Xinjiang as an example, who have a generation affected by the settlement policy (age between 26 and 45 years old), aims at analyzing their perceptions and attitudes to grassland wilderness where they live and gain the means of production in several dimensions by the method of questionnaire and semi-structured interview, and engaging with their conservation and use of wilderness to parsing the interaction with grassland wilderness. Comparing with the formal notions on wilderness, and with perceptions of wilderness by the previous and next generations, this paper briefly discusses the impact of settlement policy on the perceptions and utilizing attitudes of nomads towards the grassland wilderness where they live, so as to seek the possibilities of inspiring the protection and utilization of the vast grassland wilderness in northwest China.

Names and affiliations: Richard Swain (Invasive Species Council, Victoria, Australia)

Title of presentation/panel/round table discussion: When the push for wilderness protection becomes a culture war: an Australian Aboriginal response to feral horses in Kosciuszko National Park.

Format: Oral presentation

ABSTRACT: The push for Kosciuszko National Park's wilderness, alpine areas and nature to be protected from invasive species has turned into a culture war. In 2018, an act was passed in the state of NSW, Australia to recognise and protect the heritage values of feral horse populations in Kosciuszko National Park. This legislation was based on recent Anglo-European assertions that feral horses symbolise colonialist links. It ignored extensive damage to the park's springs and river catchments and endangered plants and animals, and Aboriginal cultural connections to that landscape. Kosciuszko National Park was a place for Aboriginal tribes to meet, practice ceremony and follow traditional pathways. A traditional narjong (water) healing ceremony was held as an open invitation for all modern Australians to accept the Australian landscape as their heritage, and the responsibility of caring for it and protecting it as their culture. In the first of its kind in 150 years, the ceremony brought together men and women from across the country to the birthplace of the Murrumbidgee River. Ways for Australia to rebuild stronger connections to its first peoples and their special places, and native plants and animals are discussed.

Name and affiliations: Maria Beatriz Nogueira Ribeiro (Associação Floresta Protegida), Adriano Jerolimski (Associação Floresta Protegida), William Ernest Magnusson (Instituto Nacional de Pesquisas da Amazônia), Barbara Zimmerman (International Conservation Fund of Canada / Environmental Defense Fund)

Title of presentation/panel/round table discussion: Sustainable economic alternatives as a strategy for forest conservation: The case of Brazil nut and the Kayapó indigenous people in southeastern Amazonia

Format: Oral presentation

ABSTRACT: Indigenous territories protect 23% of the Brazilian Amazon. In southeastern Amazonia, the Kayapó Lands are inhabited by 9400 Kayapó people and form a block of 10.6 million hectares of protected forests in one of the most aggressive frontiers of deforestation of the Amazon. In the last decades, pressure of illegal and predatory economic activities have threatened not only forests and rivers, but also the Kayapó peoples' physical and cultural survival. Since 2006, local Kayapó organizations have invested in initiatives to generate income from sustainable activities. Among them is the commercialization of Brazil nuts (*Bertholletia excelsa*). The Brazil nut tree is native to Amazonia and its seeds are produced almost exclusively in the wild. Brazil nut trees are abundant in Kayapó Lands and are traditionally harvested by the Kayapó. The development of a structured production chain in the last 12 years allowed the Kayapó to enhance production, achieve differentiated markets and increase financial return for harvesters. Besides being a sustainable activity, Brazil nut harvesting values traditional practices and the standing forest. The revenue generated decreases the vulnerability of the Kayapó to illegal and predatory activities. In the last five years, Brazil nut harvesting generated one million US dollars and benefited 54 Kayapó villages. Together with other sustainable economic initiatives, Brazil nut commercialization has been an important piece of a strategy to enhance life quality of Kayapó people and protect their forests.

Indigenous peoples, local communities and nature conservation in South Asia: a dialogue on current issues, alternatives and ways forward

Names and affiliations: Arlo Hemphill (I am Wilderness LLC), Moi Vicente Enomenga (Nacionalidad Waorani), Felipe Enquieri (Nacionalidad Waorani)

Title of presentation/panel/round table discussion: Developing Digital Tools to Advance Indigenous-Led Ecotourism

Format: Oral presentation

ABSTRACT: Leaders among Ecuador's Waorani indigenous group have chosen to pursue ecotourism as a means to balance economic stressors with the people's strong desire to maintain cultural and ecological values. The group first made formal contact with Western Society in 1958 and have since been the subject of near constant controversy over their Amazonian land claims due to the discovery of large oil reserves beneath their traditional territory. In 1990 the indigenous group won formal legal title to the Waorani Ethnic Reserve, encompassing 6,125.60 km² (2,365.11 sq mi) of Amazonian primary rainforest. Despite this legal victory, the Waorani continue to struggle with external pressures, including how to balance their traditional lifestyle with the economic pressures of the outside world with which they now co-exist. Having learned principles of ecotourism management over several decades working with outside operators, a group of Waorani leaders have formed Nomka Travel, the first Waorani-led tourism operator in their history. I am Wilderness LLC, a US-based environmental consultancy, partnered with Nomka Travel to deliver a series of digital tools to help promote and launch Nomka Travel's formal operations. Inspired entirely from Waorani concepts and built in direct partnership with the Waorani people, the online tools include a Wao-Spanish-English dictionary, a cultural engagement site, and a traditional tour operator website.

Names and affiliations: Salam Rajesh (Manipur Nature Society, Imphal, Manipur)

Title of presentation/panel/round table discussion: Participation of local communities in conservation strategy vital to achieving success in conservation of wilderness landscapes

Format: Oral presentation

ABSTRACT: Conservation of wilderness landscapes in the broad sense essentially requires both governmental support and active participation of indigenous peoples who are integral to the landscape(s). Conservation requires strategies that are vital to the human population which thrives in the vicinity of wilderness to be conserved and who largely depend upon the resources available in that landscape for their living. It has been seen in many instances of intense conflicts when governments try to evict indigenous peoples from forest lands or wetlands in the name of conservation, which naturally results in abstract failure of the objective or purpose of conservation. There has to be a functional strategy that incorporates the interests of indigenous people who thrive upon the resources of that wilderness landscape in mapping out a long term strategy for conservation of the particular wilderness landscape. Conservation cannot succeed in isolation of participation of local people who actually live next door to the landscape and whose activities directly or indirectly influence changes to the landscape. The involvement of local people/communities in long term strategy formation is the key to the success for conservation of a particular wilderness landscape. To achieve this, capacity building of village communities through Community Rural Appraisal exercises and designing of socio-economic activities for enabling livelihoods can be key components of such a strategy. Networking of local youths and women organizations, in close coordination with governmental agencies, is vital to the success of any conservation program.

Names and affiliations: Pijush Kumar Dutta (WWF India)

Title: Managing Community Conserved Areas: Lessons from the eastern frontier of India

Oral Presentation

ABSTRACT – Two-third of forests in the Indian state of Arunachal Pradesh are categorised as Un-classed State Forest, most of which are owned by local communities and different clans. WWF India started working with local communities in 2003 for promoting community stewardship, that resulted in designating 120,000 ha of community owned forests as Community Conserved Areas (CCAs) in the districts of Tawang, West & East Kameng. CCAs are to be managed by representatives of local communities, grouped as CCA Management Committees. Capacity Building of these Management Committees have been done, and they have been monitoring biodiversity within the CCAs, as well as regulating commercial use of natural resources, however, non-consumptive income from forests needs substantial strategic planning.

Indigenous peoples, local communities and nature conservation in South Asia: presentations

Names and affiliations: Aman Singh

Title of presentation/panel/round table discussion: 'CCAs' Inherently Conserving Biodiversity, Protecting Cultures & Livelihoods of Local and Pastoral Communities in Thar Desert

Format: Oral presentation

ABSTRACT: Today, the rural agro-pastoral communities in south Asia (particularly in India) are subsisting in a hand-to-mouth fashion on distressingly meager resources. Yet they have had one support system that has helped them weather any crisis they were confronted with from time immemorial. The source of the vital assistance that enables these communities to surmount even the most extreme hardships are the community conserved areas (CCAs), or common property resources (CPRs), what is locally known as the 'Oran' and 'Gochar' in the Thar Desert, India. Other CCAs includes wetlands, river and hill systems, panchayat and community forests. CCAs are a pan-Indian phenomenon, known by different names in all parts of the country. In the south, in Kerala they are known as Kavu, in Maharashtra and Karnataka as Devrais and Devkadu, in Bihar as Sarnas, and in Meghalaya as Lyngdoh, to name a few.

'Oran' and 'Gochar' survived through the ages due to their revered status that precludes unsustainable utilization and have always provided a much-needed lifeline and safeguard to their respective communities. They have done so by acting to unify people religiously, culturally and socially while providing a forum for village-level discussions, festivals and other social events; through provision of much needed sustenance for people and livestock through the 'Talabs' or rainwater harvesting structures, streams, wells or other water sources present in every Oran, as well as grazing pasture.

Names and affiliations: Chhavi Bathla

Title of presentation/panel/round table discussion: Governing the Commons: Community-based access regimes for extraction from *Boswellia serrata* gum in a Central Indian Adivasi village

Format: Oral presentation

ABSTRACT: Since antiquity, Indian forests have played a paramount role in the subsistence of rural communities especially the Schedule Tribes. These forests have also witnessed ominous pressure emanating from the development paradigm in the colonial as well as the post-colonial era. Consequently, a range of policies relating to the forests has been enacted which are not mutually consistent and internally coherent. These policies with the goal of sustainable use, poverty eradication and biodiversity conservation and forest regimes which have ranged from decentralized to extremely centralized become the reason for the contestation among the marginalized forest-dwelling communities. This study focuses on the rights and access over a high-value NTFP collected by an adivasi community of central India. The Sahariya community of village Agara, in district Sheopur, of Madhya Pradesh collects and sells highly commercialized gum Indian frankincense, which is extracted from *Boswellia serrata* trees. The most intriguing part of the study is the understanding of the enforceable community-based norms which have survived the changing legal and policy regimes of governance. These community-based laws or traditional governance have created a governance regime that uses a state-owned Reserve forest as virtually private forest plots owned by different Sahariya families. The study also focuses on how the benefit from the extraction of gum is distributed differently among the major social groups within the village. Conclusively, the study contributes to the literature in political ecology that highlights the need for careful interdisciplinary studies at the local scale to elaborate larger relationships between local, regional, national and global discourses on sustainable resource use.

Names and affiliations: Mahesh Ghate (Pradeep Singh Bisht and Shepherds community of Rudranath)

Independent Project: Shepherds of Himalayas

Title of presentation/panel/round table discussion: Shepherds of Himalayas: On the trails of Palsi's in the alpine meadows of Rudranath, Garhwal, Uttarakhand

Format: Oral presentation

ABSTRACT: Shepherds of Himalayas is a recently initiated project which will explore the traditional and ecological knowledge of shepherding communities in Indian Himalayas by following their journey as they spend nomadic / semi-nomadic existence searching for better pasture. It aims to contribute towards documentation of shepherding practices, their tradition, challenges they are facing as well as their lifelong experiences in these harsh Himalayan landscapes. The long term objective of this project is to explore ways to conserve this fragile Himalayan ecosystem, its wildlife and its people with the active participation of these local shepherding communities, utilizing their lifelong learning about these landscapes. This is the first attempt (to our knowledge) towards understanding the life of transhumance shepherds of alpine meadows in Rudranath and how it is changing with respect to time. The alpine meadows throughout the Himalayas are already degrading due to various factors such as climate change and various anthropological pressures. The study of indigenous knowledge of local people who have known these areas from many years would be able to give valuable information which can be used as baseline data to conserve this ecosystem. This presentation will be given by adopting storytelling approach mainly focusing on the transhumance existence of shepherds as they travel from valleys to alpine meadows of Rudranath depicting their life in camps, their indigenous practices and traditions, their gods, their concerns and wildlife conflicts as well as their oral perspective on the meadows and its landscapes.

Wildlife and communities: searching for ethical solutions to conflict Part 1

Names and affiliations: Melanie Hill (Director of Communications & Outreach, the WILD Foundation)

Title of presentation/panel/round table discussion: Working Together to Coexist with Black Bears in Boulder, Colorado

Format: Oral presentation

ABSTRACT: Home to some of the most diverse wildlife populations in all of Colorado, Boulder County has successfully protected more than 67% of its 474,322 total acres of land. Considering the region's close proximity to wild habitats, interactions with a number of species are fairly common; with one in particular being the black bear, *Ursus Americanus*. Each year in Boulder, conflicts with black bears typically arise when the omnivores emerge from hibernation in the spring, and as the bears enter their intense phase of eating (hyperphagia) in the fall. Unsecured trash and compost, unharvested fruit, bird feeders, livestock, beehives, and other edible items lure bears into the city and surrounding neighborhoods. As a consequence, bears become habituated to urban life and require physical management action to be taken. The presence of black bears also poses a threat to human safety as well as other matters relating to property damage or livestock losses. However, as demonstrated in a 2018 community survey, Boulder residents proved to be quite tolerant and supportive of the local black bear population, even if they may be dangerous, cause problems, or are hazardous. In response to the community's concerns, a number of local organizations have come together to support a variety of creative solutions that will help reduce human-black bear conflicts. By facilitating regular black bear working group meetings and working with local stakeholder groups, this initiative aims to strengthen existing community engagement efforts and create new opportunities for citizen involvement. Examples of these efforts include a jointly-managed "bearsitter" program, community fruit harvests within Boulder's urban areas, the creation of a native forage buffer zone, the development of motivational outreach materials, and implementing new ambassador groups.

Names and affiliations: Mohammed Golam Rabbi (Bangladesh Forest Department)

Title of presentation/panel/round table discussion: Human-elephant conflict and mitigation measures in Bangladesh

Format: Oral presentation

ABSTRACT: Bangladesh has about 14.8 million hectares of land, of which 2.53 million hectares (17.49%) is forest cover. This includes 2.26 million hectares of state-owned forest reserves and protected areas which is home to varied wildlife species including elephants and Bengal tigers. The largest population of elephants in the country is in the Chattogram Hill Tracts region. Elephants also inhabit areas in Mymensing, Sylhet, Chattogram and Cox's Bazar. Human-Elephant Conflict (HEC) has become a national issue for conservationists in the last decade. Due to fragmentation of habitat, elephant ranges have become confined to small patches occupied by a single herd or a few small herds. Some corridors have been totally abandoned due to degradation of forest cover, extension of human settlements, intensification of agricultural practices, unsustainable slash and burn practices, unplanned road construction, establishment of monoculture forests etc. As of January 2018, Bangladesh hosts almost one million Rohingya at Ukhia, Cox's Bazar, which is well known for an important corridor for Elephants. As a consequence of that, HECs have happened on the edge of the refugee camp, causing several human deaths. Forest Department records state that from September 2009–March 2019, 183 humans were killed and 25 were injured by Elephants; 89 Elephants were killed and 580 households and agriculture fields were damaged. To mitigate the Human-Wildlife Conflict, the Government of Bangladesh adopted a compensation policy in 2010 and provides compensation (BDT 1 Lac for dead and BDT 50 thousands for injured person's family). Under this policy, BDT 30.4 million was distributed to 842 affected families. The government has adopted several conservation mega projects along with effective management of protected areas and a mass awareness program.

Names and affiliations: Esteban Payan (Panthera Colombia), Carlos Valderrama (Panthera Colombia), Elisa Bravo (Panthera Colombia), Rafael Hoogesteijn (Panthera Brazil)

Title of presentation/panel/round table discussion: Coexistence between humans, jaguars and pumas can heighten livelihoods

Format: Oral presentation

ABSTRACT: The usual conception is that jaguars (*Panthera onca*) and pumas (*Puma concolor*) can be detrimental to human rural livelihoods. Here we present evidence showing that the contrary can be true and even scaled up. Model antipredator ranches are one of our tools to tackle human-wildcat conflict through best practices in animal production. These strategies range from solar-powered electric fencing, to night corrals, to using defensive creole cattle breeds to protect livestock and light and sound mechanisms and better management of pastures, water and protein banks. Model ranches are chosen on the basis of: 1. having active depredation 2. located along the jaguar corridor 3. existing rapport with the owner with proven interest and desire to work for wildlife, and 4. having all year access to farms and properties. Chosen ranches are characterized in socioeconomic terms, and an antipredator strategy, adapted to the local reality, is selected in a participatory way with the owner. Chosen ranches receive antipredator materials from Panthera and the beneficiaries contribute the labor, receive training, apply maintenance to said intervention and sign a non-hunting and non-logging agreement. Results borne from 50 monitored model antipredator ranches show not only a decrease or cessation of depredation from wildcats, but an improved production from meat, dairy, birth rates, and improved sanitary or reproductive health. Additionally, benefits include several of the UN's sustainable development goals: improved food security, poverty reduction, women empowerment and even first access to electricity. All of the above is a product of attaining coexistence with jaguars and pumas, a subsidy from nature. Indeed, an improvement, and a heightened livelihood, thanks to living with wildcats.

Names and affiliations: Dr. Deepanjali Lal (Wildlife Biologist, Hope & Beyond)

Title of presentation/panel/round table discussion: Conservation of Leopards in Jaipur Forest Area Through Scientific Mitigation Techniques

Format: Oral presentation

ABSTRACT: Indian Leopard (*Panthera pardus fusca*) is considered the wittiest of all big cats in nature. Indian leopard has maintained its position at the top of the food chain in several forest areas of India. In Jaipur forest which spans 948.68 sq.km., the existence of the leopard is under constant threat due to an ever-increasing leopard population and ever-decreasing habitat. Leopards have started moving out of their safe zones and into areas of human settlement. We felt the need to become fully aware of the rampant situation of Human-Leopard-conflict in forest fringe areas. Organized surveys and analysis of primary government data raised an urgent question regarding the mutual relationship and survival pattern of humans as well as leopards residing in the same locality. Many incidents of leopard attacks on cattle, small domestic mammals and even humans have alerted the public and government to the gravity of the situation. This research deals with various mitigation techniques and safety measures with their outcomes followed by scientific management of human leopard conflict in the future. Mitigation techniques included raising general awareness and educating the villagers about leopard behavior and animal instincts, training informers and local troopers about sustainable livelihood options, predator proof livestock sheds, I-Cow technique, halogen lamps and cattle bell techniques; which had been implemented in conflict hot spots. These mitigation techniques were scientifically synthesized to reduce the dependency of leopards on livestock. I-Cow technique surprises the predator which gives extra time for the prey to escape. Halogen lights over livestock sheds kept that area illuminated. Cow-bells were used as a signal for villagers of an attack and immediate rescue of their cattle. Conflict prevention, such as live monitoring interventions, could also be improved with maps that were developed during the survey that identified vulnerable villages.

Wildlife and communities: searching for ethical solutions to conflict Part 2

Names and affiliations: Jose Louies (Wildlife Trust of India), Vivek Sharma (Indiansnakes.org)

Title of presentation/panel/round table discussion: Connecting dots: Building a nationwide network of rescuers using social media and digital tools

Format: Oral presentation

ABSTRACT: Urban wildlife rescuers are the most widespread conservation warriors across the country. Many of them are not part of any organization or agency but with wildlife rescue they are passionate about what they are doing. Across India, every year thousands of snakes are rescued from human-snake conflict situations by rescuers. These rescues may be the highest of such interventions where both human and animal life is saved from potential danger. The idea of having a national level platform for such rescuers was initiated in the year of 2010 and today the “ Team Indiansnakes “ is the largest such rescue network group which is active both online and on the ground where members of the group undertake rescue work as volunteers. This network was made possible because of the effective use of social media and digital tools which connected the rescuers across the country and enabled them to learn from each other. Indiansnakes.org and the associated social media group in Facebook act as the central system of this network along with whatsapp groups. A specially designed mobile app and backend technology enable centralized data collection, monitoring and processing. The team managed to conduct a nationwide survey of medically important snakes using the app and technology which provided valuable information about the exact distribution and occurrence of big4 venomous snakes across the country in 2017-2108.

Names and affiliations: Isidore Gnonlonfound (Laboratory of Biomathematics and Forest Estimations (LABEF) & Laboratory of Applied Ecology (LEA), Faculty of Agronomic Sciences, University of Abomey-Calavi, Cotonou Benin)

Title of presentation/panel/round table discussion: Perceived effects of elephants (*Loxodonta africana* Cuvier) presence and impacts on ecosystem services supply in the Pendjari Biosphere Reserve, West Africa

Format: Oral presentation

ABSTRACT: Information on how biotic factors correlate with ecosystem services (ES) supply in natural systems is important for holistic landscape management. In this study, we assessed the perceived effects of elephants' presence on ES supply in the Pendjari Biosphere Reserve in West Africa. The aim is to evaluate the potential of the Biosphere Reserve in ES supply facing biotic disturbances. A total of 112 respondents, including the riparian community and the Reserve officials were interviewed. First, we used ranking techniques based on stakeholders' preferences to underline the differences in perceived importance of ES. Second, we assessed the perceived impact of elephants on ES supply from both direction and intensity perspective. Third, the economic value of benefits from targeted ES was estimated using benefit-cost analysis; gross annual income for threatened ES, and losses incurred by households were also assessed. Twenty-seven ES were enumerated, 13 provisioning ES (PES), 12 cultural ES, and two from the regulating and maintenance ES category. PES were perceived as the most important although not significantly different from other categories. PES were also found to be most negatively affected by elephants' impacts. However, elephants' presence increased supply of cultural ES. The average cost of the losses due to elephants' damages ranged from \$174.80 to \$586.05 per year and per victim household. These results are discussed in the perspective of management action needs to resolve conflict between elephants and local populations.

Names and affiliations: Poonam H Dhanwatey (Tiger Research and Conservation Trust, Member of State Board for Wildlife, Maharashtra), Harshawardhan Dhanwatey (Tiger Research and Conservation Trust), Dr. Claudio Sillero Zubiri (WildCru, Oxford)

Title of presentation/panel/round table discussion: Human - large carnivore conflict - Mitigation through Education, participation and Eco-tourism

Format: Oral presentation

ABSTRACT: We examined 150 cases of attacks on humans by tigers and leopards in 2011-2018. These were compared to an earlier study of 132 carnivore attacks on humans (2005–2011) wherein 71 (54%) of which were lethal to humans. Tigers and leopards were responsible for 78% and 22% of attacks, respectively. Significantly more victims were attacked while collecting minor forest products than during other activities. Our results show that human activities near the Reserve needed to be regulated and limited as much as possible to reduce human mortality and other conflicts. It also indicated that increasing access to alternative fuel sources would reduce pressure on timber harvesting in protected areas. Training of residents in identifying carnivore sign and in ways to reduce their vulnerability when working outdoors would help.

Tadoba Andhari Tiger Reserve in the Chandrapur District of Central India has a core of 625 km² surrounded by an 1100 km² buffer zone. This buffer zone is an amalgamation of forest area, 92 villages with 16500 families and livestock sharing natural resources with more than 40 tigers and a plethora of other wildlife. For minimising the human – large carnivore conflict and facilitating the forced co-habitation of people and large carnivores in the forested buffer of Tadoba Andhari tiger reserve in the Chandrapur District of Central India, we have created leadership and participation of local communities in all 92 villages for this mitigation.

Names and affiliations: Riyaz Ahmed (Wildlife Trust of India), Sameer Khazar Dar (Wildlife Trust of India), Tahir Gazanfar (Wildlife Trust of India), Ifshan Deewan (Department of Wildlife Protection, J&K), Rahul Kaul (Wildlife Trust of India)

Title of presentation/panel/round table discussion: Conserving markhor through community participation and awareness

Format: Oral presentation

ABSTRACT: In India, markhor is found in Jammu and Kashmir only with Kazinag and Pirpanjal harbouring the last two viable populations. The Pirpanjal population is however facing the threat of local extinction with Hirpora population, the stronghold in Pirpanjal, reduced to half within a decade. Increasing livestock numbers, poaching, poor law enforcement, insurgency and emerging threats such as unwise development have been the major causes for the decline.

Wildlife Trust of India (WTI) in collaboration with Wildlife Protection Department (WLP) initiated conservation efforts to address some of these major threats markhor has been facing. We engaged with herder community and wildlife department to reduce the livestock numbers. WTI and WLP held consultations with the herders to ensure that non-traditional herding practices are controlled. To curb poaching, informer networks were set up in the vulnerable areas. WTI in collaboration with Botany Department of Kashmir University conducted a state level workshop with participation from media, civil society, Judiciary, academics, Wildlife Department, Social scientists, environmental activists and students to play their roles to conserve wildlife especially flagship species like markhor and their habitat from the blind development.

Wildlife and communities: searching for ethical solutions to conflict Part 3

Names and affiliations: Shweta Roy Choudhury, Design Accord (Delhi)

Title of presentation/panel/round table discussion: The Roaring Cats of India - An analysis of the impact of modern civilization and the subsequent management opportunities

Format: Oral presentation

ABSTRACT: The wild Indian forests are the home to five distinct "Roaring Cats" (genus Panthera) species, namely Asian lion, Royal Bengal tiger, Indian leopard, Snow leopard, and Clouded leopard. When it comes to animal conservation, their depleting figures in India are at the core of the minds of people. The scale of human population growth is radically inversely proportional to the numerical growth of large cats. This increasing demand for human space has caused enormous habitat degradation for large cats – one of the most admired and recognized animals, at the top of the food chain. Even today, wildlife is still the primary source of revenue for many in India's tropical forests, and this has eventually led to what we call "Empty Forest Syndrome," which has a direct impact on the well-being of large Indian cats. Along with the above, severe big cats poaching coupled with inadequate efforts by the public to maintain their species has also resulted in a dramatic contraction of their age spectrum.

The paper thus focuses on first understanding the present situation of large roaring cats across India and then evaluating the growing conflict between human and big cats in both ecological and socio-cultural contexts. Variables such as spatial and temporal research allocation, techniques used to study conflict, intervention assessment, and management suggestions are essential to examine. The ultimate aim at the end is to conserve the Panthera species and to attain an environment where humans and big cat species can coexist.

Names and affiliations: Navdeep Sood (Wildlife Ecologist)

Title of presentation/panel/round table discussion: Wildlife Adaptations and Human behavior in Urban Areas

Format: Oral presentation

ABSTRACT: The data on wildlife presence from urban areas, city areas and other non-forest regions is not very available. This data, if collected, can have a significant impact on decision making processes of conservation. Moreover the findings inside PAs (Protected Areas) cannot be generalized on the wildlife present outside PAs. While fast urbanization has degraded wild habitats, it seems few species have starting adapting to new urban areas. Humans are very slow in adapting to the presence of wildlife in their proximity but wildlife seems more adaptable in adopting to new urban habitats. In the future we may have the same species with different behavioral patterns for forest wildlife and for newly adapted urban wildlife. This optimistic approach has many unanswered questions about the sustainability and ecological usefulness of urban wildlife. An attempt has been made to collect evidence-based data on the presence of wildlife and the behavior of humans and wildlife in Tarn Taran district, a region among lowest forest cover areas in the state of Punjab. Punjab state itself has very low percentage of its GA under forests. It has also been observed that there is an urgent need for an awareness campaign for local level media people, esp. those operating only on Social Media, for better awareness among people living in areas which are not used to seeing wildlife. Training citizen conservationists in different regions is also the key for successful conservation.

Names and affiliations: Shibaji Charan Nayak (Wild Tiger Conservation Program), Monalisa Bhujabal (Wild Orissa)

Title of presentation/panel/round table discussion: An Unique Conservation Story of Waterfowl Conservation With Participation of Poachers and Hunters- Case Of Mangalajodi in Chilka Odisha

Format: Panel of speakers

If you propose a panel of speakers, please identify speakers and topics of presentation: Shibaji Charan Nayak and Monalisa Bhujabal

ABSTRACT: Chilika Lake, Ramsar Wetland, in the state of Orissa is unique for avi-faunal diversity. India has witnessed many approaches to wildlife conservation. In most cases in India there are government initiated measures at conserving India's natural heritage. An initiative to address the problem of poaching of waterfowl and restoring an ecosystem and conservation of bird breeding habitat, has been executed by Wild Orissa, since 1996. Understanding that involvement of poachers and hunters, who are a major stakeholder in illicit poaching and traffic and trade in wildlife, efforts were successfully made to ensure their participation in containing poaching of waterfowl in the Chilika Lake. Wild Orissa constituted a bird protection committee called the Sri Sri Mahavir Pakshi Surakshya Samiti in the year 2000. At the same time what was also critical was Wild Orissa, facilitated the involvement of Odisha Wildlife Department, Chilika Development Authority, Bombay Natural History Society, etc. This initiative with the participation of poachers and hunters is a model unique in its practice in India's conservation history. One of critical achievements in this conservation of wetlands and biodiversity is improvement of socio-economic conditions of local community. Rarely has a wildlife conservation model involving one time hunters been successful and that too sustained over a decade.

Names and affiliations: Sudhanwa Dash and Shibaji Charan Nayak (Wild Orissa)

Title of presentation/panel/round table discussion: A tryst with the fortunes in wildlife of Similipal - a path ahead amidst challenging times

Format: Oral presentation

ABSTRACT: Similipal is a blend of Western Ghat, Eastern Ghat and Sub-Himalayan species with 1076 flowering species and 96 species of orchids. Immediately after the left wing extremism strike during 2009, members of Wild Orissa visited the tiger reserve. The state police is now engaged on a needs basis in combating wildlife offences etc. There is a priority need to address these so as to ensure that biodiversity in the Similipal forests is sustained. In an effort to address these issues Wild Orissa engaged in some villages in Similipal during 2012 onwards. Effort was made to generate goodwill and also to provide platforms for interface between the major stakeholders viz. STR Administration and local communities, for which Wild Orissa carried out series of wildlife conservation programs in the said forest ranges in association with the Similipal Tiger Reserve. Competitions for school children from remotely located villages in the Similipal Tiger Reserve have been conducted. Rallies by school children for wildlife conservation and interactive sessions with local self-help groups and vana surakshya samitis have been carried out. Similipal Tiger Reserve (STR) provides a flow of benefits worth Rs. 160.30 billion per year (Rs. 0.59 million per hectare) and stock benefits of Rs. 498.33 billion per year. Main ecosystem services that arise from this tiger reserve include provisioning of water, water purification and climate regulation. The collective worth of ecosystem services having direct and indirect impact on human health was found to be Rs. 298.97 billion per year. The investment multiplier for STR was calculated as 3038.31. These initiatives have had positive fallout: improvement in presence of some wildlife, associating and inculcating wildlife conservation consciousness, positive communications operating between the major stakeholders, increase in active participation in wildlife programs, etc.

Wildlife and communities: searching for ethical solutions to conflict Part 4

Names and affiliations: Kishor Rithe (Satpuda Foundation)

Title of presentation/panel/round table discussion: Linear Development and Conservation-can they coexist?

Format: Oral presentation

ABSTRACT: India has recorded an increase in the tiger population from 2226 (2014) to 2967 in 2018. This happened although the human population annual growth in India is 1.02% and human density reached 416 people per square kilometer. As more human population growth and density occurs, both demands more infrastructure and development, poses several challenges for the forests and natural resources, including by the tiger population. The challenges includes accidental deaths of wild animals, casualties of humans and livestock in mainly carnivore attacks and significant losses to property including crop losses. As per the state of India's Environment Report in 2019, infrastructure projects like existing roads and railways alone accounted for 167 wild animal deaths of around 19 species. Elephants are mainly hit by trains whereas others including Asiatic Lions, Leopards and Tigers die in road and train accidents. As per the data shared by the Ministry of Environment, Forest and Climate Change (MoEF&CC), during 2015-16, 2016-17 and 2017-18, there are 49 elephant deaths in train accidents and 194 deaths of Leopards, 11 deaths of Tigers and five deaths of Asiatic Lions in road and train accidents. More than 1000 humans were also killed in wildlife attacks, indicating the intensity of human-wildlife conflict in India.

Three priority linear infrastructure sectors transport, power and irrigation, caused a significant negative impact on wildlife. We reviewed its present development scenario and how the concerned agencies oversee the safety and security of wildlife populations and their landscapes, in presence of legal and administrative framework. We have documented some of the preliminary preventive and mitigation measures adopted on transport and irrigation projects which shows the intensity and extent of Human-Wildlife conflict can be reduced by appropriate site specific measures based on scientific data and studies.

Names and affiliations: Himani Nautiyal (Kyoto University, Japan), Virendra Mathur (Indian Institute of Science Education and Research, Mohali), Anindya Sinha (National Institute of Advanced Studies, Indian Institute of Science Bangalore), Michael A Huffman (Kyoto University, Japan)

Title of presentation/panel/round table discussion: *Quercus* sp. as a potential mitigating factor for human-langur interactions in the Garhwal Himalayas: People's Perceptions and Ecological Importance

Format: Oral presentation

ABSTRACT: In the economically underdeveloped Garhwal Himalayas, a large population practice subsistence agriculture. The crop yield is poor, and thus there is an added dependence on livestock and forest resources. These forests are dominated by *Quercus* spp. which provides various ecological services to humans. The importance of *Quercus* spp. is also implicit in the ecology of Central Himalayan Langurs (*Semnopithecus schistaceus*), especially during winters. Increasing pressure on forest resources, stands to exacerbate competition for food in the forest and drive langurs to feed on agricultural crops. This study reports results from a survey of 215 households on the degree of human-langur interactions and the ecological importance of Banj oak. Response of villagers towards crop raiding by langurs and reduction in forest resources found less agricultural land, less agricultural production, and possession of large number of livestock significantly predicted villagers' reporting crop-raiding events, although economic status of the correspondents did not have any effect. Perceptions about reduction in forest resources was significantly affected by the amount of livestock possessed by the villagers. Banj Oak (*Quercus leucotrichophora*) was the dominant species in the pool of sleeping trees used by the langurs. Similarly, dense oak patches were also the preferred feeding patches. Thus, we suggest replanting of Oak trees and conservation of intact Oak patches, environmental education outreach, and empowerment of women in the community as potential mitigating factors to lessen the conflict between human and langurs.

Names and affiliations: Dr. Nilanjan Ghosh (WWF India and ORF India, Kolkata), Dr. Pranav Chanchani (WWF India), Mr. Mayukh Chatterjee (Wildlife Trust of India), Ms. Rupinder Bakshi (Duke University)

Title of presentation/panel/round table discussion: Human Wildlife Conflict: bearing the cost of wilderness

Format: Panel of speakers

ABSTRACT: Human Wildlife Conflict (HWC) has emerged as an area of serious concern for conservationists in recent years in India. The loss of livestock to carnivores, mainly tigers and leopards is not uncommon in certain areas. Elephants too are known to cause extensive damage to life and property across their range. It is believed that each year around 500 persons lose their lives in attacks by tigers and elephants, with above average figure of 523 in 2018 including 494 human fatalities caused by elephants alone. A very large number of farmers lose a significant portion of their crop to wild herbivores, so much so that in certain areas the extent of losses has led to the farmers abandoning agriculture altogether. Local communities living near wildlife habitats bear the brunt of this conflict and they have responded to conflicts in different ways which are largely determined by various factors such as the socio-cultural environment, the nature and extent of loss caused, the effectiveness of state responses in terms of compensation for the loss(es) and the presence and actions of civil society organizations including WWF India which have intervened with a mix of mitigation measures and compensation programmes. The panel discussion will look at various aspects of HWC, including economics, agriculture, social issues and governance mechanisms.

Wilderness & Society - the benefits of human engagement with nature: Panel: Wilderness therapy and mental health benefits of the wild: Practice and Philosophy

Names and affiliations: Ian McCallum (Wilderness Foundation – Africa)

Title of presentation/panel/round table discussion: REWILDING THE HUMAN IMAGINATION – Therapy and Self Examination in a time of Environmental Disintegration

Format: Oral presentation

ABSTRACT: The ecological crises of our time – climate instability, pollution, the loss of wild animals and the habitats that support them, is more than a reflection of the damage and threat to the natural environment. It is a crisis of human identity – the way we think, the way we behave, the way we see ourselves in relationship to the natural world. Human individuality has been wrongly equated to individualism. We have forgotten that we are part of a web of life ... that what we do to the web, we do to ourselves. The consequences are clear: we have become an increasingly detached, uncertain, lonely and anxious species – some of the very reasons we seek psychotherapeutic help. Our sanity is at stake. In this presentation I will outline the primary reasons why individuals seek psychological help and that ultimately, issues and questions of personal identity - Who am I? Where do I fit in the world? What has become of me? – are inevitable. I will propose that any resolution of the human contribution to the environmental predicament of our time, is going to be ineffective without a renewed sense of identity, that we be willing to be disturbed, to rewild our imagination, to look beyond anthropocentric self-help to the animals, to the biosphere, to the universe itself ... to the rediscovery and nurturing of an Ecological Self.

Names and affiliations: Nitin Das (Healing Forest), Sunil Chauhan (Healing Forest)

Title of presentation/panel/round table discussion: Helping forests heal. Helping people heal.

Format: Oral presentation

ABSTRACT: In the modern world our connection with nature is reducing drastically. Our hectic lives put a lot of pressure on our body and mind. Over 350 million people suffer from depression. Stress has been declared a global epidemic and is linked to the six leading causes of death. Chronic illness, anxiety, anger, loneliness are on the rise, especially amongst the youth. At the same time the health of forests around the world is suffering. We lose 13 million hectares of forests every year. A simple idea can help us address and reduce these problems. New research and ancient wisdom have uncovered multiple health benefits of nature on our body, mind and spirit. Governments of Japan and South Korea have invested millions of dollars in promoting the concept of forest bathing. Through this concept we can create communities around city forests and urban parks that can act as support groups for each other and also take on conservation related projects. With time this idea can easily become a source of livelihood for people living in remote areas near forests, by creating tourism linked to forest therapy. By showing people how human health is directly linked to the health of our environment we hope to spread some healing in a world that needs it urgently.

<https://gcc01.safelinks.protection.outlook.com/?url=www.healingforest.org&data=01%7C01%7C%7C608ab9a6a3a2432c214e08d6fb933715%7Ced5b36e701ee4ebc867ee03cfa0d4697%7C1&data=boVxTrrCwm2axUO2YU%2FNdw6zzrqwlkjhPX2huTyexEE%3D&reserved=0> ,

Wilderness & Society: the benefits of human engagement with nature: Measuring impact and research. Theory and practice of mental health practice/wilderness therapy

Names and affiliations: Jo Roberts (Wilderness Foundation UK)

Title of presentation/panel/round table discussion: Wilderness therapy and mental health benefits of the wild: A global collection of papers and experience

Format: Panel of speakers

ABSTRACT: Balancing the needs of people and nature? This panel will include a range of speakers from across the world to share best practice and outcomes of the practice of wilderness therapy, forest bathing, mindfulness, trauma therapy, and other activities to help people improve their resilience, coping mechanisms and mental wellbeing through contact with the natural world, with a particular emphasis on wilderness. The panel will also include a discussion on developing wellbeing focused advocacy for wilderness and wild places value and protection. We will explore and share research methodologies, and outcomes that demonstrate the need for protection of green and wild space as centres of survival for all species, with a focus on wellbeing. We will also include the need for cost/benefit analysis methods to show evidence of the efficacy of this approach/approaches to drive forward support for Nature Needs Half and other conservation of wilderness initiatives. The panel will serve to feed into a Social Benefits Forum that collates and shares information for the purposes of improving human wellbeing, whilst advocating for the protection of wild spaces.

Names and affiliations: Jo Roberts (CEO Wilderness Foundation UK), Mike Rogerson (University of Essex)

Title of presentation/panel/round table discussion: Natural Hospitals: Mental Health and Social Benefit research linked to wilderness experience.

Format: Oral presentation

ABSTRACT: This presentation is based on sharing 12 years of qualitative and quantitative research conducted as a partnership of Wilderness Foundation UK and University of Essex looking at the impact of nature-based and wilderness trails on the mental health, self-efficacy, mood change and resilience in youth at risk from semi urban and urban environments in two areas within the UK. The presentation will share methodology, challenges of capturing information, selection processes, analysis and how the outcomes and evaluation can help a longitudinal project flex and grow over time to be more fit for purpose. We will also explore how research can not only drive funding, but also help participants understand their own journey of personal change and self-efficacy.

Names and affiliations: ZHANG Yuqi (Tongji University, Shanghai, China), SHI Xianglei (Tongji University, Shanghai, China)

Title of presentation/panel/round table discussion: The Restorative Sensation Influence of Wilderness

Format: Oral presentation

ABSTRACT: Evidence suggests that nature has a certain restorative effect on mental health of residents, promoting people gradually reaching the cognitive benefits of four stages: fresh mind, directed attention recovery, peaceful mind and self-reflection. Studies on restorative sensation currently is mainly concentrated in urban environments, with less studies about restorative sensation in the wilderness. The premise of the formation of restorative perception is the comfortable visual experience, so this study explores the relationship between restorative feeling and visual landscape space. Through a review of the theories of visual landscape and restorative environment, the study proposes that the visual attraction mechanism of wilderness space is mainly bottom-up or stimulus-driven. According to the five existing restorative sensation dimensions, coherence, novelty, fascination, escape and compatibility, statistical methods are employed to obtain three dimensions of restorative psychological perception: ease, enchantment and detachment. Based on the spatial comfort index and quantitative analysis methods of spatial entities, the wilderness landscape is classified. Using the modified Restorative Components Scale (RCS) we measured psychological indicators of subjects for different types of wilderness. Combining interviews and questionnaires, the correlation research is carried out by statistical methods, so as to establish a visual restoration evaluation index system of the wilderness.

Names and affiliations: SUN Xiaohui (Beijing Forestry University), QI Yuting (Beijing Forestry University), SHEN Xiaomeng (Beijing Forestry University), Prof. HAO Peiyao (Beijing Forestry University)

Title of presentation/panel/round table discussion: Progress and development trend of the theory of nature education in the world in the past 20 years --- Bibliometric Analysis Based on Web of Science Database

Format: Oral presentation

ABSTRACT: The development of modern cities has reduced the “green space” of contemporary cities, hindering the opportunity for human beings to come into contact with nature anytime and anywhere. “Children's natural deficiency” has become a common phenomenon in the city and has aroused widespread concern from all walks of life. Natural education has begun to receive attention and develop rapidly.

Taking the literature of nature education from 2000 to 2019 in the Web of science database as the analysis object, the information visualization software CiteSpace is used for data mining, objectively showing the distribution of literature research countries and key disciplines, and extracting knowledge in the field through highly cited literature. Based on the co-occurrence analysis of key terminology, this research highlights the research hotspots. The research shows that: 1) The research on nature education has generally increased in recent years, reaching a peak of nearly 20 years in 2018, and decreasing in 2019. The United States has advantages in this research field obviously; 2) The literature in this research field mainly focuses on psychology, environment and other related disciplines; 3) Environmental science, ecological education, education research, etc. are hot research fields of nature education. The relationship between nature education and landscape architecture is also increasingly close; 4) In the past 20 years, the theoretical system of nature education has gradually developed and improved, and it has been integrated into more and more disciplines, and has formed close ties with it. This paper aims to provide a valuable reference for the application of nature education.

Shinrin Yoku - benefitting Wilderness, society and self

Names and affiliations: Tom Bezek (Gaia's Forest Therapy and Wellness Center)

Title of presentation/panel/round table discussion: Shinrin Yoku — Befitting Wilderness, Society, and Self

Format: Oral presentation

ABSTRACT: Almost half of the human planet lives in urban areas today. Most humans love what they know and many urban areas lack the opportunities to experience the Wild parts of Nature. Yet natural/wild spaces set aside in urban areas attract an abundance of visitors. These visitors are introduced to the "wild" and many develop a Love of the Outdoors. It has been estimated that up to 90% of many urban peoples' lives, especially children, are spent indoors, in transportation, or in front of a technology screen. We humans frequently love and support what we are familiar with. For the preservation of Wilderness and Society people need to get outside in nature at multiple levels according to what is available to them. Let Nature be our Therapist. Shinrin Yoku offers an unplugged, Mindful way to accomplish this. These Walks can be done in urban parks as well as all other sorts of wild areas. These Walks not only reduce stress, lower cortisol levels, improve creativity, and foster greater acceptance of diversity but they promote and educate people to the value of and need for Nature.

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Wilderness and Well-being: What is well-being?

Names and affiliations: Dr. Simon King (MBBCh LMCC Medical Doctor)

Title: Wilderness and Wellbeing

ABSTRACT: Today, delegates will often encounter the concept, 'Wellbeing', in scientific conservation papers and within the vision statements of organisations. 'Wellbeing' is increasingly an idea being deployed to explain the value of Wilderness. New approaches to conservation are explicitly placing human wellbeing as the central objective and some call for this to be the *raison d'être* for conservation itself. Today, wellbeing as an idea, is everywhere. We see wilderness proponents talk of the wellbeing benefits of time spent in wild lands, citing examples of psychological, physical or social health and wellbeing gains. Many depend on this rationale to support projects and seek funding. We have reached a point where it is not possible to discuss the idea of a wild earth without at some stage invoking wellbeing in some sense. Yet we observe that the scientific literature does not define 'wellbeing' leaving those that rely on it with only a superficial understanding of a construct that is deceptively complex. We propose that this is a significant weakness in the global wilderness advocacy movement. If wellbeing is central to the key arguments, if it is utilised to define core outcomes, then it needs to be better understood and defined. Mis-perceptions of what it is, risk mis-aligning entire projects. This is nowhere more evident than in the current, acrimonious debate between the utilitarian-value and intrinsic-value factions. Wellbeing is the exact concept creating the factions. We postulate that more rigorous understanding of wellbeing can be demonstrated to resolve this conflict. We further offer that wellbeing is completely harmonious with wilderness and indeed requires it. Therefore it is an exceptionally powerful construct to deploy, but only if wielded with expertise. We believe this is one of the most important, non-core ideas in nature conservation today. Which means there is value in developing cross-disciplinary partnerships with health professionals around local initiatives. In fact, this is a call articulated by the most substantial global health and biodiversity organisations on Earth. It is a vision that has ignited the 'Planetary Health' movement.

Wilderness and Well-being: how to build partnerships

Names and affiliations: Dr. Simon King (MBBCh LMCC Medical Doctor)

ABSTRACT: Today, delegates will often encounter the concept, 'Wellbeing', in scientific conservation papers and within the vision statements of organisations. 'Wellbeing' is increasingly an idea being deployed to explain the value of Wilderness. New approaches to conservation are explicitly placing human wellbeing as the central objective and some call for this to be the *raison d'être* for conservation itself. Today, wellbeing as an idea, is everywhere. We see wilderness proponents talk of the wellbeing benefits of time spent in wild lands, citing examples of psychological, physical or social health and wellbeing gains. Many depend on this rationale to support projects and seek funding. We have reached a point where it is not possible to discuss the idea of a wild earth without at some stage invoking wellbeing in some sense. Yet we observe that the scientific literature does not define 'wellbeing' leaving those that rely on it with only a superficial understanding of a construct that is deceptively complex. We propose that this is a significant weakness in the global wilderness advocacy movement. If wellbeing is central to the key arguments, if it is utilised to define core outcomes, then it needs to be better understood and defined. Mis-perceptions of what it is, risk mis-aligning entire projects. This is nowhere more evident than in the current, acrimonious debate between the utilitarian-value and intrinsic-value factions. Wellbeing is the exact concept creating the factions. We postulate that more rigorous understanding of wellbeing can be demonstrated to resolve this conflict. We further offer that wellbeing is completely harmonious with wilderness and indeed requires it. Therefore, it is an exceptionally powerful construct to deploy, but only if wielded with expertise. We believe this is one of the most important, non-core ideas in nature conservation today. Which means there is value in developing cross-disciplinary partnerships with health professionals around local initiatives. In fact, this is a call articulated by the most substantial global health and biodiversity organisations on Earth. It is a vision that has ignited the 'Planetary Health' movement.

Roundtable Discussion: Practical lessons from Wellbeing-guided projects

Session Moderator: Professor Peter Hobson (Wilderness Foundation UK) | What is Planetary Health and Human Health? | Wellbeing as a means of protecting the planet. | Discussion members to discuss their views on a Gaia approach to health and wellbeing with examples and thoughts on the future. | Interactive session with the audience

New tools and techniques for monitoring Wilderness quality

Names and affiliations: Vladimir Bocharnikov (Pacific Institute of Geography, Far Eastern Branch of the Russian Academy of Sciences)

Title of presentation/panel/round table discussion: Concepts and measures for maintaining Wilderness and landscape biodiversity in the Anthropocene

Format: Oral presentation

ABSTRACT: Wilderness is a term of everyday language with different culturally influenced meanings. Wilderness is largely perceived fundamentally as areas of untouched, or so-called "virgin," nature, which in ecological terms contains relatively undisturbed natural animal and plant populations. In areas where urban lifestyles dominate in Russia, there is reduced likelihood of daily interactions with nature, and increases in the necessity of intentionality to experience such interactions. We understand wilderness (*dikaya priroda*) as a largely undisturbed place (region, landscape) and subject to human recognition and legislative protection. Outgoing from this pragmatic point of view, we developed an index of wilderness for mapping and planning purposes in Russia. Roadless areas, settlements, industrial infrastructure and powerlines are important input parameters of this index. Small scale GIS maps of wilderness areas and their level of protection were created. Three large federal districts in the Asian part of Russia contain the majority of the remaining large areas of wilderness, consisting of undisturbed flora and fauna; a total of more than nine million square kilometers (54.6% of Russia). We emphasize the particular role of arctic and sub-arctic regions as wilderness and biodiverse ecosystems.

Names and affiliations: Mikhail Stishov (WWF Russia), Dmitry Gorshkov (WWF Russia), Vladimir Krever (WWF Russia)

Title of presentation/panel/round table discussion: How to calculate PAs' coverage - differences between IUCN and national approaches

Format: Oral presentation

ABSTRACT: This review is another attempt to establish a correspondence between the concept of protected areas in the definition of the International Union for Conservation of Nature - IUCN (IUCN) and their categories, on the one hand, and categories of protected areas in the Russian Federation, on the other hand, in order to bring the statistical indicators in Russia to a certain common world standard. In previous attempts there was an intention to put the whole categories established by the Russian legislation in accordance with IUCN categories of protected areas. Though in fact the various territories pertaining to one of the Russian categories may correspond to different IUCN categories. Therefore, some Russian categories were set according to two or three IUCN categories, but without the corresponding descriptions and characteristics, which could give an idea of what kinds of Russian categories correspond to the fullest to IUCN categories. Finally, such an analysis is usually limited to areas which have the status of protected areas in accordance with Russian legislation, which structure and system of categories have undergone some recent changes. This survey includes all protected areas and areas and zones with special conditions of use, which may play a role in the conservation of nature diversity and can potentially meet the IUCN definition of protected areas, corresponding to any of their categories, and as a result, undertakes an attempt to systematize the diversity of protected areas and zones with special conditions of use in the Russian Federation, which can also contribute to the conservation of natural diversity.

Names and affiliations: Jonathan Carruthers-Jones (University of Leeds, Leeds, UK), Adrien Guette (University of Quebec Ontario), Steve Carver (University of Leeds, Leeds, UK), Thierry Lefebvre (French Committee of IUCN, France), Daniel Vallauri (WWF France)

Title of presentation/panel/round table discussion: Mapping naturalness in France

Format: Oral presentation

ABSTRACT: Rapid biodiversity loss and increasing landscape fragmentation pose significant threats to the remaining areas of high wildness. Within Europe these small pockets of wildness are characterised by very low levels of human influence and a high degree of landscape intactness, where natural habitats remain. In order to protect these areas, and in support of the EU resolution on Wilderness, high-resolution maps are required which measure the naturalness of the landscape along a continuum scale. This presentation describes how such a map was constructed for the whole of mainland France using the best available datasets. We describe how a model was built to capture the two key attributes of wildness in the landscape, human influence and the naturalness of land cover. Anthropogenic influence on the landscape was derived from data on built infrastructure and night-time illumination. This was combined with data on vegetative land cover, reclassified based on expert consultation, to describe the naturalness of a given habitat type, adjusted by ecoregions. These layers were combined in a multi-criteria model with further data on the historical presence of woodland and the steepness of slopes to take account of the probability that vegetation has persisted over the long-term.

Names and affiliations: Manuel Schweiger (Frankfurt Zoological Society), Ulrich Stöcker (Deutsche Umwelthilfe- Environmental Action Germany)

Title of presentation/panel/round table discussion: Wilderness in Germany

Format: Oral presentation

ABSTRACT: On two percent of Germany's land area, nature should be allowed to take its course and unfold without human disturbance. This goal, which was set by the German government in the National Strategy on Biodiversity (2007), is quite ambitious for an industrial and highly fragmented country. Therefore, implementation is complicated and only half a percent of the German land surface was designated for wilderness development so far. A group of 18 nature conservation organizations, the first coalition of its kind in nature conservation, is working together towards more wilderness in Germany. All the major German nature conservation organizations and foundations are members of this alliance, which was initiated and continuously coordinated by Frankfurt Zoological Society. Through joint professional events and publications, the wilderness debate could be harmonized and directed effectively on the political level. The website wildnis-in-deutschland.de serves as the central platform, providing an image film, profiles of wilderness areas, current news and more. The partners of the alliance have contacted decision makers in order to win their approval of more wilderness protection in Germany. In addition, they launched communication channels and campaigns, and they initiated and supported regional, trans-regional and nationwide wilderness-related projects. The coalition also achieved success in terms of securing land area for wilderness protection. A big step is a wilderness fund that recently has been created by the German government, which will provide 10 million EUR per year to NGOs for the purpose of securing wilderness areas. The close and constructive cooperation of the NGOs among each other and with the German Federal Ministry of the Environment were fundamental for the success and can serve other initiatives in other countries as an example.

Inventorying and Monitoring Wilderness Sound Attributes

Names and affiliations: Sarika Khanwilkar, Vijay Ramesh and Pooja Choksi (Columbia University and Project Dhvani (co-founders))

Title of presentation/panel/round table discussion: Promises and pitfalls of bioacoustics

Format: Panel of speakers

If you propose a panel of speakers, please identify speakers and topics of presentation: Abhi Mandela, Robin Vijayan, Chiti Arvind, Zuzana Burivalova and Anand Osuri

ABSTRACT: Conservation Technology is the latest buzzword. Low-cost and novel technologies such as acoustics offers the potential for rapid and/or long-term monitoring of biodiversity. As a wilderness monitoring tool, acoustics holds great promise for wildlife and landscape conservation. However, using acoustic technology requires appropriate sampling methodologies, and most importantly, analysis and interpretation, which is critical for wildlife conservation. Soundscape ecology is a unique approach to study a landscape, which relies on acoustic data in place of more time-consuming and labour intensive methods to monitor biodiversity. Acoustics have been used for a range of studies that include characterizing the long-term impacts of human activity on biodiversity; the seasonal movements of migratory taxa; and the effects of vegetation structure on vocalizing biodiversity. In addition, acoustics can be used for species-specific identification and to identify where and when diversity is under threat. This panel discussion addresses the how, what, and why of acoustic monitoring for targeted research and impactful conservation, while recognizing the caution researchers and practitioners must exercise as data collection and analysis becomes increasingly automated. Some of the questions we will cover include: how much can and should we rely on acoustic data and inventories? In an ecological context, what do acoustic indices actually tell us? What are the latest advances in machine learning algorithms to be used for threat detection and immediate warning systems based on acoustics?

Names and affiliations: Jonathan Carruthers-Jones (University of Leeds, Leeds, UK), Alice Eldridge (University of Sussex, Falmer, East Sussex, UK), Patrice Guyot (IRIT, Université de Toulouse, CNRS, Toulouse, France), Christopher Hassall (University of Leeds, Leeds, UK), George Holmes (University of Leeds, Leeds, UK)

Title of presentation/panel/round table discussion: The call of the wild: Investigating the potential for ecoacoustic methods in mapping wilderness areas

Format: Oral presentation

ABSTRACT: The critical importance of wilderness areas (WAs) for biodiversity conservation and human well-being is well established yet mapping criterion on which WA management policies are based take neither into account. Current WA mapping methods are framed in terms of absence of anthropogenic influence and created using visual satellite data, obviating consideration of the ecological or anthropogenic value of WAs. In this paper we suggest that taking the acoustic environment into account could address this lacuna. Participatory walks, including *in situ* questionnaires and ecoacoustic surveys were carried out at points along transects traversing urban-wilderness gradients at four study sites. The relationships between a suite of six acoustic indices (AIs), wilderness classifications and human subjective ratings were examined. We observed significant differences between five out of six AIs tested across wilderness classes demonstrating significant differences in the soundscape across urban-wild gradients. Strong, significant correlations between AIs, wilderness classes and human perception of wilderness were observed, although magnitude and direction of correlations varied across sites. Finally, a compound acoustic index is shown to strongly predict mapped wilderness classes (up to 95% variance explained MSE 0.22); perceived wilderness and biodiversity are even more strongly predicted. An important next step is to ascertain the ecological and anthropogenic relevance of these differences and develop new automated acoustic analysis methods suited to mapping the environmental characteristics of WAs.

Names and affiliations: XU Xiaoqing (Tongji University, Shanghai, China), KONG Dejun (Kunming University, Kunming, Yunnan, China)

Title of presentation/panel/round table discussion: Mapping the Tourism Transportation Noise Exposure To Natural Quiet and predicting potential effects on the threatened Black-Necked Cranes in Dashanbao Protected Areas

Format: Oral presentation

ABSTRACT: The magnitude and distribution of anthropogenic noise have increased in the past century, causing potential threats to sound dependent animals, various ecosystems and human-beings, also. Soundscape-related indicators that reflect continuous and spatially diverse measures of natural quiet and human-caused noise can be difficult to measure directly.

By integrating natural soundscape and tourism transportation, we aimed to determine the noise affecting level, affecting areas and construct tourism noise map in Dashanbao protected area, Yunnan, SW China, where threatened Black-necked Cranes winter. Then by comparison analysis, research tried to understand the potential effects of tourism noise on crane communication through a playback experiment, e.g. the spectrum and spatial overlapping of tourism noise and crane calls, then we modelled soundscape of our study area under different tourism episodes to imitate future tourism increase and predicted its potential effects on this threatened species. According to research results, tourist management strategies will be applied on this wilderness protected area, such as the limitation of private cars in protected areas, the time spending of bird watching and length of stay by private transportation. The effects of potential management alternatives can be explored proactively before being deployed in a park or protected area. Specific indicators included percentage of groups' time spent in quiet, percentage of groups experiencing an arbitrary period of natural quiet, and distance/time required to reach natural quiet from any of the trailheads studied.

Mapping Wilderness Geographies

Names and affiliations: Steve Carver (University of Leeds), CAO Yue (Tsinghua University), YANG Rui (Tsinghua University)

Title of presentation/panel/round table discussion: Mapping the “Huāng-Yě Line”: Defining a wilderness geography for China Major

Format: Oral presentation

ABSTRACT: In 1934, Chinese geographer Hu Huanyong drew the "Aihui-Tengchong Line", which is now known internationally as the "Hu Line". This reveals one of China's most important characteristics of population distribution: The east is densely populated, while west is only sparsely inhabited. While the Hu Line is extremely important in understanding the spatial patterns of settlement in China it is perhaps better described by looking at patterns of wilderness and the associated east-west split along environmental lines. Using existing spatial models of wilderness quality, it is possible to draw a new line to better describe east-west divide in China resulting from these historic patterns of settlement and development and their underlying environmental drivers. Here, a wilderness quality index (WQI) derived from ongoing research by the authors is sliced using an equal area method to show the top 10%, 30% and 50% wildest areas across the whole country. The percentage of wildland area is calculated for each of the 2862 counties in China and a simple line is generated to separate those counties with more than 50% wildland by area from those less than 50%. In the areas to the west of this line there are still many large wilderness areas, while in the east any remaining wilderness areas are small, isolated and highly fragmented, so a Wilderness Line or “Huāng-Yě Line” can better be used to separate China into roughly two halves in terms of the patterns of wilderness mapped here.

Names and affiliations: Glenys Jones (Tasmania Parks and Wildlife Service, Department of Primary Industries, Parks, Water and Environment (DPIPWE), Tasmania, AUSTRALIA; Honorary Associate, University of Tasmania, Geography and Spatial Sciences, College of Sciences and Engineering, School of Technology, Environments and Design)

Title of presentation/panel/round table discussion: Monitoring wilderness quality in the Tasmanian Wilderness World Heritage Area

Format: Oral presentation

ABSTRACT: The Tasmanian Wilderness World Heritage Area (Australia) is one of the largest temperate wilderness areas in the world and is renowned for its beautiful, wild, remote landscapes and intact ecosystems. This presentation outlines the approaches the Tasmania Parks and Wildlife Service has developed for monitoring, evaluating and reporting on management effectiveness for the Tasmanian Wilderness. It shows how long-term monitoring and mapping of landscape wilderness quality is enabling the management agency to publicly report - with confidence and supporting evidence - that the mapped wilderness quality of the Tasmanian Wilderness has remained in very good, and generally stable, condition over the 20 year period for which data are available. Long-term monitoring and reporting on the condition and trends of key reserve values, including high quality wilderness, is vital to supporting sound evidence-based decision-making for effective protection and restoration management.

Names and affiliations: Brooke A Williams (School of Earth and Environmental Sciences, University of Queensland, St Lucia, Queensland, Australia; Wildlife Conservation Society, Global Conservation Program, New York, USA), Hedley S Grantham (Wildlife Conservation Society, Global Conservation Program, New York, USA), James E M Watson (School of Earth and Environmental Sciences, University of Queensland, St Lucia, Queensland, Australia; Wildlife Conservation Society, Global Conservation Program, New York, USA), Silvia J Alvarez (Wildlife Conservation Society, Colombia Program, Cali, Colombia), Jeremy S Simmonds (School of Earth and Environmental Sciences, University of Queensland, St Lucia, Queensland, Australia), Carlos A Rogéliz (The Nature Conservancy, Bogota, Colombia), Mayesse Da Silva (International Center for Tropical Agriculture, Valle del Cauca, Colombia), Germán Forero-Medina (Wildlife Conservation Society, Colombia Program, Cali, Colombia), Andrés Etter (Pontificia Universidad Javeriana Colombia), Jonathan Nogales (The Nature Conservancy, Bogota, Colombia), Tomas Walschburger (The Nature Conservancy, Bogota, Colombia), Glenn Hyman (International Center for Tropical Agriculture, Valle del Cauca, Colombia), Hawthorne L Beyer (Global Change Institute, University of Queensland, St Lucia, Queensland, Australia)

Title of presentation/panel/round table discussion: Minimising the loss of biodiversity and ecosystem services in a relatively intact landscape under risk of rapid agricultural development

Format: Oral presentation

ABSTRACT: As humanity's demand for resources continues to rise and productive arable lands become increasingly scarce, many of Earth's remaining intact regions are at heightened risk of destruction from agricultural development. In situations where agricultural expansion is inevitable, it is important to manage intact landscape transformation so that impacts on environmental values are minimised. Here, we present a novel, spatially explicit, land use planning framework that addresses the decision making needed to account for different, competing economic-environment objectives (agricultural production value, biodiversity conservation, ecosystem service retention) when land use change is inevitable within a relatively intact landscape. We apply our framework to the globally significant savannahs of the Orinoquia (Colombia), which in a post-conflict era is under agricultural development pressure. We show that while negative environmental impacts can be reduced through planning, the total area of land that is converted to agriculture is the principal driver of the loss of biodiversity and ecosystem services. We identify planning solutions that perform well across all objectives simultaneously, despite trade-offs among them.

Names and affiliations: Martin Hawes (Independent researcher), Grant Dixon (Independent researcher)

Title of presentation/panel/round table discussion: A remoteness-based approach to the design, management and monitoring of wilderness protected areas

Format: Oral presentation

ABSTRACT: Remoteness is a crucial component of the 'wilderness experience' and also enhances the ecological integrity of wilderness areas. Many existing definitions of wilderness areas require them to be large; however large size is not always a reliable indicator of remoteness. We demonstrate this using case studies of existing protected areas. We advocate the use of wilderness assessment methodologies that incorporate remoteness-based variables, such as variants of the methodology originally proposed by Lesslie and Maslen (1995), as a basis for inventorying wilderness and for designing protected areas for wilderness conservation. Such protected areas need to incorporate buffers to maintain the remoteness of the wilderness they contain. Where the intent is to protect and conserve wilderness values, protected areas (and/or internal management zoning) should be designed to optimise wilderness quality and be managed to maintain and enhance it. We discuss the implications of this approach, particularly with regard to the definition and management of IUCN Category 1b areas. We cite the example of high quality wilderness areas along the south coast of Tasmania (Australia), which are currently threatened by proposed tourism developments. Finally, we offer preliminary thoughts on the desirability and practicality of establishing clear, agreed performance indicators, targets and limits for monitoring and adaptively managing areas to maintain wilderness quality.

Workshop: Preservation of Wilderness Character Workshop

Names and affiliations: Roger Semler (National Park Service Chief of Wilderness Stewardship), Nancy Roeper (National Wilderness Coordinator U.S. Fish and Wildlife Service), Peter Mali (National Wilderness Program Manager U.S. Forest Service)

The Interagency Wilderness Steering Committee is formally organized committee that addresses and seeks solutions for wilderness stewardship issues affecting the National Wilderness Preservation System. The IWSC is comprised of the Wilderness Program Chiefs/Leads from the NPS, BLM, USF&WS and USFS, the Directors of the Arthur Carhart National Wilderness Training Center and Aldo Leopold Wilderness Research Institute, a representative from the NPS/NRSS Science Program, and a representative from USGS

Title of presentation/panel/round table discussion: PRESERVATION OF WILDERNESS CHARACTER WORKSHOP

Format: Panel of speakers

ABSTRACT: This session will provide an overview of America's interagency strategy to monitor trends in selected attributes of wilderness character in the National Wilderness Preservation System based on protocols established in *Keeping It Wild 2*. The workshop will include a short Power Point presentation that will include an overview of the legal mandate to preserve wilderness character pursuant to the Wilderness Act of 1964; an introduction to the interagency wilderness character inventory and monitoring strategy; and a description of the "Wilderness Fellows model" that enabled the work to be accomplished through a young adult career development program, while significantly reducing costs. This will be followed by break out groups that will rotate through five interactive stations to discuss each of the qualities of wilderness character, associated standardized indicators, commonly used measures, lessons learned from the past several years, and preliminary trends. Agency employees representing the four federal wilderness management agencies and the Interagency Wilderness Steering Committee will facilitate each group break out station in 12-minute increments. This workshop will highlight America's wilderness character inventory and monitoring strategy that could be used as a model for countries developing wilderness preservation related programs systems, and land classifications.

Mapping and conserving Earth's diminishing wilderness

Names and affiliations: The location and protection status of Earth's diminishing marine wilderness. - Kendall Jones (Wildlife Conservation Society) | Far away but far from safe: the fragile state of Earth's terrestrial wilderness. - Katharina-Victoria Perez (University of Queensland) | Lasting implications of intact forest loss for Earth's climate. - Sean L. Maxwell (University of Queensland) | Spatial requirements for conserving biodiversity and its future risk of conversion. - James R. Allan (University of Queensland)

Title of presentation/panel/round table discussion: Mapping and conserving Earth's diminishing wilderness

Format: Oral presentation

ABSTRACT: Wilderness areas hold an exceptional range of environmental and cultural values. They play a key role in regulating local climates, sequestering and storing large amounts of carbon and supporting many of the world's most culturally diverse – but politically and economically marginalised communities. Despite their importance, wilderness areas are being destroyed at an alarming rate and need urgent protection. In this session we explore key questions relevant to conserving wilderness in an era of rapid global change. We start with a global update on the current extent of wilderness for both the marine and terrestrial realms, the magnitude of recent wilderness loss, and a discussion on the theory of wilderness mapping from global to local scales. We then explore two mechanisms for protecting wilderness; first, we have a presentation on the carbon value of intact forests, which if conserved could deliver real and verified emission reductions under the UNFCCC Paris Agreement. Second, we have a presentation on the spatial requirements for safeguarding biodiversity and wilderness, and how this can inform areal coverage targets in the 2030 United Nations Strategic Plan for biodiversity. Finally, we have a presentation on big-picture wilderness conservation describing options to incorporate wilderness within multiple international policy frameworks, and how we can translate changes in global policy into effective local action to ensure wilderness survives the 21st century.

Defining and Protecting Wilderness in Extreme Latitudes

Names and affiliations: Boris Solovyev (WWF Russia), Irina Onufrenya (WWF Russia), Vassily Spiridonov (Shirshov Institute of Oceanology of Russian Academy of Sciences)

Title of presentation/panel/round table discussion: Multiscale systematic conservation planning as a tool to protect Russian Arctic Seas in the times of unprecedented change

Format: Oral presentation

ABSTRACT: The Russian Arctic Seas are among the least impacted marine ecosystems in the world. These ecosystems are among the most fragile and slow to recover. They experience change in an unprecedented scale as the Arctic has become a focus region for international political and economic development initiatives. The Arctic changes significantly due to climate change as well. WWF Russia developed multiscale networks of priority areas for conservation and monitoring in the Russian Arctic Seas using systematic conservation planning methodological approach. The networks were developed in three spatial scales. The pan-Arctic scale network design is focused on criteria and features having a global or a pan-arctic significance such as the Last Ice Area or the Arctic endemic species, IUCN Red list categories, and is based on units of a pan-arctic bioregionalisation and biogeographic schemes. The national scale network is focused on national conservational priorities, Red lists, and features that are unique for the Russian Arctic Seas, and is based on nationally developed regionalisation schemes. The regional network of priority areas for conservation uses much finer data and spatial units and prioritises specifics of the Pechora Sea (part of the Barents Sea). A hierarchy of conservation features encompassing biotopes, habitats and biogeographic units was developed as a part of a framework for multiscale conservation studies.

Names and affiliations: Steve Carver, (University of Leeds), Snæbjörn Guðmundsson (ÒFEIG), Sif Konradsdóttir (ÒFEIG)

Title of presentation/panel/round table discussion: Protecting the wild landscapes and rivers in Iceland's Strandir area

Format: Oral presentation

ABSTRACT: Mapping carried out for the 2013 EU/EEA Wilderness Register for Europe shows that around 43% of Europe's top 1% wildest areas are found in Iceland. Of these a significant proportion lies in the remote northwest within the Strandir area of the Westfjords Peninsula. This wilderness is currently under threat from a hydro power plant proposed for the Hvalá and Eyvindarfjarðará valleys of the Ófeigsfjörður region, an area noted for its wild rivers and numerous large and spectacular waterfalls. The power plant will involve the building of approximately 30km of new access roads, five dams and the flooding of three new reservoirs together with a 40km power transmission line in a corridor cutting across the eastern wild highlands of the Westfjords peninsula. While the building of the power plant and the loss of wilderness quality in the region may be viewed as an example of a "green-on-green" impact (where in this instance a renewable energy source is exploited at the irreversible loss of wilderness) the development is being driven by demand to supply electrical energy for the expansion of crypto-currency mining operations rather than powering homes and essential infrastructure and so can be questioned. Meanwhile, the development of robust and defensible definitions of wilderness in the Icelandic landscape are poorly developed and are, as yet, largely unrealised within Icelandic nature protection planning and policy. This makes the presentation of a water-tight case for protecting the Strandir wilderness difficult.

Names and affiliations: Luis R. Pertierra (Universidad Rey Juan Carlos, Spain), Kevin A. Hughes (British Antarctic Survey, Cambridge, United Kingdom), Javier Benayas (Universidad Autonoma de Madrid, Spain), Miguel Ángel Olalla-Tarraga (Universidad Rey Juan Carlos, Spain)

Title of presentation/panel/round table discussion: Spatial Mapping of Human Footprint across Antarctic: advances and new challenges ahead

Format: Oral presentation

ABSTRACT: Antarctica needs better footprint mapping to enable policy makers to deliver the high level of environmental protection agreed through the Antarctic Treaty System. The continent is undergoing substantial changes: the extent and intensity of scientific activity and tourism in Antarctica is growing rapidly, with a commensurate increase in human impacts, including pollution, wildlife disturbance, habitat destruction and the introduction of non-native species. The unique characteristics of Antarctica, including its multi-party governance under the Antarctic Treaty, a lack of permanent population or agriculture and the limitations on permitted activities, pose distinct challenges in determining human footprint. Finally, climate change, which has most affected the Antarctic Peninsula, will change the extent of sea ice cover and ice-free ground, the distribution of terrestrial biodiversity and almost every element of human activity. In Antarctica, footprint indicators have been described using many different terms relating to disturbance, building, contamination, non-native species, noise, visual impact, visitation, risk, carbon, ecology and human presence. However, a comprehensive quantification and integration of these different elements of footprint presents an on-going challenge, which may affect our capacity to conserve this vulnerable, if still largely pristine, continent. Recent work meticulously described the footprint of buildings and disturbed ground within Antarctica. However, to develop this work further, we advocate adoption of the existing globally recognised multidimensional concept of 'human footprint', which encompasses a systematic quantification of all spatial pressures from human activities (Venter et al. 2016). Mapping and publishing a dataset that provides a multidimensional quantification of the Antarctic human footprint has already been made, but more needs to be done.

Toward understanding inventory of important attributes in India and the World

Names and affiliations: Shuvendu Das (Wildlife Institute of India), Tapasya Thapa (Wildlife Institute of India), V.P. Uniyal (Wildlife Institute of India), S.K. Gupta (Wildlife Institute of India)

Title of presentation/panel/round table discussion: A Systematic Review on Diversity and Distribution of Odonates (Insecta:Odonata) in Indian Himalayan Region

Format: Oral presentation

ABSTRACT: This study aimed to identify the research gap in the Indian Himalayan region in terms of total covered area, species diversity, taxonomic, and phylogeographic/biogeographic shortfall. The study area consists of Bhagirathi River Basin (IHR~60,000 km²), Uttarakhand from Indus River System under biogeographic province 2B and Teesta River Basin (BRB~7,000 km²), Sikkim from Ganga-Brahmaputra River system under biogeographic province 1C and 2C. Methods include compilation and categorization of all the published research articles in Odonates; e.g. taxonomy, biogeography. Stratified random sampling was carried out in at least one river basin from each Himalayan river system within a range of 500m-4000m. MaxEnt software was used to predict through the Analytical Hierarchy Process (AHP) the distribution of selected Odonata species in the study area. Species have indeed been identified by aligning obtained sequence from our present study with previously deposited sequences in the Barcode Of Life Database (BOLD). The preliminary evaluation resulted in the listing of 142 study papers from the Indian Himalayan region, and substantially first scientific documentation was published in 1898 on Himalayan odonates. Our study comprises 87 species belonging to 45 genera and 12 families in BRB and 32 species belonging to 17 genera and 11 families from TRB. We identified four habitat-specific indicator species for BRB. Generation of barcode databases was obtained for the Indian Himalayan Region for 42 species from more than 110 samples. Our current study indicates that the distribution and diversity of Odonate species in IHR were understated and requires more systematic studies in this region.

Names and affiliations: Meenakshi Kumar (Department of Energy and Environment TERI School of Advanced Studies, New Delhi, India), Prof. Shaleen Singhal (Department of Energy and Environment, TERI School of Advanced Studies, New Delhi, India)

Title of presentation/panel/round table discussion: Measuring the Resource Efficiency of Urban Forest Areas in the National Capital Region of Delhi

Format: Oral presentation

ABSTRACT: The unsustainable consumption of forest resources and changes in forest land use patterns in cities adversely affects the resource efficiency of existing natural habitats. Progressive cities and city-regions are improving the resource efficiency of their existing land resources by implementing strategies for restoring degraded land and ecosystems. The Delhi National Capital Regional Plan 2021 identifies the urban forest network, the Aravalli network, as an ecological fragile zone and emphasizes the need to conserve the resource base. This paper maps the forest cover change to quantify the change in fragmentation in the urban areas in The National Capital Region of Delhi from 2002 to 2017 using satellite imagery. The paper investigates the impact of forest land restoration strategies on the resource efficiency of the urban forest network in the area of study using Data Envelopment Analysis (DEA) method. The input conditions for DEA are identified based on ecological and socio-economic attributes of natural resources. The analysis reveals that there is a weak relationship between increase in forest cover and level of fragmentation of urban forest areas. The paper discusses opportunities to increase the efficiency of existing forest resources in cities through strategies for land and ecosystem restoration. The paper raises the need to incorporate ecological parameters along with socio-economic parameters to increase the resource efficiency of urban forest networks in cities.

Names and affiliations: Dr Ramasubbu Raju (Department of Biology, The Gandhigram Rural Institute, Tamil Nadu, India)

Title of presentation/panel/round table discussion: Conservation approaches on two endemic and endangered Tree species (*Syzygium* spp.) of Western Ghats

Format: Oral presentation

ABSTRACT: *Syzygium* Gaert. is the largest genus of the family Myrtaceae, with 1,200 taxa and is distributed from Africa eastwards to the Hawaiian Islands and from India and southern China southwards to Australia and New Zealand. In India, *Syzygium* is represented by 71 species distributed in North-East and the Western Ghats. Of 52 species of *Syzygium* reported from Western Ghats, 19 were reported as endangered (IUCN, 2019-1). A field survey confirmed the limited distribution and rarity of several species of *Syzygium*. In general, this group consists of trees that are ecologically significant, providing nourishment to a wide array of forest biodiversity. The edible fruits and tender leaves and flowers are a seasonal food source for Lion tailed macaque, Nilgiry Langur, Great Malabar hornbil, Malabar Giant Squirrel, Great Indian Hornbil and several other birds. *Syzygium myhendrae* and *S. parameswaranii* are reported as endemic trees of Agasthyamalai Western Ghats of India and included under the endangered category (IUCN 2019-1). The recent survey on these species indicated that factors like over exploitation, pressure from exotic weeds, reproductive inefficiency, irregular phenological events, lower fruit productivity, higher fruit predation by exotic insects and lesser seedling establishment is forcing them to be eradicated from the wild. Therefore, it is crucial to conserve these trees for the food security of wildlife. Detailed field surveys and population assessments have to be undertaken. Large scale production of saplings, enrichment of existing population and establishment of newer populations are obligatory for the conservation of these trees. By enriching the population of these trees, foraging for wildlife can be improved.

Names and affiliations: Andrew Whitley (Wildlands & Society for Ecological Restoration), Zoë Brocklehurst (Wildlands & University of Stellenbosch)

Title of presentation/panel/round table discussion: Simple metrics to measure ecosystem change

Format: Oral presentation

ABSTRACT: The South African government has long recognised the need for restoration practices; for example, the two decade old Working for Water (WfW) project that clears invasive alien plants to improve water flow. Continuing with governmental support and the WfW framework of employing unskilled labour, both researchers and restoration practitioners would like to develop a monitoring and evaluation protocol to track landscape change. The protocol would necessarily be undertaken by relatively unskilled people with basic training, be repeatable across the country, and show results in a relatively short time period.

Technical aspects of mapping biodiversity and wilderness attributes

Names and affiliations: Larry Gorenflo (Dept. of Landscape Architecture Pennsylvania State University, University Park, PA)

Title of presentation/panel/round table discussion: Key Human Dimensions of High Biodiversity Wilderness Areas

Format: Oral presentation

ABSTRACT: High biodiversity wilderness areas are large regions dominated by intact natural habitat that contain much of Earth's remaining biological diversity. These regions—Amazonia, the Congo Forests, New Guinea, Miombo-Mopane Forests, and the North American Deserts—when defined, accounted for about 17% of the planet's vascular plant species and 8% of vertebrate species as endemics (found only in a single wilderness area). Characteristics included relatively low human impacts, with each maintaining minimally 70% of its original habitat and human population density less than 5 persons/km². These regions cover at least 10,000 km², thereby representing repositories of high biodiversity in vast expanses of natural habitat. In this presentation I use geographic information system technology to examine selected current human dimensions of each region. The paper begins by analyzing recent demographic and land cover data to update documentation of human impacts. It then explores three complementary characteristics to understand possible continued human impacts and possible conservation solutions in these high biodiversity regions: agricultural suitability, as a means of gauging the potential for future crop production in areas currently undisturbed; selected measures of human well-being, to understand the potential pressure for expanded development to improve human conditions; and geographic distribution of indigenous languages, to understand the potential for indigenous peoples to serve as allies in biodiversity conservation. Results indicate widely varying human dimensions for the five high biodiversity wilderness areas, though with conditions in all beginning to reduce opportunities for cost-effective, large-scale biodiversity conservation. The paper concludes by discussing approaches to help conserve biological and linguistic (cultural) diversity in these rich and irreplaceable examples of our planet's wilderness.

Names and affiliations: CAO Yue (Tsinghua University), Steve Carver (University of Leeds), YANG Rui (Tsinghua University)

Title of presentation/panel/round table discussion: Mapping Wilderness in China: Comparing and Integrating Boolean and WLC approaches

Format: Oral presentation

ABSTRACT: Wilderness protection is increasingly important in the era of the Sixth Extinction and the Anthropocene. Mapping environmental indicators along a continuum of human modification provides key information for wilderness protection. However, uncertainty may occur in identifying wilderness areas by reclassifying wilderness continuum maps. In this study, an approach integrating both Boolean overlay and Weighted Linear Combination (WLC) is used to identify discrete wilderness patches and evaluate their relative wilderness quality. This approach is applied to China with a resolution of 1 square kilometer. The wilderness patches are first identified using Boolean overlay with discrete thresholds for land use, distance from settlements and roads. A Wilderness Quality Index is then created using a WLC model by weighting and combining six wilderness quality indicators including biophysical naturalness, population density, remoteness from settlement, remoteness from roads/railways, settlement density and roads/railways density. An integrated wilderness map is then created by combining the results from the Boolean and WLC models. It is found that China is a highly wild country in parts, containing over 86,000 wilderness patches, with varying relative wilderness qualities, which covers approximately 42% of China's terrestrial area. About 77% of the existing wilderness patches are not covered by nature reserves, indicating the obvious conservation gaps of China's wilderness areas. The wilderness maps presented here could potentially support new wilderness protected area designation, connectivity conservation, and monitoring programs. This integrated approach of wilderness mapping is potentially useful for other countries in conducting their own wilderness inventories and developing wilderness conservation policies.

Names and affiliations: ZHAO Ye (Qingdao University of Technology)

Title of presentation/panel/round table discussion: Landscape Management and Conservation of Marine Protected Area Based on Seascape Character Assessment——A Case Study of Changdao Island Nature Reserve, China

Format: Oral presentation

ABSTRACT: By the end of 2016, there were 296 Marine Protected Areas of various types in China, covering a total area of 1.745 million hectares, accounting for 6.6 percent of the sea area under China's jurisdiction. Marine national parks are an important part of the national park system in China, especially for the management and conservation approach of marine ecosystems. Landscape character assessments (LCA) and seascape character assessments (SCA) are used as integrated tools to protect national heritage (e.g. national parks, protected areas etc.) in Europe during recent decades. The European Marine Policy Statement states that references to seascape should be taken as meaning landscapes with views of the coast or seas. Seascape can therefore be considered an umbrella term that covers both the visual resource, marine character, as well as their cultural value. Cultural ecosystem services mapping assessments should be pushed ahead as indispensable elements in the management and protection of marine landscapes.

This research therefore uses an integrated conservation approach to investigate 1) how to assess, map, and quantify cultural ecosystem services at the protected area level and 2) develop SCA by adding cultural ecosystem services as indicators within the case study of Changdao Island Nature Reserve (CINR). The mapping process selected 6 (Dis) service (wildness, aesthetic value, social relations, sense of place, recreation and ecotourism, cultural heritage values) as indicators for a cultural ecosystem services assessment. The seascape character assessment identifies a total of 11 marine character areas (MCAs) for CINR. Spatial information on cultural ecosystem services that incorporates the different perceptions of stakeholders provides a rich basis for the development of sustainable marine landscape management strategies.

Names and affiliations: MA Xiaofen (Dongbei University of Finance & Economics), WEN Ye (Southwest Forestry University)

Title of presentation/panel/round table discussion: Study on the spatial pattern of Wilderness in Yunnan Province and its ecological tourism model

Format: Poster presentation

ABSTRACT: With globalization of the economy, exchanges between China and the West are getting more frequent and the cooperation is getting closer and closer. Academic discussions and cultural exchanges are ways of promoting mutual understanding and learning from each other. The proposal of ecological civilization accords with the background of the actual situation of environmental destruction, economic development and spiritual construction in China. It has a similar environmental background and spiritual needs as proposed by the concept of wilderness. At the same time, with the globalization of the concept of wilderness, there is concern among our scholars.

However, the introduction of the concept is only the first step. The purpose is to use the theory for protection and utilization. This article uses the concept of wilderness to systematically summarize and sort wilderness in Yunnan. Based on existing policies and regulations such as division of the main functional areas, delineation of the ecological red line as the base, the protection and utilization of Yunnan wilderness, and the continuation of the development of ecotourism paradigm.

The main operation flow is to first sort out the concept of wilderness, and then the distribution of the spatial pattern of Yunnan wilderness and delineation of the level, and then classified and file, and then through each level of eco-tourism five aspects (consumer, donor, management Body, community and goal) to establish a template for the systematic implementation of the mode of operation, thus forming a paradigm of ecotourism that targets the wilderness to meet the dual needs of both man and nature.

Roundtable Discussion: Eastern Himalayan Naturenomics Discussion. creating livelihoods and equality while restoring nature

Names and affiliations: Joanna Dawson, Karishma Ahmed, and Saurav Malhotra (The Balipara Foundation)

Title: Eastern Himalayan Rural Futures: From Snowline to Sealine

ABSTRACT: From the snowline of Nepal & Bhutan to the sealine of Bangladesh, the Eastern Himalayas play a vital role in meeting the global vision for Nature Needs Half. Habitat restoration efforts across the region are instrumental as a long-term solution against the rapidly escalating environmental loss and destruction increasingly threatening this region's rich biodiversity. Through case studies and a panel discussion, this session will explore the multiple models for habitat restoration for conservation currently being pioneered across the Eastern Himalayas, as well as the future actions needed to restore habitats at scale.

Objectives:

Exchange case studies of habitat restoration across different areas in the Eastern Himalayas

Explore the role communities have to play in habitat restoration

Ascertain the most effective change pathways for habitat restoration in the region

Identify key challenges that have emerged in the region – and the solutions being pioneered to meet those challenges head on

Unearth the overlapping drivers of success across these different models

Create a consensus and an action plan for what comes next – how do we restore habitats at scale, in a way that ensures just outcomes for forest-fringe communities dependent on habitats & forests for livelihoods?

High latitude and high altitude wilderness protection: Workshop: Protecting Mountains: Where will the next Mountain Protected Areas come from?

Names and affiliations: Peter Jacobs Chair (IUCN WCPA Mountains Specialist Group)

Title of presentation: Protecting Mountains: Where will the next Mountain Protected Areas come from?

Format: Power point presentation followed by round table discussion and workshop

ABSTRACT: The world's system of protected areas includes many outstanding areas within the earth's mountainous landscape. Outside Antarctica, about 19% of Mountain Areas are protected globally; nevertheless significant mountain areas are not adequately protected. Facilitating the establishment of new mountain protected areas is a key aim of the IUCN WCPA Mountain Protected Areas Specialist Group. This however needs to take a strategic approach to ensure resources are targeting areas most in need of protection and where there is likely best value for investment. Key Biodiversity Areas (KBA) are defined as sites that contribute significantly to the global persistence of biodiversity. The identification of KBAs provides one means for determining spatially unprotected areas of importance for biodiversity within mountains. Of about 4000 KBA sites in mountains, 20% are completely protected, however, 1947 KBAs are only partially protected and 1176 KBAs are entirely unprotected. This session will present a decision support tool based initially on KBA's, that assists in identifying priority areas to advocate for area based protection or conservation. This work and the framework utilises and supports a number of IUCN and other global initiatives. The Framework also considers a range of governance options within IUCN Protected Area categories and governance approaches including OECM's and ICCA's Territories for Life. The decision tool is primarily aimed at global assessment but may be able to support in country governments and organisations determine adequacy of Mountain Protected Areas. The application of the tool begins at the strategic assessment level but critically relies on regional onground assessments ensure accurate ground truthing.

Symposium on Science & Stewardship to Protect & Sustain Wilderness Values: Poster Session

Names and affiliations: Ebtisamul Zannat Mim (Research Associate, Nature Conservation Society, Bangladesh), Md Golam Rabbi (Wildlife & Biodiversity Conservation Officer, Bangladesh Forest Department)

Title of presentation/panel/round table discussion: Ecotourism Facility and Conservation Perspectives of Boga Lake by Indigenous Community

Format: Poster presentation

ABSTRACT: Boga Lake is the highest mesmerizing natural beauty of Bangladesh, 2700 feet above sea level. It is a 2000 years old hill-enclosed natural lake covering a total 15 acres of land. The lake is an average 38m deep and the deepest part is Bagachara-153m. The area is rich in biodiversity, especially plant diversity. But due to the acidity, there is no immediate vegetation on its banks and no fish was recorded yet. There are small indigenous communities: the Bawm, Tripura and Khumi located around the lake. Along with the original inhabitants, Marma and Murong indigenous communities are also noticed on the way or juxtapose to the lake. The way to the lake is by local bus, followed by Chander Gari and walking through the zigzag hilly pathway. Tourists can hire local tour guides. Tourists have to register their details in the Army security camp. Only 20 cottages with TK. 100.00 per person charge is the only way to stay in the lakeside area. Food is also arranged by the cottages, mostly traditional Bengali or community special menu. Due to excessive tourist pressure the lake biodiversity is under threat. A participatory conservation plan, Village Development Society (VDS), can be suggested to ameliorate the condition of this charming and adventurous lake. This plan will integrate by community participation, management committee, visitor's support and community development. Besides the beliefs and norms of the indigenous community, VDS will help to protect and enrich the biodiversity and boost the conservation of this heavenly place of beauty.

Names and affiliations: ZHU Ling (Shenyang Jianzhu University), WANG Rui (Shenyang Jianzhu University)

Title of presentation/panel/round table discussion: Nature-based Solutions: An Ecological Planting Model to Combat Desertification in Arid Grasslands of China

Format: Poster presentation

ABSTRACT: This paper aims to explore a low-maintenance, low-cost and sustainable ecological planting mode to deal with desertification of arid grasslands and restore ecological resilience. Starting from the theory of urban quasi-natural landscape design and the practice of ecological planting design, research takes "quasi-natural plant community construction" as the direction to explore the ecological planting strategy of arid grassland communities and fill the gap in the technology of artificial planting of arid grassland vegetation in China. Methods: (1) Literature review: the research progress and development trend of artificial planting of arid grassland vegetation were summarized. (2) Interdisciplinary application: based on the theory of ecological science and guided by the aesthetic design of plant configuration, the transformation relationship between theory and application is established through the connection of local plants. (3) Case analysis: the classic cases of artificial grassland plant communities at home and abroad were analyzed, and the native habitat construction methods and key control technologies were studied. (4) Field survey: investigate the structure, plant species and dynamic evolution characteristics of herbaceous community in the native habitat, and select the plant species and structure composition of the proposed artificial herbaceous community from the original habitat. Research contents : (1) We try to close forests and ban grazing, take wild seed collection, production, planting and management as a new way of residents' income, and provide sustainable services for ecological planting of grassland vegetation communities. (2) We plan ecological planting demonstration areas through GIS and other digital technologies to establish a safe landscape ecological network. (3) We interpret the original habitat and make use of the nature itself, establish the plant species of the established group through the sample survey of grassland communities of similar habitats, and conduct the introduction and cultivation experiment of native habitat herbaceous plants in the corresponding demonstration area. (4) According to the principle of CSR stratified planting, the vegetation structure of natural grassland communities is simulated, native vegetation populations with different gradients are established, community stability is observed, and the function of wind prevention and sand fixation of each gradient plant community is discussed.

Names and affiliations: WU Liang (Landscape Architecture, Southwest Forestry University, Yunnan Province in China), SU Xiaoyi (Southwest Forestry University, Yunnan Province in China), CAO Dong (Yunnan Normal University College of Arts and Sciences)

Title of presentation/panel/round table discussion: Study on the coordination of the planning system of natural protection land and wilderness continuum

Format: Poster presentation

ABSTRACT: This presentation studies the coordination of different levels of planning and wilderness continuum with different precision, and puts forward the theoretical framework of coordination. With the help of GIS technology, using remoteness and visualization models, four indexes such as the remoteness from settlements, remoteness from access, and biophysical naturalness as well as the apparent naturalness of the landscape, the domain wilderness degree continuous spectrum index map of Yunnan province was generated. The spatial distribution and hierarchical structure of the national system planning of protected areas and the national wilderness continuous spectrum overlay map were studied in collaboration. Provincial natural reserve system planning and national park, national nature reserve of national scenic areas such as geographical units with high precision index continuous spectrum or local provincial wilderness continuous spectrum fold figure, collaborative research reserve unit partition the protection classification of overall planning of reserve units with touring planning detailed planning control elements, etc. Set up reserve planning and continuous wilderness synergy theory framework, to achieve reduce the subjectivity in the planning and promotion objective things influence on planning and strengthen the protection goal.

Names and affiliations: Peter B. Wilson

Title of presentation/panel/round table discussion: Size Does Matter; Quotas Kill

Format: Poster presentation

ABSTRACT: Sustainability of fisheries and forests requires restraint based on size, not quantity. For most fisheries, this means an absolute size-limit. For logging, relative size suffices. Sustainability is typically offered up as a quantity, or quota, often dignified with an equation. A quota, however, results in the largest members of that species being selectively taken. The result is that survival-of-the-fittest is turned on its head. Instead, the smallest fish—those least fit; least able to feed themselves—survive. Winners are categorically removed from the gene-pool. This system of killing-off success is a recipe for fishery collapse. And it works with brutal efficiency. Sustainability requires restraint based on size, not quantity. A size-limit means fish over a specified size/weight cannot be caught. A size-limit restores evolution's most important principle: survival-of-the-fittest. More to the point, a size-limit maximizes yield in the long run, because the fittest fish survive, passing their genes on to the next generation. Size-limits also provide a market mechanism for enforcement. Using a quota, say, 5,200 tons, the buyer has no means of verifying that fish being offered for sale were taken under said quota. Using a size limit, e.g. 3 kilos, then all fish under 3 kilos are clearly legal. As with fisheries, sustainable forestry means leaving the largest, "fittest" trees: Free-standing trees should not be cut; if two trees are touching above ground, the smaller of the two may be cut.

Names and affiliations: Alison Swain (Invasive Species Council, Victoria, Australia)

Title of presentation/panel/round table discussion: Reclaim Kosci builds an urgent campaign in response to laws allowing an overpopulation of feral horses to damage Australia's Kosciuszko National Park.

Format: Poster presentation

ABSTRACT: Habitat destruction is identified as one of the greatest causes of biodiversity loss on the Australian continent. In Kosciuszko National Park (KNP), NSW's largest and best known park and a National Heritage listed property, introduced animals such as feral horses are vectors for habitat destruction, creating erosion, damaging waterways and introducing weeds. Out-of-control feral horse numbers are directly and indirectly threatening alpine and subalpine endemic species found nowhere else in the world. The headwater catchments and wetland springs that feed our mightiest rivers, the Murray, Murrumbidgee and Snowy Rivers are being degraded. The NSW Government passed an environmentally destructive law in 2018 that allowed feral horse populations within KNP. A public backlash followed and the Reclaim Kosci campaign was created in response. Other actions have included a 560km protest walk, a 12,300 signature petition handed into the NSW government calling for a repeal of the act, the mobilisation of scientists and a special feral horse impact conference at the Australian Academy of Science and an Aboriginal ceremony. This paper discusses the Reclaim Kosci campaign to protect the conservation values of KNP and repeal the 2018 legislation, and the desperate need to restore its heavily damaged catchments as soon as possible.

Names and affiliations: David Strayer (University of Utah), Sara Lotemplio (University of Utah), Amy McDonnell (University of Utah), Spencer Castro (University of Utah), David McNay (University of Utah), Kevin Greenberg (University of Utah)

Title of presentation/panel/round table discussion: Neurophysiological Benefits of Prolonged Nature Exposure

Format: Poster presentation

ABSTRACT: Although urbanization and advancements in technology have many benefits, it is important to understand how these rapid changes affect the individual. In modern (Western) lifestyle, people are increasingly spending less time outdoors and more time interacting with technology, which can have depleting effects on levels of attention (Frey, Benesch, & Stutzer, 2007; Klepeis et al., 2001). Attention Restoration Theory (ART; Kaplan, 1995) suggests that exposure to natural environments can restore directed attention. While a number of studies have supported the cognitive benefits of nature, few studies have examined the neural biomarkers of attention restoration. Specifically, we were interested in whether exposure to nature changes the amplitude of the P3b component, a widely studied event-related potential that occurs during updating of working memory in the brain. Higher amplitudes of the P3b component are thought to reflect greater allocation of attentional resources towards this updating process (Comerchero & Polich, 1999; Polich, 2007). The present study used electroencephalography (EEG) to measure brain wave activity in 41 participants before, during, and after a five day nature trip. Results found a significant increase in P3b amplitude following the trip, suggesting increased attentional capacity after prolonged exposure to nature. Consistent with previous research (Beil & Hanes, 2013; Beute & de Kort, 2014; Bratman et al., 2015; Roe et al., 2013), results also showed a decrease in self-reported stress and improvement in self-reported mood during the trip. This study provides accumulating evidence to highlight the importance of nature to individual well-being and cognitive functioning. On a broader level, this research supports the need for natural spaces in our physical environment, with the goal of preserving these spaces and making them more accessible to individuals as our world becomes increasingly urban.

Names and affiliations: David Strayer (University of Utah)

Title of presentation/panel/round table discussion: Neural Biomarker for the Nature Effect

Format: Poster presentation

ABSTRACT: We live at a time when policy change is largely influenced by empirical evidence. In order for wilderness to be protected, we are in dire need of data supporting the positive role of nature on both physical and mental health. Research surrounding the so-called 'nature effect' has historically been built upon psychological changes in nature. However, a gap in the literature exists on the effect that nature has on the brain. Therefore, the present study used electroencephalography (EEG) to identify a neurological biomarker of the 'nature effect' through observed changes in the electrical activity of the brain when an individual is immersed in nature. In particular, we observed changes in reward positivity (RewP), which is an event-related potential (ERP) component involved in reward processing and is influenced by the mesocorticolimbic dopamine system (Carlson, Foti, Mujica - Parodi, Harmon - Jones, & Hajcak, 2011; Foti, Weinberg, Dien, & Hajcak, 2011). Literature also suggests the amplitude of reward positivity might be a biomarker for depression (Proudfit, 2012). Furthermore, the RewP is generated in the anterior cingulate cortex (ACC), a region of the brain hypothesized to contribute to the restoration of attention that is theorized to occur in nature (LoTempio et al., in prep; Kaplan, 1995). To explore changes in the RewP in nature, participants completed three testing sessions—once in an urban environment, the next on a 5-day camping trip, and the last back in the urban environment. At each session, brain activity was recorded while the participant completed a gambling task designed to elicit the RewP. Results showed a decrease in the RewP in nature compared to before nature. These results suggest a down-regulation of the ACC when immersed in nature, which could be indicative of attention restoration, as theorized in the literature.

Names and affiliations: Jujjuri Srilekha (M.Sc student, Osmania University)

Title of presentation/panel/round table discussion: Butterflies in urban cities

Format: Poster presentation

ABSTRACT: Butterflies are beautiful insects which belong to Phylum Arthropoda, Class Insecta and Order Lepidoptera physically. But, scientifically in our environment they are one of the most important assemblages of insects that act as biodiversity indicators as well as nature's gardeners. Butterflies are considered as charismatic species for conservation planning as well as environmental monitoring and management. The environment in the urban cities is full of pollution today. People move to urban cities or developing cities for work, education, tourism, trading, business, and roam in vehicles which cause pollution. They even live in these conditions and make the environment polluted. Butterflies are very sensitive organisms. Are these conditions favorable to butterflies for their survival? No. So some conservation methods, awareness programs has to be followed by us. Some ideas like plantations, vertical gardening in apartments, seasonal surveying, and constructing butterfly parks could help in restoring our own species and maintain this world's glory.

Names and affiliations: Sibasish Sahoo (M.Sc. Wildlife and Biodiversity Conservation, North Orissa University)

Title of presentation/panel/round table discussion: Assessment of Human-black bear conflict in the District of North Sikkim

Format: Poster presentation

ABSTRACT: This study was carried out to understand the extent of Human-Asiatic black bear conflict, socio-economic condition and perception of local communities towards Asiatic black bear and Human-bear conflict in North Sikkim. A total of 137 individuals from different households were interviewed from 25 villages. Of all respondents, 61% of respondents were solely dependent on agriculture as a source of livelihood. 30% were illiterate whereas 7% were graduate. A total of 1071 livestock are reported from all the sampled households, from which cattle formed the highest (40.9%) proportion. 24 households reported 63 (45%) livestock loss due to depredation by carnivores with an average of 2.6 (± 0.5) per household. The average economic loss for livestock loss per household due to black bear was Rs. 14,708. 47% had dogs as pets. A total of 11 attacks of black bears on humans occurred between August and September and all were diurnal i.e. from 6:00 a.m. to 6:00 p.m. A total of 303 livestock depredations were recorded from 127 households in North Sikkim. Goats (77%) were the most killed livestock by black bear followed by cattle (20%). 90% of attacks on livestock occurred during the night. Almost every household reported maize depredation (92%) and (7%) cardamom. From July to September highest (81%) crop depredation events were reported. The majority of respondents (64%) disliked bears. Even though black bears cause significant loss to locals' property and threatens their lives, the majority of respondents stated it feels good to live with wildlife. Among several management recommendations more people suggest using preventive methods, such as fencing and financial compensation, as the most effective solution for reducing human-bear conflict.

Names and affiliations: Sristy Saha (Student, University of Dhaka), Ebtisamul Zannat Mim (Research Associate, Nature Conservation Society)

Title of presentation/panel/round table discussion: Molecular analysis of 16S ribosomal RNA gene of economically important marine Bombay duck and ribbon fish from Bay of Bengal

Format: Poster presentation

ABSTRACT: Combining morphological and molecular techniques was used to identify and analyse commercially important marine Bombay duck and ribbon fish from Bay of Bengal. To reiterate the need of management, the species composition of these fish was investigated which were collected from Cox's Bazar, Sundarban and Dhaka fish market. For molecular identification, mitochondrial DNA (mt DNA) was isolated using CTAB extraction protocol and PCR amplification of 16S rRNA gene was obtained for further analysis. Morphological identification was supported by molecular data generated by BLAST search result. The nucleotide sequence of Bombay duck (*Harpadon nehereus*) was 586bp and the G+C content was 51%. In case of ribbon fish, the sequence of (*Eupleurogrammus muticus*, *Eupleurogrammus* sp.) were 530bp, 532bp long respectively and the G+C content were 45%, 50% respectively. Further resolution was done by analyses of genetic diversity, polymorphism and phylogenetic tree construction. These observed fish species showed large genetic distance among each other. The genetic distance within species of Bombay duck fish (0.76) and ribbon fish (0.271 and 0.014) was observed. According to the polymorphic sites analysis, the intra species polymorphism of Bombay duck (*H. nehereus*) was 0.5% whereas inter species polymorphic sites analysis, 4.9% polymorphism was observed when *H. nehereus* and *H. microchir* were compared. Furthermore, the intra species polymorphism of ribbon fish (*E. muticus*) was 0.9% and the inter species polymorphic sites was 18.8% when compared with *E. muticus* and *Eupleurogrammus* sp. Phylogenetic tree construction, in case of Bombay duck, both the *Harpadon* spp. formed monophyletic clade. On the other hand, the unidentified species of ribbon fish *Eupleurogrammus* sp. formed monophyletic clade with *E. muticus*.

Names and affiliations: Taea Romagnuolo, Douglas MacMillan

Title of presentation/panel/round table discussion: Leopards in the Pink City: Human-Leopard relationships in Jaipur

Format: Poster presentation

ABSTRACT: Approximately 50 Indian leopards (*Panthera pardus fusca*) are known to exist in extreme proximity with human settlements in Jaipur. From the perspective of local communities, through surveys and interviews, this study aimed to gather information on neutral, positive and negative interactions, as well as assess attitudes towards leopards and gather perceptions on mitigation measures. Results showed multi-layered relationships and a high tolerance towards leopards, with Jaipur offering an example of ongoing human-carnivore coexistence. There were frequent neutral interactions reported, in addition to high numbers of negative interactions, mainly livestock attacks. Attitudes depended on types of interactions experienced, amount of livestock losses, knowledge about the leopard's role in the ecosystem and safety fears. Almost all respondents adamantly disagreed with harming leopards, demonstrating a high level of respect for the species. Current mitigation implemented was predominantly concrete enclosures and mesh fences, however there was a shift in focus towards other issues severely affecting well-being alongside leopard issues. For example, strained relations with authorities, drought, infrastructure and access to education and healthcare facilities. Regarding future mitigation, preferences for a strong boundary wall surrounding villages, to prevent leopards entering, was evident. As a non-lethal measure, this is indicative of the 'no harm' attitude present. An increase in wild prey is necessary, as well as increased community involvement in conservation decisions and increased protection measures in high conflict areas. However, there are no simple solutions and a holistic approach to investigating complex human-carnivore interactions is encouraged, with future research incorporating qualitative and inductive methods.

Names and affiliations: Angel Daen Morales Garcia (Biofutura A.C. & IUCN WCEL-WCPA-CEESP member, CoalitionWILD), Jonatan Job Morales Garcia (Biofutura A.C.), Maria B. Lambros Moreno (Biofutura A.C.), Karen Y. Juárez Valdez (Biofutura A.C.)

Title of presentation/panel/round table discussion: Strategic analysis of mechanisms for justiciability of the environmental rights and non-human wild animals rights in Mexico

Format: Poster presentation

ABSTRACT: We present in this research a documentary, bibliographic and jurimetrics analysis of legal and political instruments that address the rights of wild animals, as well as the application of the prospective method called MICMAC, and the development of an econometric model with simulation, to predict future events that will emerge if there are no changes in the relationship between humans and the others animals. This model in turn, will have the validity to be replicated in other developing countries, so it is an instrument that will lay the foundation for a change in the rights of wild animals. Also, along with the other strategies generated from the proposed analysis, it will serve as support for defense organizations for a more effectively fight the justiciability of the rights of wild animals.

Names and affiliations: Jonatan Job Morales Garcia, Daen Morales Garcia (BioFutura AC. México)

Title of presentation/panel/round table discussion: Environmental Education Workshops In Mexico: An Essential Tool For Biodiversity Conservation

Format: Poster presentation

ABSTRACT: One of the most useful tools in biodiversity conservation is education through a model that allows all social sectors to be recognized as an engine of change under the precept of educating to transform our conservation education model. It helps us to build solid links between human societies and animals with which we coexist by appropriating expressions and values for the conservation of nature.

This work is a formal, non-formal and informal education program for the conservation of assertive biodiversity, which allows the participation of all sectors of society, generating a change in the persecution and understanding of the importance of biodiversity on the planet.

Names and affiliations: Sara LoTempio (University of Utah), Emily Scott (University of Utah), Amy McDonnell (University of Utah), Rachel Hopman (Northeastern University), Spencer Castro (University of Utah), David McNay (University of Utah), Ty McKinney (University of Utah), Kevin Greenberg (University of Utah), David Strayer (University of Utah)

Title of presentation/panel/round table discussion: Nature as a Modulator of the Error-Related Negativity

Format: Poster presentation

ABSTRACT: According to Kaplan's Theory of Attention Restoration, spending time in a natural environment can restore depleted cognitive resources, specifically attentional resources, by giving the executive attentional network a chance to rest and recuperate. If this is true, then we would expect to see changes in the brain following nature exposure. Specifically, we might expect that nature could influence the brain's Error-Related Negativity (ERN) component of the Event-Related Potential (ERP). This component is reflective of the brain's error-processing system, which is part of the executive attentional network. Therefore, we should expect a decrease in ERN amplitude if the attentional network is at rest during nature exposure. We used electroencephalography (EEG) to measure participants' brain waves while they were on a camping trip to assess this claim. Here we do indeed report a significant decrease in ERN amplitude when participants are tested outside in nature on a multi-day camping trip, compared to testing before or after the trip in the lab. We also report plans for a second study, to establish replicability of the effect that nature reduces the size of the ERN.

Names and affiliations: LI Junfang, CHENG Zhibin, ZHONG Zhenyu, MENG Yuping, WANG Libin, BAI Jiade, LIU Yanju (Beijing Milu Ecological Research Center, Beijing China)

Title of presentation/panel/round table discussion: Analysis and suggestion on the problems of Père David's Deer protection in China

Format: Poster presentation

ABSTRACT: From prosperity to local extinction, from reintroduction to having steady wild population, the conservation of Milu in China is recognized by the world. IUCN determined that reintroduction of Milu was one of the 15 successful reintroduction projects among 138 projects in the world, and also the most successful one in China. Also, the experience from Milu provided a useful example for migration protection of wildlife in China. Major problems: lack of special national protection plan for Père David's Deer and wildlife; lack of control of breeding mechanism of Père David's Deer population; lack of standards and specifications in Père David's Deer population management; lack of information platform for monitoring Père David's Deer; lack of recognition of genetic development potential for Père David's Deer; Lack of unified scientific research management and scientific utilization for Père David's Deer; the ecological compensation problems caused by the conflict between human and Père David's Deer. Suggestions: we propose sustainable development: to enlarge and protect wild populations by releasing individuals into the wild; to establish national parks for Père David's Deer protection; to strengthen public awareness education about Père David's Deer and biodiversity; to make standards and specifications for Père David's Deer population management and human intervention policy on sustainable use for Père David's Deer under the guideline of national policies; to setup a funding system to solve the problem of ecological compensation in the case of human-deer conflict; to Strengthen International Cooperation to Achieve Transnational Exchange of Gene Resources between Père David's Deer individuals

Names and affiliations: Stuart Mellor, N.Salazar (University of Leeds)

Title of presentation/panel/round table discussion: Phragma

Format: Poster presentation

ABSTRACT: In a period of uncertainty around the future of our planet's wild ecosystems, it is essential to sensitise and inform public opinion on the kind of relationship between human and non-human entities that might guarantee a sustainable future for Earth. In particular, it has become necessary to recognise life outside the human framework, not least in terms of raising consciousness of the agency, the value and the rights of non-human entities. It is in this context that we propose a distinct interdisciplinary methodology for the biographing of rivers as living entities. The proposed research is framed within a growing international call for the declaration of the subject-hood and universal legal rights of rivers, following the landmark cases of the Vilcabamba in Ecuador, the Atrato in Colombia, the Whanganui in New Zealand, and the Yamuna in India.

Our work seeks to convey the life of a river through a distinctly transmission-based approach, more specifically, through the transmission of immersive sound. The sound of a river speaks of its life. From the minute droplets of ice melting high up in the mountains at the source, to the ferocious roar of the young river carving its way through the hills, and to the gentle ebb and flow as the river surrenders to the sea.

We have conducted fieldwork on the mythic river Acheloos in North-eastern Greece. The Acheloos is the Father of all Rivers, and a River God in ancient Greek mythology. The River Acheloos is also the subject of the longest water management and land right battle in the history of the International Court of European Justice. A case for the deviation of the river, which started in 1928, continues to this day (the latest decree was emitted in 2018 against the Greek government's Acheloos Deviation Project).

Names and affiliations: Juan José Díaz-Sacco, KUN Shi (Wildlife Institute, Beijing Forestry University, Beijing, China)

Title of presentation/panel/round table discussion: The status of research on the leopard (*Panthera pardus*) in China and implications for management of protected areas

Format: Poster presentation

ABSTRACT: Content (Maximum 300 words, for possible posting in the Symposium program after acceptance): The leopard (*Panthera pardus*) is classified as Vulnerable in the IUCN Red List and as Endangered in the Red List of China. Worldwide, populations of leopards are decreasing in many areas with range collapses in most of Asia. In China, the leopard is found in increasingly fragmented and isolated habitat patches. Leopard subspecies that are found in China are classified as Critically Endangered (e.g., *P. p. orientalis*) or have been recommended to be classified as Endangered (e.g., *P. p. delacourii*). Leopards receive little funding compared to other big cat species. Therefore, it is crucial to identify research priorities for this highly threatened species. Articles published within the last 40 years were reviewed. The aims were to identify geographic and taxonomic biases in published research, determine biases within current ecological knowledge and conservation issues as well as pinpoint key research priorities for the future. Throughout the review a geographic bias towards Northeast China, a taxonomic bias towards *P. p. orientalis* (over 50% of published papers) and a bias towards studies focusing on population and distribution and threats such as habitat destruction and prey depletion were found. This review outlines recommendations for future researchers, including the need to publish more research in international peer-reviewed journals, additionally focusing on the understudied subspecies and regions and on genetic research in order to clarify ecological and phylogenetic issues as well as on key threats such as diseases and human wildlife conflict.

Names and affiliations: LIU Likun (Wuhan Planning & Research and Exhibition Center), YAO Xiao (Hu Hanrong Railway Hubei Co., Ltd.)

Title of presentation/panel/round table discussion: Wilderness Protection in China under the Background of Natural Protected Areas System Reform - From the Perspective of Environmental Ethics

Format: Poster presentation

ABSTRACT: Maximum 300 words, for possible posting in the Symposium program after acceptance): Modern environmental ethics takes natural value as its important fulcrum and pays attention to the relationship between man and nature. From the perspective of environmental ethics, in recent years, the reform of China's natural protected areas system originated from the significant changes in Chinese people's understanding of nature and the relationship between man and nature. Wilderness protection should take this opportunity to form a systematic mechanism. And China's wilderness protection needs be based on the natural protected areas system, which regards wilderness as a part of the natural protected areas system running through the three levels which are national parks, nature reserves and other natural parks. And as multiple values of wilderness have different prominences in three levels, different conservation and utilization strategies should be developed based on this.

Names and affiliations: Jonatan Job Morales García, Ángel Daen Morales García (Biofutura)

Title of presentation/panel/round table discussion: The maker movement for the conservation of wildlife

Format: Poster presentation

ABSTRACT: Innovation is the engine of the economy today; however, although many innovations have emerged in recent years, the inequality gap continues to increase, since only a few take advantage of the benefits of innovations. For this reason, the maker movement emerges, from the MIT FabLab program, which is based on the generation of ideas, prototypes and innovations, to solve local problems, from the local. From this program, several innovations have been achieved and have democratized technology and the benefits of innovation, helping communities to solve their problems, and with that a whole movement called “maker” also emerged. In this sense, given its potential for success, this movement is seen as an option for the conservation of large cats, and with them their habitat, because they are umbrella species. This primarily has to take place in the local rural areas, to promote the development of appropriate innovations to the species and the ecosystem in question, as well as to favor the human settlements that coexist with these ecosystems, in order to reduce the overexploitation of biodiversity. These innovations must be of product and process, as well as social, and have to make use of traditional, tacit and explicit knowledge, to impulse conservation in an integral way.

Names and affiliations: Siddharth Agarwal (Veditum India Foundation)

Title of presentation/panel/round table discussion: Learning about rivers intimately through Walking

Format: Poster presentation

ABSTRACT: We're witnessing today a great need to protect our natural landscapes, from global climate factors as well as local actions/plans that lead to degradation, and often times even places us against the very authorities that have been created to protect our environment. Through the Moving Upstream project at Veditum India Foundation, we've been able to walk along rivers in India, around 4000kms to-date, learning from and documenting stories of rivers and riparian communities.

The 'Moving Upstream' project has found incredible resonance with young minds in India, even overseas. From Film Makers to Wildlife Biologists to publishers to Urban Planners and students, we've had a variety of young professionals walking along rivers - looking at the landscape intimately and making records for posterity, and also creating community networks for information dissemination.

The presentation intends to provide a glimpse into some of these records, through maps, images and graphics, while also putting forth an invitation for one-to-one discussions and to record the highly populated but scarcely documented landscape of India. More can be found at

<https://gcc02.safelinks.protection.outlook.com/?url=www.veditum.org&data=02%7C01%7C%7C8f69c869dc174b67ce5708d739fb51a1%7Ced5b36e701ee4ebc867ee03cfa0d4697%7C0%7C1%7C637041623894041725&sdata=8wAwviolMeydJhIXpSUA44k66uolJhW6NOrHv1XAvNw%3D&reserved=0>

Names and affiliations: Zdenka Křenová (Global Change Research Centre CAS, Czech Republic)

Title of presentation/panel/round table discussion: Silva Gabreta Monitoring: successful LTER transboundary cooperation

Format: Poster presentation

ABSTRACT: Thirty years experiences from the Bohemian Forest, central Europe, are going to be presented as an example of successful LTER transboundary cooperation and implementation of scientific knowledge to management of protected areas. The Bohemian Forest creates the most extensive forest landscape in Central Europe. The center of this area is protected as the Bavarian Forest National Park in Germany (BFNP, 242 km²) and the Šumava National Park in Czech Republic (ŠNP, 680 km²). Long-term databases of ecological data are available for this area, which has been recognized as an important site for monitoring the effects of climate change on central European biodiversity and ecosystem structure.

There is a long tradition of research and monitoring in the Bohemian Forest. The first forest nature reserve was declared as early as in 1858 to study natural forest development. For a long time, complex monitoring of glacial lakes recently recovering from acidification and hydrological monitoring in the Große Ohe headwater catchment were flagships of long-term transboundary research. The forests, mainly mountain spruce and mixed forests, cover more than 85% of this territory. Large areas of them have been subjected to significant natural disturbances (windstorms and bark beetle outbreaks) and several studies have focused on the causes and consequences of natural disturbance. Recently published results of biodiversity research in the BFNP and experiences with monitoring of mires in the ŠNP supported a necessity of multidisciplinary and transboundary research. To optimize methodologies and coordinate research activities a new project “Silva Gabreta – Monitoring of biodiversity and water regime” was jointly prepared. The project focused on monitoring of forest biodiversity, monitoring of mires and monitoring of aquatic ecosystems in a time of climate changes.

New scientific contributions and common databases have provided the basis for suitable management to maintain and enhance biodiversity and ecosystem services. The practical implementation of the common monitoring design with standardized methods set the starting point for a new unified LTER program in both National Parks.

Names and affiliations: Bikram Shrestha, Iva Traxmandlová, Pavel Kindlmann (Global Change Research Centre CAS, Czech Republic)

Title of presentation/panel/round table discussion: Population Dynamics of Snow Leopard and its Prey Species in Annapurna and Everest Regions of Nepal

Format: Poster presentation

ABSTRACT: The Sagarmatha NP (SNP) and the Annapurna Conservation Area (ACA) are the most important regions regarding snow leopard survival in Nepal. We have studied its population density and its prey, the Himalayan tahr in SNP and the blue sheep in ACA. Transects characterized by elevation and several topographic parameters were established to cover most of the typical biotope of snow leopard in study areas. Snow leopard and its prey were repeatedly monitored in SNP during dry seasons 2006, 2007, 2009 & 2015 and in ACA during dry season 2014 and wet season 2016. Encounter rate (sings/km) of scrapes marks are considered as the most reliable determinants for abundance indices. In all study areas we walked and searched for prey within each valley, divided into several polygons based on physical barrier such as river, deep gorge or high mountain.

Our study showed that number of scrapes/km was positively correlated with snow leopard density obtained by camera trapping. With data from ACA, we found that number of scrapes recorded during dry period 2014 were significantly higher than during wet period 2016. We believe that local livestock density and bad weather destroying the signs were the most important reasons. In SNP, there were some fluctuations and differences among several valleys but overall the tahr population has decreased 1989 -2015. These and many other results are presented and discussed in a new book (Springer, spring 2020) about our snow leopard research in Nepal, which is going to be presented during WILD11.

Names and affiliations: ZHANG Hui (Henan University)

Title of presentation/panel/round table discussion: Study on the Environment Value of City Wilderness in China

Format: Poster presentation

ABSTRACT: With the increasing frequency of extreme weather caused by global climate change, scholars pay more attention to the protection of wilderness within the city and the study of wilderness has gradually become an important and hot global topic. In the process of urbanization in China, a series of problems has produced as follows. China's urbanization is not a process of natural development, but a government-led urbanization. In this kind of development mode, the one-sided pursuit of urban planning focus is on the economic value of land, and ignores wilderness protection within the city, ecological value, environmental value and social value of wilderness itself. As a result, China's cities have largely lost their wilderness shelter and become concrete forests. Skyscrapers, harsh weather and smoggy skies, the city is not "let people have better life", but the pain of wanting to escape.

This presentation attempts to build an analytical framework of environmental economics to qualitatively and quantitatively evaluate the ecological and environmental values of the wilderness within the city, and to propose strategies for urban interior wilderness protection from the perspectives of government, community, NGO and individuals. The government should change its development idea and have a profound awareness of the environmental value of wilderness. Wilderness is not only a clearing, but also an integral part of the ecological environment, the matrix on which a green economy depends, and the home of the human soul. Therefore, the protection of wilderness is the long-term basis of economic development. The government should avoid over-development, and cultivate and promote conservation of wilderness-protecting. The power of communities and individuals to protect wilderness within cities should be valued. The government should give strong support to the efforts of NGOs to protect the wilderness.

Names and affiliations: Moulik Sarkar (Vidyasagar University), Ayan Khanra (Midnapore College), Shuvendu Das (Wildlife Institute of India)

Title of presentation/panel/round table discussion: Study on the Diversity of Birds of Midnapore Town and surroundings, Southern West Bengal, India

Format: Poster presentation

ABSTRACT: Birds were among the most widely surveyed group of animals that played a vital role in a diverse environment including terrestrial to the aquatic food web. This study aimed to find out the avifaunal distribution of the town of Midnapore and its surroundings. Area of research falls within the fertile alluvial and laterite plains that give rise to thick dry deciduous forests that harbor a wide variety of flora and fauna including birds. The methodology involves compiling all published databases including study articles, documents, e-bird, avia base, pictures of Oriental birds, etc. During our research period (May 2015-June 2018); we encountered 260 species belonging to 69 families and 19 orders, and after an adequate identification, several species from this study would be updated. The most frequently encountered species of birds such as Common myna (*Acridotheres tristis*) and Red-vented bulbul (*Pycnonotus cafer*), whereas species such as Mottled Wood Owl (*Strix ocellata*) and Jerdon's bushlark (*Mirafra affinis*) have been the least encountered; reported from West Bengal after a long time. Our research also recorded vulnerable species such as Lesser adjutant stork (*Leptoptilos javanicus*) and near-threatened species such as River tern (*Sterna aurantia*), Alexandrine parakeet (*Psittacula eupatria*), and Red breasted parakeet (*Psittacula alexandri*), which is mentioned in IUCN red list.

Names and affiliations: Harshini Yadvendradev Jhala (Wildlife Institute of India, Chandrabani, Dehradun, Uttarakhand), Qamar Qureshi and Simon Black (Durrell Institute of Conservation and Ecology, School of Anthropology and Conservation, University of Kent, Canterbury, UK)

Title of presentation/panel/round table discussion: Assessing the potential and feasibility of reintroducing two Grassland Megaherbivores, the Greater One-horned Rhinoceros and the Swamp Buffalo in their historic Global range.

Format: Poster presentation

ABSTRACT: Reintroduction to re-establish populations of endangered species is an effective conservation strategy, especially when original threats that caused local extinctions have been abated. Herein, we assess the available vacant habitats, their feasibility and strategies for reintroduction of greater one horned rhino and wild swamp buffalo in their historic global range. Both species face multiple threats due to anthropogenic causes and slow life history traits. This study uses Maximum Entropy Species Distribution Models to identify potential reintroduction sites across the Terai-Brahmaputra floodplains in India, Nepal and Bhutan. We prioritize potential sites based on level of protection, management, biotic pressures, area and habitat quality using population habitat viability analysis, site visits and interviews. Our results reveal that populations smaller than 100 for rhinos and 250 for buffalo were susceptible to extinction events, could not sustain poaching and required continuous supplementation or a metapopulation framework to persist. Although good vacant habitats exist, managers were reluctant to supplement or reintroduce rhinos due to the high cost associated with subsequent protection. The analysis identifies Corbett, Valmiki and Katarniagath as potential sites for rhino and buffalo reintroductions in India, while Chitwan and Shuklaphanta seemed ideal for buffalo reintroduction in Nepal. The establishment of new safety-net and supplementing existing populations of these megaherbivores would ensure their survival and harness their beneficial effect on ecosystem functions. This effect of megaherbivores on grassland habitats would make the grasslands suitable for re-establishing populations of other grassland species.

Names and affiliations: Chris Armatas (Aldo Leopold Wilderness Research Institute), Alan Watson (Aldo Leopold Wilderness Research Institute)

Title of presentation/panel/round table discussion: The Aldo Leopold Wilderness Research Institute archive: A treasure trove of wilderness data

Format: Poster presentation

ABSTRACT: The Aldo Leopold Wilderness Research Institute (ALWRI) has compiled fifty years of wilderness science, and it is freely available to all those who may be interested through project-specific archives. With over fifty different archives, one can access data, methodology descriptions, and corresponding publications for studies ranging from campsite conditions and fire history to visitor studies. The research archive represents a strong history in both social and biophysical research to inform recreation use allocation, controlling visitor impacts, and managing conflict and implementing fees. In more recent years, research has expanded to include fire restoration, ecological intervention, and environmental and land use change effects. Social science data includes a survey of sport hunters in Alaska, survey of conflict between hikers and horse users in the Charles C. Deam Wilderness, a study of special provision motorboat use on the Main Salmon River, and oral histories in the Sequoia and Kings Canyon National Parks. In some areas, such as the Bob Marshall Wilderness Complex and the Boundary Waters Canoe Area Wilderness, multiple studies have been completed over time, which allows for understanding trends in visitor characteristics, use evaluation of conditions encountered.

Names and affiliations: Soham Pattekar (Durrell Institute of Conservation and Ecology, University of Kent, UK/ World Wide Fund-India, New Delhi, India), Sanjay Gubbi (Nature Conservation Foundation, Mysore, India), Dr. Matthew Struebig (Durrell Institute of Conservation and Ecology, University of Kent, UK)

Title of presentation/panel/round table discussion: Fine-scale habitat use and detection of dhole (*Cuon alpinus*) in two protected areas of Western Ghats, India

Format: Poster presentation

ABSTRACT: The dhole population of India continues to decline due to habitat destruction, reduction in prey base, human-induced stressors and a possible threat from the competition with larger predators. Although at least 2500 mature individuals survive in the wild, there are few spatial data on dhole populations in the country. We assessed fine-scale habitat use and underlying ecological and anthropogenic factors affecting dhole detection in two protected areas in the Western Ghats. Data collected through extensive camera trapping was analyzed in a likelihood-based occupancy framework. The probability of habitat use for Cauvery Wildlife Sanctuary was estimated at 0.40 SE±0.17 in the year 2014 and 0.56 SE±0.34 in 2016. Similarly, we estimated the probability of habitat use at Malai Mahadeshwara Hills Wildlife Sanctuary to 0.60 SE±0.35 in 2014 and 0.40 SE±0.03 in 2016. Overall, detectability was found to be low. At the same time, we also found that relative abundance of key prey species such as Chital, Sambar, Gaur, and Wild pig strongly influenced the probability of habitat use of dhole, although the relative roles of different species varied by year. Human disturbance had a negative effect on dhole habitat use as well as detection probability. Through our findings, we aim to guide conservation management efforts for this cryptic species.

Name and affiliations: Fernando Sanchez-Trigueros (University of Arizona), Alan E. Watson (Leopold Institute), William T. Borrie (Deakin University)

Title of presentation/panel/round table discussion: Modeling travel behavior in wilderness: an update on data requirements, modeling approaches, analysis potential, and applications

Format: Poster presentation

ABSTRACT: In this poster, we revisit a modeling process that simulates visitor travel and campsite occupation decisions. The example from the Boundary Waters Canoe Area Wilderness (BWCAW), Minnesota, helps to illustrate the science, data, and technical requirements for travel simulation models that support permit quotas and other decision-making for wilderness. Using a computer-based survey, nearly 12,000 visitor itineraries were voluntarily contributed and analyzed. Entrance, exit, route and campsite location data formed the basis for a model of overnight visitor travel behavior for the BWCAW. In use of this model, groups entering the travel system are stochastically assigned an itinerary from the sample of collected travel routes, and are rerouted when camping areas in their original itinerary are fully occupied. Groups exit the system when they complete their itinerary. Outputs of the simulations describe predicted campsite occupancy level within a zone based on permits granted, number of available campsites, travel patterns, and observed use levels. To describe the probabilistic features of the model, a sample of 250 simulated permit seasons were generated and their spatial, temporal, and global features summarized. Spatial trends of occupancy across simulations show travel zones that tend to be underused or overused regarding average occupancy, and enables the mapping of potential campsite availability as well as identification of hot and cold spots for overnight camping in alternative quota scenarios.

Names and affiliations: Pratiti Priyadarshini, Himani Sharma, Anil Sarsavan

Title of presentation/panel/round table discussion: Economic Valuation of Restoration of Degraded Lands

Format: Poster presentation

ABSTRACT: Deforestation and land degradation have severely affected the health of systemic drivers – soil, moisture, nutrients, biomass, and biodiversity. While the need for restoration of degraded landscapes is being increasingly realized at global as well as national level, the value of restoration continues to be a relatively unexplored domain, and local communities, practitioners, conservationists, investors, and governments are often at a loss in attributing the economic significance of such efforts. A study was undertaken in two locations one from Joramahuda village of Pratapgarh, Rajasthan and another from Papsara village of Angul, Odisha with different social-ecological conditions, restoration period and governance arrangements using Natural Resource Accounting System framework (NRAS) to understand the value of direct and indirect benefits from restoration of commons. The indicators include a range of environmental aspects including standing biomass, the fertility of the soil, carbon sink, and other direct and indirect social and economic benefits accruing from the common land. In Joramahuda the total direct and indirect gain including standing biomass on 125 acres of common land was INR 15.6 million against the investment of Rs. 1.4 million which is almost eleven times the investment over five years. It was 75 times the investment in the case of Papsara over 27 years where the village has secure tenurial rights on 108 acres of common land. The total increase in standing biomass was from 4.5 MT/ha to 46.4 MT/ha and 1.22 MT/ha to 91.31 MT/ha in Joramahuda and Papsara respectively. These two cases highlight the value of secure tenure rights and local institutional arrangements in achieving better ecological and economic outcomes. They also highlight the potential of these lands in reducing carbon emissions and the need for enabling policies and programmes for improving the property rights of local communities.

Names and affiliations: Saneesh C S (Program Manager at Foundation for Ecological Security, Madanapalle, Chittoor, Andhra Pradesh)

Title of presentation/panel/round table discussion: 'Wisdom walk' a tool for transmission of traditional ecological knowledge.

Format: Poster presentation

ABSTRACT: Wisdom Walk was conceived as a conservation tool. It is a resource centric program that focuses on local biodiversity and it can be efficiently developed with the support of 'traditional knowledge holders' in a village, to evolve an educational program to understand plants, animals, their ecosystems and their management by various institutions. The program's focal participants are children, and the program is designed like an education tool. All aspects of this program are locally adaptable and hence easy to replicate anywhere. Expected outcomes of the program are to nurture growing up children to learn from and appreciate their immediate environment, to develop scientific acumen and to eventually make conservation a way of life.

Names and affiliations: Rushika Khanna (Academic Associate, CEPT University)

Title of presentation/panel/round table discussion: Transgressing Wilderness

Format: Poster presentation

ABSTRACT: Wilderness has been an integral part of our larger landscapes. Yet it lies in a precarious position ready to be usurped in the name of development. We can see 'Wilderness' transgressing from its norms of confined demarcated spaces into pockets within cities that engulf it. This transient wilderness, a large percentile of which is terra nullius within urban and peri-urban matrices, do not come across under the wilderness radar to all. The discourse on the subject will attempt to break away from the notion of treating such parcels of land as voids in the fabric, but rather will attempt to integrate it within our existential realm as an accepted form of a landscape construct. Wilderness has often been defined as large tracts of land lying untrammelled, but what occurs as formative processes within these larger tracts also furnishes itself within smaller parcels of land as subsets of the wilderness idea. What is important here is to understand 'wilderness' as a place rather than a space, which reflects a region's adaptation to change by expressing processes of the 'wild' and self-willed at varying scales.

A model that allows for assessing and validating a potential wilderness patch through multiple parameters, derived from the perceptions of wilderness, gives rise to the understanding of wilderness as a 'system.' This when evaluated with reference to a baseline such as the normative landscape of a region, may bring out its distinct elements and character that differentiates wilderness parcels from the other landscapes.

Names and affiliations: Nita Mihai Daniel, (Faculty of Silviculture and Forest Engineering, Transylvania University of Brasov, Brasov, Romania), Petru Tudor Stăncioiu (Faculty of Silviculture and Forest Engineering, Transylvania University of Brasov, Brasov, Romania)

Title of presentation/panel/round table discussion: Forest habitat connectivity in Romanian protected areas - implications for management and conservation

Format: Poster presentation

ABSTRACT: Forest management rules imposed on all forests in Romania provide habitat conditions for many species across forest landscapes, empirically proven by the high biodiversity of the Carpathians and their surroundings. However, they do not address explicitly the spatial arrangement of forest patches across landscapes and therefore, assessment of connectivity (inside tracts of continuous forest - i.e. intrapatch connectivity - and also among spatially separate patches – i.e. interpatch connectivity) is important. To analyze this, the CORINE Land Cover data set (2016) available for Romania was used. Forest patches were classified into three size categories ensuring survival of tree populations on short term, medium and long term: Interconnectivity Nodes, Habitat Islands and respectively Habitat Continuum. Connectivity of each patch to others around was assessed for a maximum threshold distance of 1 km. Results show a good connectivity of forest patches both in terms of intrapatch connectivity and interpatch connectivity. These results confirm that management guidelines inherited from the past are providing good conditions for connectivity of forests in general and for main forest tree species. Enforcement of these rules in the future should ensure conservation of species across the forested landscapes at a national level and also provide routes for migration in the context of climate change. However, as a large proportion of forestland is today non-state, financial incentives for private owners are a key condition to further accept these restrictions and ensure this major goal.

Names and affiliations: Dusty Vaughn (United States Department of Agriculture Forest Service)

Title of presentation/panel/round table discussion: Wilderness Stewardship Performance in the U.S. Forest Service

Format: Poster presentation

ABSTRACT: Signed in 1964, the Wilderness Act was landmark legislation that secured for present and future generations the benefits of an enduring resource of wilderness and established the National Wilderness Preservation System in the United States. The U.S. Department of Agriculture, Forest Service is responsible for managing approximately 37 million acres in more than 448 units of the National Wilderness Preservation System. The Forest Service's primary responsibility under the Wilderness Act is to preserve wilderness character. To ensure that these wilderness areas stay wild forever, the Forest Service has identified key elements that help define successful stewardship under a framework called Wilderness Stewardship Performance. The Wilderness Stewardship Performance framework tracks how well the agency meets baseline performance elements for preserving wilderness character. These elements combine the essential qualities/attributes of wilderness character as defined by the Wilderness Act. Only a few elements are required for each area agency-wide. Managers are given flexibility in the selection of individual elements to reflect local wilderness stewardship priorities. This performance framework improves upon previous measurement efforts through linkages to Wilderness Character Monitoring. The framework also seeks to foster improved integration and communication between program areas and to accurately reflect the collaboration required to steward Forest Service wilderness resources. Seeking to preserve wilderness character by working on Wilderness Stewardship Performance is more than the Forest Service can accomplish alone. The Forest Service is developing partnerships with local and national groups concerned with the health of the wilderness resource.

Names and affiliations: Jonathan Carruthers-Jones (University of Leeds, Leeds, UK), Rob McMorran (Scottish Rural College, Scotland), Steve Carver (University of Leeds, Leeds, UK), Christopher Hassall (University of Leeds, Leeds, UK), George Holmes (University of Leeds, Leeds, UK)

Title of presentation/panel/round table discussion: Participatory mapping of wildness: Assessing the potential of mixed methods walking research for ground-truthing national scale wildness quality mapping and supporting planning

Format: Poster presentation

ABSTRACT: A key challenge for the representation and protection of wild spaces and species is the diverse range of meanings attached to the idea of the 'wild'. This research explored the relationship between established spatial approaches to representing wildness, with more subjective human knowledge and perception captured *in situ*. Participatory walks, including *in situ* questionnaires were carried out at points along transects traversing urban-wilderness gradients at three study sites in the Scottish Highlands and French Pyrenees. A broad range of stakeholders (N = 71) were taken on these 'transect walks' and at pre-specified locations were asked a series of simple landscape assessment questions to quantify their perceptions of the immediate surrounding landscape in terms of biodiversity, naturalness, connectivity, wildness, landscape management and emotional experience. Participants were invited to make comments in order to explain their scores. After watching a short film on wilderness-related historical landscape change in the relevant study site an additional questionnaire collected data on attitudes to wild spaces and wild species reintroductions before and after the walk. This integrated participatory mapping technique is designed to improve the quality of wildness mapping and support more inclusive and sustainable approaches to the conservation of wild spaces and species.

Names and affiliations: Steve Carver (University of Leeds), Yue Cao (Tsinghua University), Rui Yang (Tsinghua University)

Title of presentation/panel/round table discussion: New approaches to mapping ecosystem integrity: Protecting the authenticity and integrity of natural ecosystems in China

Format: Poster presentation

ABSTRACT: China is currently undergoing a process of establishing a new national park system and reorganizing the existing protected area system calling for the strictest measures to protect the country's natural ecosystems. Here the role of Chinese national parks is to “protect the authenticity and integrity of the natural ecosystem” which refers to landscapes and ecosystems with high degree of naturalness, free from human disturbance and lack of human artefacts.

This paper outlines the concept of ecological intactness and its potential value/uses in planning for and making decisions about protected areas at multiple spatial scales (local, regional, national). The paper briefly reviews existing approaches to mapping intactness (e.g. roadless areas and human footprint mapping) and provide a critique of these. We then describe a new methodological approach to modelling and mapping ecological intactness based on high resolution and high integrity datasets of human land use and infrastructure (roads, railways, power/pipe lines, settlements and land use). These are developed and demonstrated using data from China as an example of a large country with a highly variable distribution of human impacts across a range of biomes and landscape types.

Names and affiliations: Dr Dharmendra Chharang, Dr Sheela Choudhary, (Department of Animal Nutrition, Post Graduate Institute of Veterinary Education and Research, Rajasthan University of Veterinary and Animal Sciences, Jamdoli, Jaipur INDIA)

Title of presentation/panel/round table discussion: Allometric Relationship of Body Measurements in Asian Elephants

Format: Poster presentation

ABSTRACT: The sizes of body parts often co-vary through exponential scaling, known as allometry. The elephant is the largest living terrestrial mammal. However, an accurate statement about its size either in terms of weight or height is still difficult to find. Accurate estimation of body weight is very useful for evaluating the nutritional status, general health, feeding schedule and drug doses for treatment as well as for chemical immobilization. However, it is impractical to weigh elephants due to their enormous size and tremendous weight, and also due to lack of a suitable weighing machine. Weighing an elephant is a difficult task, as it requires a special training program, skilled handlers and special scales. Hence the only way to estimate their body weight is by using prediction equations based on certain body parameters. A preliminary study was conducted on 18 captive Asian elephants to investigate the relationship between heart girth and body weight as well as between feet circumference and height. Heart girth measurements were taken four times, on day 0, 20, 50 and 60 of the study to calculate body weight whereas, circumference of feet was taken once, at the end of study. The equations involving parameters such as heart girth and feet circumference were found to be the most reliable to estimate body weight and height, respectively. The body weight and height of domestic Asian elephants can be reliably calculated from various body measurements.

Names and affiliations: Roger Semler (National Park Service Chief of Wilderness Stewardship), Ralph Swain (Regional Wilderness and Rivers Program Manager, US Forest Service)

Title of presentation/panel/round table discussion: The "art of Wilderness rangering."

Format: Poster presentation

Abstract: This presentation will provide an overview of the role and function of Wilderness Rangers who serve as the heart and soul of America's wilderness preservation system. The presentation illustrates the competencies, training, certifications, protocols and priorities that collectively contribute to a progressive wilderness ranger program.

Names and affiliations: Sarita Fernandes (Chief Conservation Officer, Sagahshakti: Coastal and Marine Research Division of Vanashakti)

Title of presentation/panel/round table discussion: Stakeholder Inclusion Approach in Conservation efforts of Sea Turtles in Morjim (Goa): MARINE BIODIVERSITY AND CONSERVATION: FIELDWORK CASE STUDY SARITA FERNANDES

Format: Poster presentation

ABSTRACT: The Morjim - Sea Turtle Conservation project is a conservation and policy effort for the conservation of a demarcated turtle nesting beach in Morjim Goa, India. Morjim is a village in North Goa on the Western Coast of India, and a nesting site for Sea turtles. The site is a demarcated turtle nesting zone with protection under the The Wildlife Protection Act (1976) and the Coastal Regulation Zone (CRZ) notifications, 2011. These nesting sites are active between the months of October and June. Olive Ridleys and Green sea turtles, the two species of sea turtles found on Morjim beach are listed under the IUCN Red list as 'Vulnerable' and 'Endangered' species with their population trends 'declining'.

Morjim beach is also a conflicted space since a decade between the beach shacks and sea turtle conservation efforts and programmes. The beach shacks operated under the beach shack policy are owned by locals of villages in and around Morjim beach. The beach shack business proves as the only means of income and livelihood for these locals. The beach shack policy secures licenses to locals with experience in the industry. The objective of the case study described here is to assess the option of stakeholder inclusion - the beach shacks into the conservation dialogue of sea turtles at Morjim beach. The main deliverable is to create an opportunity of dialogue and participation among the beach shacks into the project and include them into the conservation efforts by creating avenues of tourism -income generation through sustainable conservation options.

Names and affiliations: Cindy C. Chojnacky, David C. Chojnacky (Wilderness Need Association, Hailey, ID)

Title: Wild nature administration—might protection efforts be outpacing on the ground administration?

Format: Poster presentation

ABSTRACT: Since the late 1950s, considerable emphasis worldwide has been placed on land protection. In 1959 the United Nations (UN) Economic and Social Council called for a list of national parks and equivalent resources; leading to the first UN List of Protected Areas in 1962. According to the International Union for Conservation of Nature, today there are 202,467 protected areas covering almost 14.7% of the world's land, excluding Antarctica. Of these, 10 percent are in the U.S. in 25,000 protected areas—a wide variety of management regimes from state and national park to tribal parks to wild and scenic rivers to wilderness; 803 areas are wilderness. Cambodia, a developing country in Southeastern Asia known for its biodiversity and diminishing tropical forests, has passed proactive laws in 1999 and 2008 to create a system of protected areas.

This presentation will compare visitor experience of on-the-ground administration of some U.S. wilderness and Cambodian protected areas. Cambodia has no wilderness per se but has protected areas in eight categories. Our cursory experience encompassed three national parks, two wildlife sanctuaries and a protected forest, along with locally protected community forests and two UNESCO sites (Angkor Wat and Preah Vihar Temples) in Cambodia in 2012 and 2013. In the U.S., we visited 60 wilderness areas between 2012 and 2019. Although the legislation, history, infrastructure, budget and visitation for U.S. protected areas far exceeds that of fledgling Cambodia, we saw one similar trend between these two countries: much energy given to the policy framework and broad-based protection initiatives from government and non-government sectors but much less emphasis and funding for on-ground stewardship or visitor information. In both countries, special uses (concessionaires in Cambodia and exempted uses in U.S.) have had detrimental impacts.

Names and affiliations: Ayesha Akhter Zhilik (Research Associate, Nature Conservation Society), Ebtisamul Zannat Mim)

Title of presentation/panel/round table discussion: DNA Barcoding of Commercially Important Sharks in Bangladesh

Format: Poster presentation

ABSTRACT: Sharks are one of the principal fisheries commodities that are currently exploited on a large scale because of their high economic value. The identification of sharks has been difficult due to the specimen's similarity in morphology and inadequate information on its diversity. This study aimed to identify the shark species and thus to establish a phylogenetic relationship among shark species using molecular approaches. In the present study, we adopted a DNA barcoding technique using a 655-bp fragment of the mitochondrial cytochrome c oxidase I (COI) gene to identify shark species collected from all three fish landing centers (BFDC fish harbor of Cox's Bazaar, Alipur Patuakhali and Fishery Ghat of Chittagong). A total of eight species (*Carcharhinus sorrah*, *C. leucas*, *C. amboinensis*, *Scoliodon laticaudus*, *Sphyrna lewini*, *Chiloscyllium burmensis*, *Rhizoprionodon oligolinx*, and *Galeocerdo cuvier*) including one new record (*Chiloscyllium burmensis*) from Bangladesh were confirmed by morphology with Gen Bank accession numbers. These species showed definitive identity (99-100%) with the pre-existing sequences of NCBI GenBank. Multiple sequence alignment was done using the sequences amplified in our study as well as the reference sequences from NCBI. Thus a phylogenetic relationship was constructed where species in the present study were clustered independently under their respective Orders. GC content at different codons both for the 8 shark species and the Orders showed that the pattern of % GC content at different codons was 1st>2nd>3rd. Being the first record of a DNA barcode dataset of the shark species in Bangladesh, the present study evidently shows that DNA barcoding can serve as an effective tool to identify and discriminate shark species diversity so that necessary measures can be taken for their conservation.

Names and affiliations: Arthur Reinelt (National Park Administration Bavarian Forest)

Title of presentation/panel/round table discussion: Getting field data where there is no cell reception with your smartphone

Format: Poster presentation

ABSTRACT: Getting field data in remote areas is one of the most expensive tasks in wilderness management. Therefore there are always new approaches to increase the effectiveness of field data collection. Offline mapping with handheld devices has been around for at least two decades. It seems not to be something really new to talk about. But as known, there have been major improvements in software as well as hardware in recent years. In the Bavarian Forest National Park we have tested an application (App) which runs on most Android or Apple Smartphones. This technology lets you work day after day with smartphones as your GIS device in the field. This opens new possibilities for getting field data more effectively and with less errors directly into your databases.

Names and affiliations: Martin Hawes (Independent researcher), Grant Dixon (Independent researcher)

Title of presentation/panel/round table discussion: Proposed global definition of wilderness

Format: Poster presentation

ABSTRACT: The current lack of consensus on how wilderness should be defined hampers global efforts to identify, protect and conserve areas of outstanding wilderness quality. Most existing definitions focus on the ecological values of wilderness while under-recognising or ignoring its human experiential values, such as opportunities for recreation and spiritual inspiration. In particular, few definitions recognise the significance of remoteness, which for many visitors is an essential component of the 'wilderness experience' and also contributes to the ecological integrity of wilderness. We propose a definition that recognises the ecological and experiential values of wilderness, and that incorporates remoteness as a defining characteristic of wilderness. General adoption of this definition would support the establishment of common benchmarks for wilderness quality, including in relation to formal recognition of globally significant wilderness areas (such as under the World Heritage Convention), and would provide a common framework for global and regional inventories of wilderness. We outline some practical implications and benefits of adopting this definition for how wilderness areas are identified, assessed, mapped and managed. We give examples of how the definition could be applied in different geographical and cultural settings, and suggest basic standards for delineating and inventorying wilderness.

Names and affiliations: Mr. Tushar Kulkarni (Associate – Giraffe Conservation Foundation)

Title of presentation/panel/round table discussion: Giraffe, Conflicts in the wild, Conservation and Role of GCF

Format: Poster presentation

ABSTRACT: Giraffe, *Giraffa camelopardalis* (Linnaeus, 1758), is the world's tallest land mammal and largest of the ruminants. It remains widespread across southern and eastern Africa, with smaller isolated populations in west and central Africa. Giraffe have adapted to a variety of habitats, ranging from desert landscapes to woodland/savanna environments, but live in non-continuous, fragmented populations across sub-Saharan Africa. Giraffe inhabit twenty one African countries and are considered a keystone species in African savannah ecosystems. While IUCN currently recognized the traditional concept based one species (*Giraffa camelopardalis*) and nine subspecies of giraffe, a recent comprehensive genetic assessment of giraffe by Giraffe Conservation Foundation (GCF) and partners in 2016 revealed that there are four distinct species of giraffe, and two of these species have two and three subspecies respectively. Historically, giraffe were considered as of 'Least Concern' by IUCN. However, in the 2016 IUCN Red List assessment, they were classified as 'Vulnerable' based on an estimated almost 40% decline to less than 100,000 individuals. This was further emphasized when the majority of the IUCN recognized subspecies were assessed in 2018 – some as Critically Endangered. Most recently, GCF estimates the decline to only be ~30% in the last three decades with an estimated 111,000 individuals (GCF 2019). Interestingly, giraffe have already gone extinct in at least seven countries in the last century. Human population growth and encroachment, habitat loss and fragmentation, changes through expanding agriculture and mining, illegal hunting, increasing human-wildlife conflict and civil unrest are all factors that are pushing giraffe towards extinction. Major initiatives by GCF like designing the Africa-wide Giraffe Conservation Strategic Framework, Genetic research, Population surveys and assessment, GPS satellite collaring, Giraffe translocations, Environmental Education and working closely with IUCN SSC Giraffe and Okapi Specialist Group (GOSG), have served a vital role in conservation and management of giraffe populations across Africa.

Names and Affiliations: Sanatan Deka, Bhaskar Choudhury, Rahin Barman, Kaushik Deb, Daoharu Baro and Nazrul Islam (Wildlife Trust of India)

Title: Bringing Back Manas: Restore and Secure a Dwindling Natural World Heritage Site

Format: Poster presentation

Abstract: Manas Wildlife Sanctuary was inscribed in the list of World Heritage Sites (India) (N338) by UNESCO IUCN under the criteria: (vii), (ix) and (x) in 1985. The landscape however was engulfed in the politico-ethnic violence from late 1980s till early 2000 by the Bodo community of Assam for their greater political and civil rights. The violence caused large-scale damage to the area and resulted in decimation of several wildlife species including the Greater One-horned Rhinoceros. Consequently, the UNESCO World Heritage Committee decided to put it in “In Danger” in 1992. The formation of “Bodoland Territorial Council” (BTC) in 2003 created an opportunity to rebuild the heritage site for the conservation fraternity with strong political support of the territorial government. Wildlife Trust of India (WTI) started working in 2004 with a vision of creating a larger “Greater Manas Conservation landscape” encompassing an area of nearly 1,500 km² in India and nearly another 1,500 km² in Bhutan to maintain the ecological integrity and functionality of the entire landscape. The landscape, located in the Sub-Himalayan “*Bhabar Tract*” and supporting 11 major river system, which are lifeline for the dominant agrarian community of around 70,000 population living downstream. WTI’s work centered around three strategies- a) Bringing increased areas under protection, b) Augmentation of animal numbers and improving their protection and c) Involving local communities in conservation. The reintroduction of One-horned rhinoceros from 2006 had contributed the population to 39 in 2019. The rehabilitation of Elephant, Clouded leopard, Tiger, Aisatic Black Bear and the 83 individuals of Eastern Swamp deer counted in 2019 was the result of successful translocation of 36 individuals from Kaziranga NP. Manas regained its pride in 2011. The PA was increased by 70% by declaration of the First Addition to Manas National Park covering of 350 km² in 2016 and the forest resources extraction to about 9% households was reduced.

Names and affiliations: Dr. Nicole Benjamin-Fink, Conservation Beyond Borders, Prof. Brian K. Reilly, Head of Department, Nature Conservation, Faculty of Science, Tshwane University of Technology, Staats artillery Road, Pretoria, South Africa.

Title of presentation: The next frontier in combating the illegal wildlife trade; Quantifying embedded uncertainty

Format: Poster presentation

ABSTRACT: The illegal wildlife trade is decimating endangered species worldwide. Two of the defining insights from the past three decades of scholarship on biodiversity conservation status and governance is that conservation-based solutions fall short when failing to address peoples' objectives, and that The Ecologists' dilemma spans across disciplines and countries. On the regional scale, governmental officials, NGO leaders, wildlife managers and ecologists face a dilemma: providing scientific-based guidelines for wildlife-related decisions, while constrained by insufficient data and limited resources. As such, biodiversity custodians are falling short of their goals.

The Wild11 addresses important international and regional conservation stewardship and achievement. In a climate of one million endangered species, employing participatory-based networks to establish comprehensive guidelines can change biodiversity loss trajectories. We discuss the applicability of Bayesian Networks (BNs). We acknowledge that despite their efficiency on modelling multi-faceted ecological processes leading to informed decision making, only 4.2% of environmental studies published during 1990-2018 utilized BNs. We therefore suggest that BNs' ability to deconstruct complexities, infer, and predict trade-offs within the ecological and environmental discipline remains underexploited, largely due to a gradual learning curve and computational expense. Our discussion will contextualize participatory-based modelling strategies via frameworks, mind-maps, and roadmaps. Specifically, we identify a much-needed cognitive paradigm shift in the way wildlife and habitat conservation is currently approached and achieved. Since these networks are based on empirical data, we discuss how best to communicate with subject matter experts and integrate their knowledge when addressing some of the most challenging conservation concerns of our time. Lastly, perceived challenges will be overcome by roadmaps aimed to quantify trade-offs embedded in biodiversity-related decisions.

The overarching goal is to promote informed wildlife decision-making in a climate where resources are scarce and data is limited. By considering all stakeholder objectives and drivers, the global conservation community may promote feasible strategies with high probabilities of willingness of implementation.