Conservation Geopolitics Forum

Abstracts

19th – 22nd March 2019

Wildlife Conservation Research Unit,
Department of Zoology, University of Oxford

Worcester College
Walton Street, Oxford, OX1 2HB

Abstracts listed in order of presentations

TUESDAY 19th MARCH

Opening Plenary
Inger Andersen, Director General, IUCN

WEDNESDAY 20th MARCH

A welcome and a purpose: The Conservation Geopolitics Forum – how we got here and where we're going

David Macdonald, Director of WildCRU, Zoology, University of Oxford, UK

In this brief introduction to the first ever conference on Conservation Geopolitics, and anticipating us spending three days discussing the future of this emerging discipline, I begin by explaining how we, at the WildCRU, arrived at the exciting position of welcoming 170 delegates to this futuristic discussion. From WildCRU's beginnings in 1986 we have dedicatedly used biological sciences and, increasingly, a mix of social sciences to deliver our mission: to achieve solutions to conservation problems through original scientific research. Increasingly aware that biology was necessary, but not sufficient, to delivering the well-being of both wildlife and people, six years ago a group of five of us began exploring a journey from the groundedness of our earthy fieldwork, often with very poor communities, to geopolitics and the high level processes that frame decisions guiding the human enterprise. This journey caused us to recruit collaborators from economics, law, international relations, development, marketing, anthropology and ethics into an increasingly holistic transdisciplinarity that led us to coin the term Conservation Geopolitics. Exactly what this means, and what we should do with it, is the topic of our Forum, and we are thrilled to welcome a remarkable group of delegates to energise this discussion. While we have more important things to do than fret about definitions, our first attempt at a formal one characterises Conservation Geopolitics as the linkages between conservation outcomes and the political, social, and economic arrangements within and (resulting) relationships between countries. More loosely, it is the holistic stuff beyond biology that we need to know in order to conserve the natural world. We, your hosts for three days, welcome you warmly, thank you for coming, and look forward to working with you to shape the future.

Global Challenges in Wildlife Conservation 1

Session chair: David Macdonald, Director of WildCRU, Zoology, University of Oxford, UK

Global food and conservation
Sir Charles Godfray, Director of Oxford Martin School, University of Oxford, UK

The talk will draw on recent modelling at the Oxford Martin School, Oxford University that brings together economic, health and environment drivers to explore the challenges and opportunities of remaking the food system to obtain multiple and positive, health, environmental and social outcomes.

The geopolitics of human-wildlife conflict
Alexandra Zimmermann, IUCN and WildCRU, Zoology, University of Oxford, UK

Conflicts over wildlife, often referred to by conservationists as 'human-wildlife conflicts' (HWCs) pose a serious and widespread threat to the survival of numerous species around the world. HWCs also severely affect the livelihoods, security and wellbeing of communities, and present significant dilemmas to nations trying to align conservation and development goals. Almost every country in the world grapples with some form of HWC. Ranging from tensions over wolves in rural Europe, to fruit bats in the Indian Ocean, and elephants across

thirteen countries of South and southeast Asia, these conflicts span hugely diverse geographic, political, cultural and ecological realities. Not only is HWC an increasingly urgent global conservation and development challenge, it is one that is extremely complex. No two cases are ever alike, and it is the geography, political ecology and culture of each that determines its potential solutions. At a local scale, such solutions often take the shape of community-led damage control and livelihood offset measures, but at larger scales, HWCs are shaped entirely by geopolitical factors. HWCs become geopolitical for example where a species requires trans-border cooperation, where they are affected by humanitarian crises or violent conflicts, or where decisions about the species' fate are formed more by political pressure than scientific evidence. With the lack of directly transferrable solutions from one case to another, and a global urgency to expand our efforts in wildlife conflict resolution, the question of scaling – both geographically and politically – inevitably arises out of every debate and discussion about HWCs. Sustainable human-wildlife coexistence can be achieved, but it requires conservation science to engage with a much deeper understanding of the human dimensions and geopolitics of our interactions with the natural world.

The continuum between climate change, conservation and human mobility

Cosmin Corendea, Jindal Global University Law School, India

This presentation explores social and legal aspects of environmental change*, disasters and human mobility** in the context of conservation, using global level experiences to inform domestic and regional frameworks. As human mobility is often regarded as adaption (to climate change), the extension of its application in the conservation area as a measure to protect is being perceived as naïve, nevertheless within its margins of appreciation. It is an injustice that the poor and vulnerable in developing countries, who have contributed least to climate change, are already carrying a disproportionate burden of the impacts associated with climate change. Affected communities are already adapting to these impacts, since the impacts are acting as a risk multiplier, affecting people's livelihoods, health, food security, water security and human mobility. It is important that their rights are safeguarded, including their right to development, but limited to both natural resources and wildlife conservation(s). Countries also develop solutions and approaches to the impacts of climate change including mobility options. In order to make these solutions and approaches sustainable, they must be supported by a legal framework- both in human and non-human context. The rule of law needs to be brought into the climate change process at the local, national and international level in order to protect rights, reduce risk, build resilience, empower people, promote efficient conservation measures and facilitate positive migration and not create sudden 'large scale movements'.

* Where environmental change may represent environmental degradation, climate change, weather change or seasons shifts

** where human mobility represents an inclusive concept of migration, forced migration/ displacement and relocation.

The central role of connectivity in conservation geopolitics

Samuel Cushman, Director of the Center for Landscape Science, US Forest Service, Rocky Mountain Research Station, USA

Geopolitics focuses on how geographical and spatial factors affect international policy and politics. Toblers law, known as the first law of geography, is that all things are connected but near things are more connected than far things. Connectivity science, therefore, is central to geopolitics. Modern connectivity science emerged from transportation geography and spatial econometrics and migrated and evolved in the field of ecology. These methods are now going full circle back from ecological research into economics, sociology, and geopolitics. This presentation reviews the origin and evolution of connectivity science and discusses the current and possible future pathway of integrating spatial modeling of connectivity with conservation geopolitics.

Global Challenges in Wildlife Conservation 2
Session chair: Tim Hodgetts, WildCRU, Zoology and Worcester College, University of Oxford, UK

Economic development, tourism and conservation
Joseph Mbaiwa, University of Botswana

This paper draws on the sustainable tourism framework to examine the economic development, tourism and conservation in developing countries. The paper argues that the global tourism market has become more specialised and segmented, with nature-based tourism dominating in most developing countries. For example, much of southern Africa's tourist industry relies on national parks, game reserves and other protected areas containing world-renowned wildlife, biological diversity and natural attractions. The foreign income generated in destinations areas has stimulated the development of a variety of tourism infrastructure and facilities destinations areas. Most governments encourage the growth of tourism mainly because it encourages tourism investment and the expectation that it will contribute to economic development. Despite its positive socio-economic impacts, tourism in developing countries is associated with revenue leakages, corruption, human wildlife conflicts, wildlife declines due to poaching and negative environmental impacts. Governments in tourism destination areas have developed conservation policies and strategies to promote sustainable tourism. However, these policies suffer from lack implementation, monitoring and poor policy linkages with the domestic economy. To address these limitations, tourism development should adhere to the ideals of sustainability to achieve biodiversity conservation, improved rural livelihoods and sustainable economics in developing countries.

Econ 101: a threat to biodiversity
Kate Raworth, Environmental Change Institute, University of Oxford, UK

Economics is the mother tongue of public policy, so how it frames the living world matters. If we are to thrive in the 21st century, argues Kate Raworth, then we urgently need to replace the outdated economic theories that are still taught in universities worldwide with new economic foundations that reconnect humanity to the rest of nature.

Keynote: Infrastructure armageddon and the world's rarest ape
William Laurance, James Cook University, Australia

We are living in the most explosive era of infrastructure expansion in human history. The most ambitious scheme is China's Belt & Road Initiative, which will involve over 7,000 planned infrastructure and extractive-industry projects that span much of the planet. Chinese President Xi Jinping promises the Belt & Road will be "green", "low-carbon" and "sustainable", but I argue that this is blatantly misleading. I will illustrate the harsh realities of the Belt & Road by describing the plight of the Tapanuli Orangutan, the world's rarest great ape. I will then highlight strategies to lessen the most urgent environmental and societal hazards of the global infrastructure tsunami.

Disciplinary Approaches to Conservation Geopolitics, Session 1
Session chair: Claudio Sillero, Deputy Director of WildCRU, Zoology, University of Oxford, UK

Overcoming anarchy: the good, the bad, and the ugly of international politics
Dominic Johnson, Department of Politics and International Relations, University of Oxford, UK

The discipline of international relations (IR) celebrates its centenary in 2019, having emerged after the First World War as a sustained effort to understand the persistent problem of conflict among states and to search for broader solutions. Compared to other disciplines, IR is young and still maturing. Despite observing the same dataset of global history, there is little consensus, with fundamental assumptions still hotly contested,

and no universal “laws”. There is, however, one point of broad consensus, which is “the problem of anarchy”. Cooperation within states (domestic politics) is—relatively speaking—easy, or at least possible, because there is a government and laws which sit above citizens and groups and can encourage, compel, and enforce cooperative agreements or violations thereof. Collective action problems are therefore easier, and can be solved domestically.

Cooperation between states (international politics) is entirely different, because there is no overarching authority or “Leviathan” which sits above states to compel or enforce behaviour. Collective action problems are therefore much harder, and cannot always be resolved at international level. It also makes IR a special—and an especially difficult—subset of political science.

Of course, there is the UN and many other international institutions, but they are fundamentally limited and not sovereign—they are clubs, not Leviathans. They also often reflect the underlying interests of the most powerful states, rather than leveling them. Finally, states have many competing interests, and conservation is often far down the list. In the international realm of cooperation among states, therefore, the deck is stacked against collective action, and against conservation in particular. This is a gloomy picture, but it is the lesson of international relations. Understanding the game, however, allows us to devise solutions.

International Law
Catherine Redgwell, Department of Law, University of Oxford, UK

Thinking (geo)politically: A political ecology of conservation and global security
Rosaleen Duffy, University of Sheffield, UK

Conservation is, and always has been, (geo)political. While there has been a recent ‘security turn’ in conservation, it is important to place this is wider historical context. From the inception of the conservation movement at the height of British Imperial ambitions, to current responses to the illegal wildlife trade, geopolitics has infused conservation thinking and practice. I offer a political ecology reading of conservation to tease out the multiple ways in which conservation and geopolitics can intersect. I will focus on responses to the illegal wildlife trade as an illustrative example. The spikes in poaching of elephants and rhinos forged a renewed sense of urgency in conservation, a call to *do something* to tackle poaching and trafficking before they drive species to extinction. On the surface this seems to be a story about conservation and how it is changing in response to an emergency. However, I will look more deeply into these shifts and reveal how it is actually a story about capitalism, the security industry it sustains, the interests of powerful actors in the international system and the fundamental restructuring of our relationships with nature.

Disciplinary Approaches to Conservation Geopolitics, Session 2
Session chair: Amy Dickman, Senior Research Fellow, WildCRU, Zoology, University of Oxford, UK

Economic drivers and solutions to conservation
Cameron Hepburn, Smith School, University of Oxford, UK

Efforts at conservation, while having some particularly striking successes, are painfully inadequate when compared with the scale of existing economic pressures. These pressures will increase as human populations continue to grow and as global economic output more than doubles by 2050. A "general equilibrium" economic perspective is required to understand the economic drivers of habitat and species loss, how these might be addressed while managing "leakage", and how we can meet rising human demands while preserving space for nature. New technologies (e.g. innovative protein provision) in addition to shifts in norms and behaviours are highlighted as elements of a systemic approach to conservation.

Environmental geopolitics: an inquiry into geographical knowledge in conservation
Shannon O'Lear, University of Kansas, USA

This paper borrows the analytical approach established in *Environmental Geopolitics* and applies it to wildlife conservation. The objective is to examine different ways that conservation subfields utilize geographical knowledge selectively. With the understanding that discourse is not only text and narrative, but also materiality, practice, and identity, it is possible to assess different ways that wildlife conservation work produces, promotes, and sometimes challenges established forms of knowledge and power. The paper considers three key observations about familiar discourses of wildlife conservation: 1) the role and meaning of the environment is not always specified; 2) humans' role tends to be considered selectively; and 3) insufficient attention is paid to spatial dimensions of human-environment interactions. Recent work in wildlife conservation scholarship provides examples to illustrate how scholars are challenging dominant narratives about conservation and dynamics of power inherent in conservation narratives, practices, identities, and materialities.

Conserving biodiversity on purpose: the role of ethics in solving an interdisciplinary problem
John Vucetich, Michigan Technological University, USA

The problems are stark: *20% of vertebrate species are threatened with extinction, the average vertebrate species has been extirpated from two-thirds of its former geographic range, humans are making the planet unsafe for human life, and 85% of human wealth is held by 10% of the humans*. The goal seems crystal clear: *avert the biodiversity crisis and realize sustainability – across scales, local to global*. However, the principles of ethics indicate that the goals – or better to say – the underlying purposes of sustainability and conservation are underspecified to the point of significant detriment. The principles of ethics – especially when conjoined to behavioral sciences – shine an essential light on the path toward resolving these purposes. This light is not necessarily promulgation of one ethical view or another. This light is, perhaps more importantly, a rich means of more deeply understanding various ethical views that underlie human behavior.

THURSDAY 21ST MARCH

International Politics and Conservation
Session chair: Shannon O'Lear, University of Kansas

Using "spatial subsidies" to address geopolitical imbalances in the ecosystem benefits and conservation costs of migratory species
Charles C Chester, Tufts and Brandeis Universities, USA, James Dubovsky, Michelle Haefelle, Aaron Lien, Brady Mattson, Rodrigo Medellin, Darius Semmens, Wayne Thogmartin and Laura Lopez-Hoffman

Dating back to the dawn of the 20th century, many of the earliest international and transboundary biodiversity treaties concerned the protection of certain migratory species—typically those that provided a direct utilitarian benefit (ecosystem services) to humanity. Since that time, more than fifty international agreements have focused on migratory species. While some form of utilitarian benefit has often—if not universally—been articulated in the text of these agreements, there has been no significant focus on the intertwined factors of (1) where the utilitarian benefits of migratory species occur, and (2) where the most significant conservation costs are borne. Geographic imbalances between these two factors have been described as "spatial subsidies," with the implication that utilitarian benefits in one portion of a migratory species' range are being subsidized by conservation costs incurred in another. These benefits and costs are often separated by international borders. While costs and benefits are spread across the full migratory range, to what degree does this imbalance imply an ethical obligation or economic justification for cross-border payments-for-ecosystem-services (PES)? And to what degree could or should these imbalances be considered in cross border treaties?

Here we use spatial subsidies as framework for thinking about the distribution of costs, benefits and obligations of biodiversity conservation across borders.

The geopolitical priorities of US biodiversity conservation: mapping the activities and funding of the US Fish and Wildlife Service's International Affairs Program.
Francis Massé and Jared Margulies, University of Sheffield, UK

In this paper we contribute to an understanding of conservation geopolitics, and what conservation geopolitics might do, through a multi-scalar analysis of international conservation funding. Using the case of the United States Fish and Wildlife Service (USFWS) International Affairs Program – the US Government's lead wildlife agency – we combine quantitative and spatial analysis with in-depth qualitative data to develop a framework for researching questions related to conservation geopolitics and what such a politics might look like. We ask the following: What types of activities is the USFWS International Affairs program funding, and where? Are there changes over time in what, who, and which geographies receive funding? How, if at all, do these changes overlap with evolving discourses around wildlife crime and other geopolitical priorities? We answer these questions through a two-fold process. First, we conducted a global meta-analysis of 3,800 projects funded by USFWS since 2002. Second, we interviewed personnel in USFWS, other conservation and security organisations, and conducted place-based research to understand how funding decisions are made, influenced, and with what implications. What emerges is a picture of the macro and micro trends and dynamics that constitutes an empirically rigorous and conceptually innovative approach to doing and understanding conservation geopolitics.

Geopolitics, meat and biodiversity.
Patricia Manzano, Universidad Nacional Autónoma de México

Meat, specially beef, is one of the main drivers of greenhouse gases, deforestation, habitat and biodiversity loss, water use and pollution. Meat production has a global impact because production of grains and oil-seeds to feed animals, animal breeding, rearing, selling and slaughter involve transportation across long distances, within countries and across borders and even continents. Policies toward meat production in one country can have disastrous effects half way around the globe, for instance, in biodiverse regions. The Amazon forest in Brazil is being lost due to soybean production for animal feed and cattle raising, part of which supplies international markets. Subsidies towards grain production for cattle feed, allows selling cheap meat to third countries, the hidden costs are paid by the environment through biodiversity loss. The United States has a history of producing cheap grain in surplus, which has been used by the cattle industry to produce meat and promote the meatification of diets. This meatification is a vector of environmental degradation. Since demand can affect the meat market, changes in consumer behavior to a less meat diet can be a strategy to impact and decrease meat production. Meat is mostly consumed in rich countries, and by rich people in developing countries. Poor countries have high biodiversity, a low meat consumption and high grain need for human consumption. Environmental, social and cultural costs should be incorporated in to the meat price.

Geopolitics of the blue belt conservation network within UK overseas territories
Peter Howson, Roy Smith and Elizabeth Kirk, Nottingham Trent University, UK

To address threats of overfishing, plastic pollution, and other forms of human-induced marine habitat degradation, the UK Government has published plans for a 'Blue Belt' – a network of large Marine Protection Areas (MPAs) enclosing 4 million km^2 of overseas territorial waters by 2020. The Blue Belt will become one of the world's largest enclosures for conservation, involving most of the UK's overseas territories. These territories accommodate over 90% of the UK's biodiversity, meriting 5 UNESCO World heritage sites and 15 Ramsar wetlands. While potentially desirable for conservation reasons, concerns are being raised about the integration of national security, and private sector interests, with marine conservation. The Blue Belt may also stand to undermine the biodiversity targets it aims to address. Many of the large MPAs do not offer protection

to the most threatened or biodiverse environments, favouring instead the least-threatened remote areas of ocean that are residual to commercial fishing. The social, political, and economic costs and benefits of these very remote MPAs are also yet to be determined. The paper reflects on a cross-scalar analysis of the Blue Belt, focusing on the South Atlantic territory of Saint Helena. Despite the territory's remote location, the paper exposes nuanced implementation challenges.

Two views for one region, wildlife and the Mexico-US border wall.
Rurik List. CBS Universidad Autónoma Metropolitana-Lerma, Mexico

The imaginary line marking Mexico and the US over millennia-old ecosystems became a physical barbed wire fence about 50 years ago. At that time, the grizzly, wolf and elk had been extirpated from the region, and today most large mammals of this area are at risk in either or both countries. Since 2009, 1050 km of the border have been changed to barriers permeable to wildlife or to wall variants impassable to many large mammals. Because of the wall, species like bison, pronghorn and bighorn sheep have fewer places to cross the border. If solid wall is expanded in biologically important areas, large mammals will be completely divided into north and south populations or will become extirpated. Effective conservation of the region's biodiversity requires recognising ecosystems as continuous units across the border. However, counteracting the border wall policy of the US government needs widespread public opposition, but news and social media in the US omit mentioning the effects to Mexican species, failing to foster the notion of binational interdependence. In Mexico the wall receives less media attention, is largely perceived as an US issue, and the Mexican government has not stated an officially policy about it.

Geopolitical Ecology
Session chair: Dominic Johnson, Department of Politics and International Relations, University of Oxford

Geopolitical ecologies: an analytical framework for biological conservation
Benjamin Neimark and Patrick Bigger, Lancaster University, UK

International financial flows for conservation increasingly include an element of 'cost recovery' or profit making for investors, multilateral banks, and/or aid agencies. While conservation is typically presented as the primary aim, by design or incidentally, they also produce effects falling outside the registers of 'economic' or 'environmental' (Asiyanbi 2018) and more often come with security infrastructure to protect investments. How might we theorize the confluence of financialisation, conservation, and increasing militarization? We elaborate a theoretical framework that integrates political ecology with geopolitics –'geopolitical ecology' (Bigger and Neimark 2018). Geopolitical ecology seeks a nuanced understanding of large geopolitical institutions' role in global environmental change. Similarly, geopolitical ecology helps better interpret how large institutions, like Big International NGOs (BINGOS) and banks, not generally considered geopolitical actors, come to behave as such. We explore synergies between political ecologists' careful attention to multi-scale environmental politics and the discursive-material co-constitution of global institutional geopolitics. Moreover, in doing so, we suggest that this framework could be used by to propose, develop and analyse the practices and processes of conservation geopolitics pursued through profit-seeking capital flows in specific case studies including wildlife trafficking, marine and terrestrial protected areas, marginalisation and loss and damage due to conservation encloses.

Encountering the border: geopolitical ecologies of sturgeon conservation
Hannah Dickinson, University of Sheffield, UK

Sturgeon are the most critically endangered group of species (IUCN, 2010) and have been driven to near extinction as a result of the global demand for their caviar. Given the geographical distribution of wild sturgeon in rivers and seas that intersect international boundaries, efforts to conserve sturgeon have subsequently become entangled in complex scenarios that fall under the rubric of "Conservation Geopolitics". Borders and

boundaries are inherently geopolitical, playing a central role in geopolitical thought and practice. Moreover, borders pose numerous questions and challenges for conservation, and conservation is said to 'animate' borders (Ramutsindela, 2015). As such, the paper utilises 'borders' as a heuristic device to consider the 'Geopolitical Ecology' of sturgeon conservation. The paper considers how 'the border' is variably encountered by both human and nonhuman actors via efforts to conserve and secure sturgeon populations. Conceptualising borders in their multiplicitious forms - as physical objects; as a practice; and as metaphors - the paper makes the case that conservation of sturgeon both creates borders, and is impeded or challenged by borders. Interrogating these border dynamics - of creation and restriction - is revealing of ecologies of multi-species (geo)political encounter, that extend far beyond the ostensible aim of sturgeon conservation.

The political ecology of transboundary conservation in northern Rwanda

Shane Mc Guinness, Trinity College, Dublin, Ireland

Northern Rwanda is no stranger to instability. Lying in a region of vast mineral wealth and fertile volcanic soil, it is also one of the most densely populated regions in mainland Africa. Volcanoes National Park (VNP), as part of the Virungas Transboundary Protected Area, is rich in unique biodiversity and provides most of Rwanda's foreign revenue through tourism. This park is also a tri-state nexus (Rwanda; Democratic Rep. of the Congo; Uganda) and cultural crossroads, with borders crossing a string of high peaks. As part of a larger assessment of human-wildlife conflict around VNP, this paper focuses on the political ecology of conservation in VNP and assesses the role of the Rwandan government, international donors and multinational agro-industry in priming conflict and potentially perpetuating instability. Through a series of interviews, focus groups and direct field observations, this study also discovered the role of VNP as a transboundary conduit for minerals and as a route for military traffic into the DRC. This study has, in particular, uncovered a worrying trend towards reduced autonomy of land use and increased impacts on existing marginalised communities. I further contend that the 1994 genocide continues to influence this political ecology, in providing justification for Rwanda's military activities within North Kivu, DRC, using mountain gorilla conservation and tourism revenue as effective political leverage. Recent rebel incursions into Rwanda stand to justify this control, while Rwanda's possible support for rebel groups in the DRC may strengthen this presumed validation.

Transnational diplomacies of knowing nature

Jasper Montana, University of Sheffield and University of Oxford, UK

Transnational issues, such as biodiversity loss, are increasingly governed in international forums. These 'global' spaces are not only sites for traditional geopolitical negotiations, they are also spaces in which the social contract between science and society is rewritten in order to transcend the bounds of the nation state. Here, geopolitics goes beyond issues of trade and treaties to consider the negotiated value systems that define claims to truth and authority in democratic societies. This paper examines two international forums in which knowledge of nature and the nature of knowledge are both under negotiation: The first, an expert committee for fisheries in the European Union, and the second, a global expert body for biodiversity in the United Nations system. In both forums, expert representatives act as negotiators, tasked with mediating divergent perspectives and shaping shared meanings. Applying theory from human geography and science and technology studies, this paper examines how the act of negotiation and agreement in these forums reconfigures the social contract. It examines how experts are implicated in diplomatic practices between the scientific and the political, the local and the global, and real and imagined futures. The conservation of biodiversity is a transnational issue that involves many geopolitical encounters. The transnational diplomacies of knowing nature are an often hidden, but important site of conservation geopolitics.

Transgressing and dissecting the Chernobyl exclusion zone: roaming radioactive wolves
Jonathon Turnbull, University of Cambridge, UK

In the 32 years since the worst nuclear disaster in history, the Chernobyl Exclusion Zone has paradoxically emerged as one of Europe's largest truly wild sanctuaries at 1,600 square miles and is now home to a range of species, including a population of wolves seven times greater than in surrounding uncontaminated nature reserves. The Zone extends from Chernobyl in Ukraine into Belarus. In the context of the ongoing Ukrainian civil war, the Belarusian government has begun demarcating a border between Ukraine and Belarus that intersects the Exclusion Zone. The border not only demarcates the two countries but also marks two different approaches to managing the Zone, including its wildlife as it continues to emerge: the Belarusians favour a traditional fortress conservation approach whilst the Ukrainians are encouraging as much tourism as possible. The wildlife in the area, however, does not adhere to borders. This paper will highlight how the agency of animals in conservation spaces can render borders inert. To highlight this, it will take the case of a young male wolf that was recently tracked leaving Chernobyl, causing the media and some scientists to react with alarm as reports of 'radioactive mutant wolves' were spreading 'mutant genes' across Europe.

THURSDAY 21ST MARCH

Conservation Across Borders 1
Session chair: Mohammad Farhadinia, Oxford Martin Fellow, WildCRU, Zoology, University of Oxford, UK

Across the Iron Curtain: transboundary research on Eurasian lynx ecology facilitates cooperation between countries
Marco Heurich, University of Freiburg, Germany, Elisa Belotti, Ludek Bufka and Bernhard Malkmus

The Bavarian Forest and Šumava National park together with adjacent protected areas and public lands form one of the largest strictly protected landscapes in Central Europe, collectively known as the Bohemian Forest Ecosystem. 30 years ago this unique landscape was bisected by the iron curtain, which prohibited any cooperation. After the end of the cold war the border fence was removed and Šumava National Park established. A landmark study which facilitated cooperation between the two parks was the transboundary research on the ecology of Eurasian lynx, a far ranging species which needs vast tracts of land. Efforts to coordinate snow tracking and exchange important information have been made since the 1990s, but from 2005 onwards a common project using GPS telemetry and camera traps was funded by European Union. To successfully run the project a tight collaboration and the need to overcome administrative and cultural barriers was necessary. Moreover a system of long term monitoring, data exchange and tight cooperation between both national parks' staff was established and continues to date. The case study created a new awareness about the need that both parks and the adjacent landscapes have to be managed as one transboundary ecosystem. It also pointed to the challenges imposed by new threads in the era of the Anthropocene.

Achieving conservation across boundaries: the Kenya-Tanzania borderland
Peadar Brehony, University of Cambridge, UK and Peter Tyrrell

Ecosystems and the wildlife which depend on them, do not recognize the boundaries that we have created. Conservation beyond protected areas and across regional and national boundaries remains a challenging task. The Kenya-Tanzania borderland sustains the world's most intact migratory populations of large herbivores, a large free-ranging elephant population, one of the richest large carnivore populations, and high bird and plant diversity. These are all partly protected through a constellation of protected areas either side of the Kenya-Tanzania border. Despite the significant conservation coverage, wildlife is declining in protected areas, and at rates similar to non-protected areas. The reasons for this are no different to those which threaten the pastoral economies of the people who live in the rangelands across the borderland: landscape fragmentation; sedentarisation; and a lack of wildlife value. However, when these challenges are tackled, from a livelihoods

first perspective, or inside-out, pastoralist communities are committed to conserving these ecosystems and consequently, their wildlife. We describe how using an inside-out approach in a pastoralist community in southern Kenya has been achieved, and how this has expanded to overcome regional and national boundaries, by matching the ecological and social scales of governance and cooperation. The approach relies on sustaining open rangelands for pastoralists, and in doing so, winning space for wildlife, and building resilience to shocks, such as drought and climate change, for both people and wildlife.

The geopolitics of wilderness: challenges in protecting pristine nature and the prospects of convivial conservation in Europe

George Iordachescu, IMT School for Advanced Studies Lucca, Italy

One of the biggest challenges conservation faces today is the protection of pristine nature to ensure the study of climate adaptation, education for sustainable development and recreation. European governments, transnational NGOs and academic communities tried to negotiate a common frame for wilderness protection across Europe. Much energy has been invested in advocating for the opportunity to rewild key landscapes, to identify and declare wilderness areas and to push for strict protection of pristine forests. The European Green Belt Initiative, the extension of the trans-boundary UNESCO property Ancient and Primeval Beech Forests or the recent Endangered Landscapes Program, are all examples of multi-national efforts towards this common goal. However, a political consensus seems hard to achieve yet. The high degree of landscape fragmentation, the cultural richness of historical landscapes, the propensity to under-develop peripheral rural areas and the tendency to inflict environmental injustice upon traditional land users, are all issues raised by critics of wilderness conservation studying the process across the continent. Drawing on political ecology the present paper analyses the strengths and weaknesses of different European approaches to wilderness and advocates, using ethnographic data, for a necessary switch toward convivial conservation aiming to conciliate both traditional ecologic knowledge(es) survival and sustainable development goals.

Big cats and border politics: the status of jaguar conservation in the United States

Christopher Bugbee and Aletris Neils, Conservation CATalyst and Humboldt State University, USA

Jaguars are the largest felid in the New World and historically ranged throughout the southwestern United States. While effectively removed by government-funded predator eradication campaigns north of the U.S.-Mexico border in the first half of the 20th century, individual jaguars still periodically disperse out of Sonora, Mexico and occupy mountainous regions of Arizona and New Mexico. Although jaguars are listed as endangered, all individuals documented in the U.S. in recent years have been male and are thus considered "vagrants" not essential to the core population in Mexico. The result is a complete lack of state and federal funds and efforts to manage these imperilled cats. Though currently threatened by poaching and habitat loss through mining and development, jaguars, like several other Neotropical mammals, may be expanding their range northward. However, the highly politicized border fence creates a geopolitical barrier that, if finalized, would completely and permanently prevent jaguars from recolonizing their former range in the United States. To save the northern jaguar, international collaboration is required to protect the breeding population in Mexico and conserve habitat and corridors on both sides of the international border. Considering the current political climate, is recovering the charismatic northern jaguar possible?

Neighbours across the river: conservation challenges at the Peru-Brazil border

Lyndsie Bourgon, National Geographic Early Career Explorer

The Rio Acre is a fluid borderline, stitching together Peru, Brazil, and Bolivia. In Peru's Madre de Dios, the indigenous Gine community of Belgica can see clear across the river to Brazil's Amazon. In their forest eco-concession, community leaders struggle with the presence of Brazilian poachers that take wildlife and artifacts, floating them across the river to sell in the markets of Assis. In this, Belgica experiences the immediate challenges of conservation at the frontier – loopholes in transnational law, and international

demand that trumps indigenous cultural significance. In spring 2018, I travelled Peru's Amazon to collect indigenous oral histories of wildlife poaching and illegal logging. I argue that these oral histories show a holistic understanding of poaching on-the-ground. This was most evident in Belgica, where conservation law is essentially ignored.

Conservation Across Borders 2
Session chair: Cosmin Corendea, Jindal Global University Law School, India

Big cats in borderlands: challenges and implications for trans-boundary conservation for Asian leopards
Mohammad Farhadinia, University of Oxford, UK, Susana Rostro-García, Limin Feng, Jan Kamler, Andrew Spalton, Elena Shevtsova, Igor Khorozyan, Mohammed AL-Duais, Jianping Ge and David Macdonald

Large carnivore populations have extensive spatial requirements, which often result in ranges that span geopolitical borders. Consequently, management of transboundary populations is subject to different political jurisdictions, often with high heterogeneity in conservation challenges and efforts. In continental Asia, there are one Endangered and three Critically Endangered leopard subspecies with transboundary populations spanning 23 countries: the Persian, Indochinese, Arabian, and Amur leopards. We reviewed the status of these subspecies and examined their conservation challenges and opportunities. Amur and Indochinese leopards had a majority of their remaining range in borderlands, whereas Persian and Arabian leopards had a quarter of their remaining ranges in borderlands. Overall, in 18 of 23 countries the majority of the remaining leopard range was in borderlands, thus in most countries their conservation is highly dependent on transboundary collaborations. However, we found only two transboundary initiatives for leopard conservation across the continent. Overall, we identified three key transboundary landscapes in politically stable regions which are of high importance for the survival of these subspecies. Recent listing of leopard in the Appendix II of the Bonn Convention is an encouraging step forward, but more international attention and collaboration is needed to save these subspecies. Our paper provides a spatial framework on which Asian range countries and international agencies can establish transboundary cooperation for the conservation of endangered leopards.

Assessing the decline of Punjab Urial (*Ovis vignei punjabiensis*) and its conservation outcomes
Maria Neelum, Asma Jabeen and Arooj Fatima, Fatima Jinnah Womens University, Pakistan

The Punjab Urial (*Ovis vignei punjabiensis*) is endemic to northern Punjab and is classified as endangered. Threats faced include poaching of lambs, hunting, habitat destruction and competition with livestock. This study identifies correlation of factors causing their decline and evaluates the gaps in conservation practices. GIS and RS are used to visualize the data. From the top-down perspective, the Punjab wildlife Act, 1974 (protection, preservation, conservation and management) is being followed by establishment of the Punjab Wildlife Protection Department, Wildlife Conservation Society and the Wildlife and Parks, Punjab, who are investing in conservation of Urial through practices like trophy hunting of which 80% is allocated for the community organizations. Trophy hunting attracts foreigners and huge sum of money to widen conservation practices. From the bottom-up perspective, community interest and engagement in wildlife conservation has led to the development of five community based organizations (CBOs) who are helping in raising the number of Urial's hence improving socio-economic conditions of people.

Climate change impacts on terrestrial biodiversity: exploring projected changes in a human context
Mark Titley, Durham University, UK

Climate change is set to bring major disruption to ecosystems this century. In particular, it is expected to alter the distributions of species worldwide as they track their shifting climatic niches. However, the implications of this redistribution for conservation remain unclear, and are yet to be explored in a sociopolitical context. Here, using ensemble species distribution modelling for the world's terrestrial mammals and birds, we predict significant shifts in the distributions of species climatic niches, and explore these projections in the

context of national-level sociopolitical data and political boundaries. Countries with lower carbon emissions, lower governance, lower wealth and higher corruption are projected to suffer the greatest losses in bird and mammal richness. Therefore, the countries that contributed least to climate change themselves, and which may be least well equipped to mitigate its impacts, may be faced with the greatest biodiversity losses. In addition, we consider the implications of modelled changes to species distributions for transboundary conservation. Our results underscore the usefulness of considering sociopolitical factors in biodiversity research and highlight international inequities in the impacts of climate change on terrestrial biodiversity.

Assessing policy implementation using the social-ecological systems framework, one size does not fit all
Peter Tyrrell, WildCRU, Zoology, University of Oxford, UK

In the process of developing new conservation policies it is vital to acknowledge and learn from the successes and failures of policies in other countries. Conservation of savannah ecosystems in Africa, for example, often encourages the sharing of practices and policies adopted in Southern Africa countries with countries in east Africa. However, when implementing or importing new conservation policies, it is vital that we acknowledge the regional differences that exist in both the ecological and social realms. The nature of wildlife, and other natural resources, is that they are part of social-ecological systems, where interconnections between humans and nature can be multi-faceted and highly complex. If we do not explore the full suite of factors determining the success or failure of conservation actions, and prepare for unexpected challenges, we may fail in our conservation goals of achieving outcomes that benefit both nature and people. Ostrom's (2009) Social-Ecological Systems Framework (SESF) is an adaptable yet structured approach for understanding the processes that lead to the deterioration or improvement of natural resources, using a systems-based approach that aims to treat ecological and social components equally. Despite the frequency of use of the social ecological systems language, few conservation planning and policy initiatives have implemented the SES framework to assess the consequences of conservation actions. We apply the SESF to explore the barriers to the implementation of a policy on the sustainable consumptive utilisation of wildlife in Kenya, a policy regarded as being a successful tool for conservation in several southern African countries - focusing on the trade of wildlife and the sale of game meat. Using the framework, we identified seven overarching barriers, ranging in severity, to the implementation of the consumptive utilisation of wildlife in Kenya, which cross both social and ecological systems. The SESF appears to be a robust framework in determining the barriers to implementation of conservation policy, accounting for differences that appear within different social ecological systems. We highlight that this shortcoming is a common problem when attempting to replicate conservation policies and actions across countries.

Using fine spatial resolution satellite imagery to monitor elephants across national borders
Isla Duporge, WildCRU, Zoology, University of Oxford, UK

Elephants are under pressure in the majority of the range states where they live; poached for their ivory, trafficked into highly lucrative illegal markets in Asia or killed as a result of human-wildlife conflict in retaliation for crop raiding and trampling community members. With an increasing human population, more land is being used for agricultural production and human settlement, the area where elephants can freely roam is contracting and as a result human-wildlife conflict is on the rise. There are several techniques used to deter elephants from cropland and human inhabited areas including the use of chilli fences/bombs, bee fences and a number of technological solutions designed to act as an early warning system for communities. To find long-term sustainable solutions to this problem it is necessary to have data on elephant numbers and geographical range areas so as to identify high risk areas. There are a wide range of methods used to conduct elephant occupancy and abundance surveys including line transects, aerial surveys, camera trap surveys and spoor and track counts each with their own challenges. One unexplored area of research is the use of fine spatial resolution satellite imagery. This talk will describe the research I am carrying out to develop a new monitoring system for elephants in the range states where they are at threat from illegal poaching. The rate at which

satellite technology is progressing provides unprecedented opportunities to survey wildlife, knowing where species are is vital to protecting them especially wildlife that is highly vulnerable from the illegal wildlife trade.

Infrastructure, International Development, and Conservation
Session chair: Samuel Cushman, Director of the Center for Landscape Science, U.S. Forest Service, USA

Estimating the impact of planned infrastructure projects on chimpanzees in West Africa
Stefanie Heinicke, Max Planck Institute for Evolutionary Anthropology, Germany, and multiple colleagues

Large-scale land-use change driven by expansion of human-modified landscapes resulted in more than 80% forest loss since 1900 in West Africa. New projects such as the planned "development corridors" consisting of roads, rails, and pipelines, which also aim to expand agriculture and settlements, are likely to further accelerate wildlife decline. To support the update of the conservation action plan for the critically endangered western chimpanzee, we estimated the effect of these developments on this taxon. We modelled western chimpanzee density distribution based on surveys compiled via the IUCN SSC A.P.E.S. database and identified areas of low population connectivity. We found that chimpanzee strongholds remain at the transboundary areas of Guinea/Guinea-Bissau/Senegal and Sierra Leone/Liberia. Moreover, 10% of chimpanzees will be within 25 km of the "development corridors" and they would intersect low population-connectivity areas at the Guinea/Liberia/Sierra Leonean border. We estimated that 30% of chimpanzees are already living within 5 km of settlements. If implemented, the "development corridors" are likely to cause further habitat loss, impede population connectivity, and have secondary effects, e.g., increased bushmeat hunting and human-wildlife conflicts. While this study focuses on chimpanzees, identifying areas of conservation concern for this charismatic flagship species can raise attention for necessary mitigation measures, which once implemented would also be beneficial for sympatric species.

How the geopolitics of transport corridors are shaping conservation futures in sub-Saharan Africa
Charis Enns and Brock Bersaglio University of Sheffield, UK

The world is experiencing one of the most explosive eras of infrastructure development in history. As the global economy expands ever further into new frontiers of commodity and energy production, demand for new and improved transport infrastructure has skyrocketed. This transport infrastructure boom is particularly notable in sub-Saharan Africa, where vast networks of railways, roads, and pipelines are being constructed to open isolated parts of the continent for investment. A growing body of academic literature claims that these 'transport corridors' are fuelling environmental degradation, habitat fragmentation, and the illegal wildlife trade. Yet, such claims largely overlook the fact that transport corridors are also paving the way for new investments in eco-tourism, protected areas, and renewable energy. In this paper, we examine this seemingly paradoxical trend of transport corridors simultaneously driving both the degradation and conservation of the environment. Specifically, we consider the types of conservation futures emerging as the geopolitical interests of different global actors – e.g. Chinese investment in infrastructure and British investment in conservation – come into contact with each other along transport corridors in sub-Saharan Africa. Our analysis is based on research carried out along transport corridors in Cameroon, Kenya, Tanzania, and Zambia between 2014 and 2018.

Evaluating impact of major developments in Myanmar on clouded leopard connectivity and population dynamics
Zaneta Kaszta, WildCRU, Zoology, University of Oxford, UK, Samuel Cushman and Saw Htun

Changes in land use/cover are the main drivers of global biodiversity loss, and thus tools to evaluate effects of landscape change on biodiversity are crucial. However, landscape-level approaches are not widely implemented by planning agencies, mainly due to lack of extensive species-specific data, complexity of

ecological guidelines and lack of integrated protocols which would increase their usability. In this study we integrated spatial statistics, landscape ecology and landscape genetics into a GIS-based methodological framework, to evaluate impact of potential major developments in Myanmar on landscape connectivity and population dynamics of clouded leopard in Myanmar. The framework was based on a clouded leopard multi-scale habitat suitability model developed from an extensive dataset of 44 camera trap grids located in 8 countries in Southeast Asia. Using cumulative resistant kernel and factorial least cost path approaches together with individual-based spatial population genetics models, we quantified and mapped the impacts of five development scenarios: construction of 53 dams, the Chinese One-Belt-One Road initiative, a pipeline/railway spanning the country, the Indian Highway, and the growth and establishment of economic and touristic zones. We found that all investigated scenarios have negative effects on clouded leopard population dynamics and landscape connectivity, often disconnecting the most important clouded core habitats in the whole of SE Asia. However, growth of cities and establishment of new economic zones caused disproportionally the highest loss and extensive fragmentation of clouded leopard habitat (23.5% decrease in the sum of cumulative kernel values representing strength of landscape connectivity and 62% decrease in the area-weighted extent of the clouded leopard core habitats). Our study was based on clouded leopard in Myanmar, however, this framework can be applied to any landscapes, ecosystems and species/set of species.

Biodiversity hotspots in the Anthropocene: assessing multi-species – habitat relationships in Southeast Asia

Luca Chiaverini, WildCRU, Zoology, University of Oxford, UK

Global biodiversity is facing a period of threats and decline comparable with the five previous mass extinctions of Earth's history. Southeast Asia's biodiversity is one of the most endangered worldwide by a suite of anthropogenic threats such as deforestation and habitat loss. Habitat suitability studies should undergo a paradigmatic switch from single-species to multi-species approach to be effective for biodiversity. We applied a multi-species, multi-scale framework to investigate community-habitat relationships in Southeast Asia, using the richest camera-trap data set collected to date in the region. We applied multivariate techniques to highlight the main habitat features associated with communities and performed variance partitioning to find their contribution in driving species occurrence. We tested alternative techniques to find the best method to model species richness and produced habitat suitability maps highlighting the biodiversity hotspots in the region. We demonstrated the importance of untouched forested areas to preserve biodiversity in Southeast Asia. Overall, environmental and anthropic features have higher importance in driving species occurrence than topographic and spatial features. Nonetheless, GAP analysis showed that a small percentage of the biodiversity currently occurs within protected areas. Hence, proactive management plans have to be applied to avoid loss of suitable habitat in these biodiversity hotspots.

Conservation Ethics 1

Session chair: John Vucetich, Michigan Technological University, USA

Conservation publications and their provisions to protect research participants

Harriet Ibbett University of Oxford and Bangor University, UK, and Stephanie Brittain, University of Oxford, UK

As global interest in Illegal Wildlife Trade (IWT) grows, so too does the need for robust information about the perpetrators of wildlife crime. Often this involves using social research methods to collect information from, and about people. While there is increasing recognition of the ability of the social sciences to benefit conservation research, conservation has been criticized for poor social science research practice, and for publishing low-quality social science in high-impact journals. One particular critique applies to the lack of ethical rigor applied during conservation research that involves human participants. Here, we present results of a systematic review of conservation journal articles, where we investigated the ethical safeguards authors reported implementing to protect human participants during research. We used hunting of wildlife by local

people as a case study to 1) review the guidelines journals offer to authors, and the ethical standards journals required authors to report on in publications, 2) describe the types of safeguards and ethical considerations reported by authors, and 3) infer the extent to which reporting in conservation studies adheres to currently accepted standards for human research ethics. We identified a significant mismatch between journals policies and their publication practice, and found ethics were often poorly described by authors, with insufficient detail to determine the quality of the safeguards implemented. Our findings are pertinent as once published, articles become reference points both for the development of future research, and ethical research behavior. Insufficient ethics reporting risks perpetuating poor research practice and may compromise the rights of research participants.

Free-roaming dogs and their impact on biodiversity worldwide.
Cristian Bonacic, Pontifical Catholic University of Chile, and Tara Martin

Rural and City divide is widening the gap between people who decide what to do about free-roaming dogs and their impact on biodiversity worldwide. Impacts of free-roaming dogs on biodiversity are increasing worldwide. Their impacts are most pronounced in rural areas, yet decisions about how to manage free-roaming dogs are being driven by values from those living in urban areas. A conflict of values and perceptions is increasing as more people live in large cities than any time in human history and impose their perceptions and values on rural areas. We examine the ethical, ecological and social consequences of policies, campaigns and actions that prevent the control of free-roaming dogs in rural areas worldwide. We present examples of extreme cases of policies driven by no-euthanasia principles that are preventing rural communities' ability to confront an emerging threat to their livestock and wildlife in Chile and elsewhere. We propose that animal welfare principles based on the protection of individual well-being should take into account the impact of dogs on the local biodiversity, environment, human and livestock health and economies. Animal welfare priorities should be combined with social-ecological approaches and conservation priorities to involve stakeholders from rural areas, as well as from cities to develop policies for combatting this growing global issue.

Unintended consequences: how the animal rights movement inadvertently increased persecution of Namibian carnivores
Aletris Neils, Conservation CATalyst and Humboldt State University, USA

Renowned for its incredible assemblage of native fauna, Namibia also has a long history of commercial farming with domestic livestock. Depredation by local predators and associated control responses by farmers is a growing concern amongst conservationists and agriculturists alike. To enhance understanding of these multifaceted wildlife conflicts, predator ecological data was integrated with 561 qualitative interviews of Namibian stock farmers to identify underlying reasons for these hostilities. Results indicate that ultimate drivers of wildlife conflicts included a market-driven shift from pelt to mutton breeds, whose husbandry and management strategies inherently led to increased problems with predators. This change was precipitated by international animal rights campaigns beginning in the 1970s that led to a crash in the once profitable market for Karakul lamb pelts, as utilizing neonatal hides brought the industry under attack by the anti-fur movement. Ironically, these campaigns inadvertently triggered a significant increase in the number of native carnivores, such as caracal, cheetah, leopard and jackal, killed as backlash over conflicts. This research illustrates that actions from well-intentioned citizens in the Western world can create ripple effects that result in cascading ecological consequences for people and wildlife on the other side of the globe.

Ending consumptive use of terrestrial wildlife
Andrew Rowan, WellBeing International, USA

It is now widely accepted that terrestrial wildlife is in a perilous state across the globe with terrestrial wild mammals now accounting for only 4% of global mammalian biomass. Despite this, humans continue to engage in traditional consumptive uses of wildlife including the hunting of bush meat and the trophy hunting

of charismatic species by a few wealthy individuals. While the income derived from trophy hunting has supported the development and continued operation of some wild space that is restricted largely to wild animals, permitting a global elite (in terms of wealth) to hunt a few trophy animals sends the wrong message to those living in the source countries. This talk will examine ethical, economic and political arguments for and against hunting and all consumptive uses of terrestrial wildlife and argue that we are now at a point (the Anthropocene) where political leaders should build a consensus towards a complete cessation of activities involving the lethal consumption of terrestrial wildlife.

Moral tribalism in global conservation governance: implications for African megafauna
Michael 't Sas-Rolfes, University of Oxford, UK

Several African countries actively promote the commercial harvesting and trade of wildlife as a conservation tool. However, recreational trophy hunting and the trade in body parts of certain charismatic megafauna is a hotly contested policy issue, causing deep divisions within institutions of global governance such as the Convention on International Trade in Endangered Species (CITES). These divisions are driven in part by uncertainty and differing opinions over the complex interactions of legal and illegal trade in endangered species and consequent impacts upon conservation. They are also driven in part by conflicting value systems and associated ethical stances relating to endangered species trade. Drawing upon insights from moral philosophy and social psychology, and applying these to three years of accumulated qualitative data, this paper examines the extent and influence of 'moral tribalism' in CITES policy processes. With a specific focus on three charismatic species (lions, rhinos and elephants) it further outlines the known and potential consequences of closing legal markets for harvested products. Finally, the paper considers whether ongoing policy conflicts over these issues may be effectively resolved for the benefit of conservation through participatory processes and compromise; or, alternatively, whether irreconcilable differences in underlying value systems preclude any workable solutions.

Violent Human Conflict and Conservation
Session chair: Rosaleen Duffy, University of Sheffield, UK

Conservation in a zone of lawlessness and insurgency: the Mali Elephant Project
Susan Canney, Department of Zoology, University of Oxford, UK

This presentation will describe a model of conservation that has enabled the persistence of a small, yet internationally important, remnant elephant population in the northern Sahel of Mali, despite lawlessness, environmental degradation, poverty and war. Achieving this required weaving together multiple disciplines (including ecology, socio-economics, development anthropology, political ecology, policy) to engage local grass-roots communities in co-creating solutions that enable humans and wildlife to thrive together over a vast, remote, unprotected area, the size of Belgium and Luxembourg combined. The result proved robust to the conflict, lawlessness and insurgency that has plagued the region since 2012, because it addresses some of the core drivers of violent extremism, and was further developed to cope with the new phenomenon of elephant poaching. After an initial improvement following French air-strikes in 2013, the security situation has continued to deteriorate since 2015, with international traffickers profiting from the chaos. Despite this, it has been possible to mobilise a government anti-poaching enforcement response to support local efforts. This experience will be presented in such a way as to contribute to the debate surrounding stabilisation in this area.

Cultures of nationalism: conservation, insurgency and ethnic violence in the Manas Tiger Reserve, India
Trishant Simlai, University of Cambridge, UK

Multiple armed insurgencies and questions over identity continue to destabilize the state of Assam in India's northeast. Conservation practice is increasingly under pressure to adapt and adjust to the changing socio-political narratives on the ground in this region. The Manas tiger reserve in Western Assam on the border with

Bhutan is recovering from a decade long organized insurgency that resulted in a peace accord between the Government of India and a militant group called the Bodo Liberation Tigers (BLT) claiming to represent the largest indigenous community in the region called the 'Bodos'. Before the peace accord and during the peak insurgency period, conservation narratives focused on forest degradation by the 'Bodo' people, large scale poaching by armed Bodo insurgent groups of and local extinctions of large charismatic species like the Indian one horned rhino. However post-accord, the narratives have changed considerably and now focus on forest degradation and poaching by non-Bodo ethnic minorities and the perceived 'illegal immigrants' of the region. This has led to multiple violent evictions, sporadic ethnic violence and even use of racist interventions. Drawing on 8 months of ethnographic field research this paper attempts to explore and deconstruct the dominant conservation discourse pre and post the peace accord. It demonstrates how and why the discourse significantly changed and how conservation practice is shaped through the changing power equations on the ground and the broader conflict dynamics evolving around ethnicity, identity and citizenship.

Conservation's geo-ethno-politics: saving Kachin Country or Northern Forest Complex in war-torn Burma?

Laur Kiik, University of Oxford, UK

How do conservationists save nature amid national autonomy movements, unrecognized countries, and ethno-political wars? When is conservation's geo-politics its ethno-politics? Based on altogether twenty months of ethnographic fieldwork between 2010 and 2019, this paper explores the encounters between an ethnic national movement and international nature conservation – in the sub-Himalayan Kachin region of northernmost Burma between India, Tibet, and China. The Kachin borderland suffers from decades of military repression, a billions-worth grabbing of natural resources, and a current war that has displaced over one hundred thousand people. This biodiversity hotspot also hosts vast ancient rainforests and diverse life-forms that have drawn major Western conservation organisations there to develop "the world's largest tiger reserve," a proposed UNESCO world natural heritage site, a biosphere reserve, and several other protected areas. "Geo-ethno-politically," these Western and Burmese conservation practitioners mostly cooperate with Myanmar's military-state, controlled by the country's lowland ethnic majority. Yet, they also encounter Kachin ethnic patriots, for whom here is not Burma's great Northern Forest Complex, but a separate nation's rightful homeland. Indeed, several ethnic national movements contest this landscape. How do conservationists understand and engage nations beyond "the international community"?

Nature abhors a (legal) vacuum: the protection of wildlife in armed conflicts

Elke Hellinx, KU Leuven, Belgium

Although armed conflicts often directly and indirectly affect wildlife, the 'law of armed conflict' only offhandedly regulates wildlife protection. While the existing legal framework does establish some mechanisms that aim to protect wildlife during armed conflict, these have not proven successful in practice. For one, whereas most armed conflicts today are in fact *non-international* armed conflicts (NIACs), the bulk of the existing protective legal framework only explicitly applies to *international* armed conflicts. In consequence, NIACs generally remain a legal vacuum when it comes to wildlife protection. To make matters worse, state institutions, including those responsible for wildlife management, are usually fundamentally disrupted during a NIAC. Such disruption is a major impediment to preventive management and effective enforcement by the state. In this presentation, I explore the existing legal framework for the protection of wildlife during NIACs in order to identify and shed light on the gaps and deficiencies in this system. I also investigate how the international community can assist states that are engulfed in armed conflict with the implementation of functional wildlife management structures.

Conservation and livelihoods

Session chair: Alexandra Zimmermann, IUCN and WildCRU, Zoology, University of Oxford, UK

Snow leopard friendly pashmina – converging traditional livelihoods, culture and wildlife conservation

Abhishek Ghoshal, Nature Conservation Foundation, Mysuru-Bengaluru, India

Commercial pashmina/cashmere production practices have decimated wild-ungulates across Central Asian mountain ecosystem. Traditional herder communities of the Indian Changthang (22,000 km^2) produce 40,000 kgs cashmere annually, contributing 1% of global cashmere. Recently, the Indian market was opened to import industrially produced Mongolian and Chinese cashmere, improving regional trade relationship. Amidst this asymmetric competition the Indian herder communities are increasing goat populations to boost production and income. This is leading to out competition of wild-ungulates and increasing livestock depredation by threatened wild-carnivores, e.g. snow leopards and wolves. We are experimenting with a community-based conservation model, Snow Leopard Friendly Pashmina (SLFP), to make grazing practices more biodiversity friendly such that the cashmere is certified 'snow leopard friendly', fetching additional income to herders for supporting conservation. Through SLFP, partnering with regional administration and 178 herders with 56,000 livestock across five villages and two nomadic communities, we are strengthening livelihoods of herders by mitigating biodiversity-related livestock losses and value-addition to livestock products; managing pastures for wild-ungulate conservation; preventing hunting/trapping of wild-carnivores; and reviving cultural practices. In a geo-politically dynamic Central Asia and the Indian subcontinent, SLFP model can be scaled to large landscapes with multiple stakeholders to improve commercial livestock production systems alongside wildlife conservation.

Tourism and wildlife consumption

Jessica Bell Rizzolo, Michigan State University, USA

Tourism is one of the primary mechanisms for interaction with other cultures and with wildlife. Globally, wildlife tourism is valued at US $45 billion, with an annual growth rate of 10%, and is expected to proliferate further with increases in global education and income (Newsome & Rodger 2013). Although tourism does have the potential to promote conservation and bolster local economies, it can also yield negative sociocultural outcomes, harm wildlife, and facilitate conservation crime. Tourists are often unable to accurately perceive the conservation impacts of their actions (Moorhouse et al. 2015). However, with the exception of Duffy (2010), the intersection of wildlife tourism and consumption has been understudied. In this presentation, I use survey data from 12 countries (N= 12,000) to examine how geographic context and participation in wildlife tourism intersect in their influence on wildlife consumption. For China, Thailand, India, Great Britain, Australia, Canada, Brazil, and the United States, there was a significant correlation between tourism participation and consumption of wildlife products. However, effects differed by type and location of tourist venue. For China, India, Australia, and Canada, eating or drinking wildlife products was correlated with riding an elephant abroad (but not riding an elephant at home). For the United States, there was a significant correlation between purchasing wildlife product souvenirs and riding an elephant abroad. Implications for wildlife tourism policies and wildlife crime prevention are discussed.

Wildlife, conservation, sustainable development, and policy coherence

Francis Vorhies, Stellenbosch University, South Africa

Over the last decades, the place of wildlife and the role for conservation in international sustainable development policy have changed. The recognition of wildlife as a key factor in sustainability declined and then rebounded somewhat. The meaning of conservation changed significantly leading to much less clarity regarding the management of nature in the context of sustainable development. This paper explores the concepts of wildlife, conservation, and sustainable development in two key multilateral agreements and two key multilateral strategies which were developed and launched over the last half century. These are the 1975

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the 1980 World Conservation Strategy (WCS), the 1992 Convention on Biological Diversity (CBD), and the 2015 2030 Agenda for Sustainable Development. It questions whether there is a place for wildlife in sustainable development; whether we need to rethink what we mean by conservation, particularly conservation of wildlife, in this context; and whether the outcomes of the most recent 14th Conference of the Parties of the CBD are moving us in a direction where wildlife conservation will be part of the future we want.

Natural capital market design
Alexander Teytelboym, University of Oxford, UK

Renewable natural capital—terrestrial and marine ecosystems, fisheries, biodiversity, and groundwater—is in decline around the world affecting livelihoods of millions of people. Natural capital market design uses economic theory and analysis to develop practical solutions for maintaining, restoring, and improving natural capital. Many successful natural capital marketplaces (e.g. for emissions reduction, fish harvesting, and wetland restoration) focus on efficient trading of property rights. But many other natural capital markets (e.g. carbon sequestration offsets, water quality, and groundwater abstraction) are characterised by heterogeneity and high transaction costs that make trading difficult. We argue that in order to fix many natural capital market failures policymakers should instead pay more attention to the initial allocation of property rights: this is particularly crucial in many markets for ecosystem services (e.g. biodiversity conservation and watershed protection) which exhibit ecological complementarities. We propose several promising designs for natural capital market-places which could fairly and efficiently allocate property rights over different ecosystems.

FRIDAY 22nd MARCH

International Environmental Law
Session chair: Catherine Redgewell, Chichele Professor of Public International Law, University of Oxford

Reforming the (ab)use of science in law: methods for communicating science to improve legal decision making
Yaffa Epstein, Uppsala University, Sweden

Terms originating in the natural sciences permeate the law. This is especially true in environmental law, which regulates human interaction with the natural world. Differing interpretations of terms such as species viability or favourable conservation status in different disciplines affect decision making and make it difficult to ascertain whether the law is being complied with. When scientific concepts are made part of the law, reference to the natural sciences is often necessary in order to properly understand or apply the law. When judges or other decision makers misunderstand or misuse natural science, the laws' ability to achieve conservation goals may be hindered. Examples of situations in which decision makers got science wrong abound. E.g., an English court held that the Environment Secretary misunderstood the legal recognition of the scientific acceptability for species population fluctuations in order to justify a cull. Disagreement with scientists does not always mean that jurists are incorrect however. In other cases, decision makers must interpret terms that have different meanings in law and science, or must choose between differing scientific interpretations. This paper seeks to facilitate the improvement of environmental legal decision making by exploring methods for the interdisciplinary analysis of laws that contain science-inflected concepts.

Protection status and jurisdictional mismatches in the shadow of trophy hunting
Annecoos Wiersema, University of Denver, USA, Floor Fleurke, Tilburg University, Netherlands

This presentation will discuss the relationship between certain legal rules and decisions to use trophy hunting for conservation (without taking a position for or against trophy hunting). A decision to use trophy hunting as part of a conservation strategy often begins with a change to the protection status of a species that may

previously have been given the highest level of protection through a listing process. This in turn can create jurisdictional questions that arise from down- or de-listing a species. First, for example, there may be jurisdictional mismatches, where species are treated differently by different countries or in different regions within a country. Second, the question of who has jurisdictional authority can have an impact on the regulatory scheme in place for protection of the species, including the degree of protection for its habitat. Third, the question of form of law can also be connected to the jurisdictional level at which a species is governed. The presentation will draw on examples from international law (CITES, in particular), European Union law, and some domestic jurisdictions, including South Africa and the United States.

The US Endangered Species Act as a tool for de-facto sanctions

Catherine Semcer, Property and Environmental Research Centre, Bozeman, USA

The broad permitting powers granted to administering agencies by the US Endangered Species Act (ESA) creates an environment where arbitrary and politically motivated decision making is possible and opportunities exist for the law to be used by the US to impose de-facto sanctions. Such decision making risks undermining the intent of the Convention on International Trade in Endangered Species, the ESA itself and the conservation and development programs of emerging economies dependent on hunting revenue from the US trophy hunting market. The 2014, US moratorium on elephant trophy imports from Zimbabwe presents a case study in such ESA decision making and the impacts it can have on a nation's economic and political stability. I performed a qualitative analysis of the context of the US decision and its decision making process, combined with a quantitative and qualitative analysis of the impacts of the decision on rural livelihoods in Zimbabwe, regional security, conservation and development programs, and political stability. The case shows the power of the ESA to reach beyond traditional conservation and be a tool of geopolitical persuasion or coercion, and suggests the need for improvements to the law so that its intent as a conservation instrument under CITES is secured.

Leopards (*Panthera pardus*) and wildlife treaties – transboundary cooperation to improve the fate of the world's most international big cat

Arie Trouwborst, Tilburg Law School, University, Netherlands

There is a distinct but underexplored international dimension to leopard (*Panthera pardus*) conservation. Globally red-listed as 'vulnerable' as a species, the nine currently recognized leopard subspecies face widely varying predicaments. Leopards (probably) persist in 42 African and 29 Eurasian range states. At least 40 distinct leopard populations are transboundary. Furthermore, at least 11 biodiversity-related multilateral environmental agreements are of relevance to leopard conservation. Yet, leopards have hitherto received significantly less attention in the intergovernmental arena than other big cats like lions (*Panthera leo*), tigers (*Panthera tigris*) and snow leopards (*Panthera uncia*). This presentation explores the actual and potential relevance of global and regional conservation treaties for leopards. It is based on standard international law research methodology, informed by knowledge from other disciplines regarding leopards' threats and conservation needs. After presenting a bird's-eye view of relevant wildlife treaties – which include the Ramsar Wetlands Convention, the World Heritage Convention and the Convention on Migratory Species (CMS) – the presentation zooms in on the topical challenge of setting export quotas for hunting trophies under the Convention on International Trade in Endangered Species (CITES) in light of limited knowledge regarding leopard abundance and population trends in most range states.

Conservation Ethics 3
Session chair: Andrew Rowan, WellBeing International, USA

Conservation lessons from moments of 'moral panic': Marius, Cecil, Harambe, Tilikum, and Xanda
Mucha Mkono, University of Queensland, Australia

The last decade has witnessed a number of infamous killings of charismatic animals in captive and non-captive contexts. In the digital era where 'moral panics' are enacted on social media, these incidents have generated significant 'viral' geopolitical debates in relation to conservation and the treatment of animals. The paper views these incidents as teachable moments from which valuable lessons about conservation futures can be drawn. A number of questions are posed, including: What is fuelling these moral panics? What can we (academics, policy makers, practitioners) learn from them, as we strive for sustainable wildlife conservation outcomes? Examples from Africa and other contexts are presented.

Giving voice to humans and non-humans: inclusion and justice in use of natural resources
Phyllis Lee, University of Stirling, UK, and C. Hoffman, A. Schapper

Developing a sustainable, de-carbonised economy is a matter of institutional and policy complexity requiring re-thinking of conventional governance approaches. The transition process can generate and exacerbate multi-dimensional conflicts of interest between state and society, as well as between society and ecosystems. We argue that we need a better framework for a just transition process to sustainable, de-carbonised economies in a context of conflicting interests and severe climate change impacts. The transition process needs to be just and equitable in order to serve as an effective governance instrument for comprehensively reducing poverty and contributing to sustainable development. We argue that there is an urgent need to give voice to all actors within an ecosystem, including the nonhuman world. Our novel suggestion is to move biodiversity from its role as a subject whose life processes are managed (by conservation bodies, international treaties or states) to a political actor in its own right. A more familiar understanding consists of (a) protection of the environment, (b) economic, and (c) social development as the three basic pillars to achieving sustainability. We suggest that true sustainability requires that both humans and non-humans have access to sufficient resources for their needs; the existing separation between humans and their surrounding biospheres leads to a solely anthropocentric construction of development. The economic dimension is often put at the forefront in sustainable development practice, including approaches that focus on payments for ecosystem services. We need a rebalancing of the three pillars based on the recognition that economic policies cannot be sustainable in the absence of participation from actors of the nonhuman world. Enabling the non-human voice as an equal stakeholder through representatives in discourse on risk and revenue sharing suggests a way forward that is embedded in constructs of change and justice. Procedural justice mechanisms, including the right to information, the right to participation and the right to compensation, need to be observed for stakeholders from both the human and nonhuman worlds.

Did we ask wolves whether they consent to be managed?
Guillaume Chapron, Swedish University of Agricultural Sciences, Sweden and Yaffa Epstein, Uppsala University, Sweden

There is an increasing focus on collaborative governance to enact wildlife conservation policies, where non-state stakeholders engage in collective, consensus oriented and deliberative decision-making processes. This form of governance, it is argued, will increase the legitimacy of conservation policies. However, while this governance is presented as being truly democratic, inclusive and participatory, it is systematically grounded on the exclusion of one party: wildlife itself. Because of this deliberate omission, policies built on successions of compromises will never establish lasting safeguards that can protect nature under a growing human population and economy. The crux of the problem lies in the fact that nature does not have rights on its own. Having rights carries profound governance implications for the importance given to a party's recognition,

procedural access, and distribution of benefits and costs. The party's own interests need to be explicitly taken into account and are no longer what other parties exclusively and arbitrarily decide they can afford. Legal personhood further implies that the party can initiate legal actions on its own, that the court must consider the injury suffered by that party and that relief must run to the benefit of the party. Human societies have for centuries extended the scope of legal personhood to include more human beings or inanimate agents. Conferring rights to some new entity – such as trees and forests – are often met with laughter or fear, because until the rightless thing receives its rights, it is only a thing for the use of the right holders at the time. Resistance to giving the thing rights is expected until it can be valued for itself; however valuing it for itself is hard until the right holders give it rights.

The Anthropocene: Geopolitical challenges and opportunities for conservation ethics

Bernhard Malkmus, Newcastle University, UK

The Anthropocene debate has changed important parameters of how humans reflect on themselves: (1) as a major geological agent with a significant impact on the biosphere (Waters et al. 2016); (2) as a creature increasingly shaped cognitively and psychologically by the "technosphere" rather than the biosphere (Haff 2014); (3) as agents incapable of fully controlling the "technosphere" and therefore, paradoxically, having to confront being a biological species (Chakrabarty 2010). The Anthropocene concept challenges certain historical justifications of protected areas, namely the epistemological separation between natural and cultural histories; the division of labor between environmentalism and conservation; the psychology of spectacle tourism. It therefore also offers valuable opportunities for reframing the ethical foundation of protected areas, e.g. (1) rethinking ecological connectivity within a Earth systems approach; (2) rethinking the importance of preserving ecological processes within the context of macro-ecological resilience; (3) acknowledging the rapid changes in attitude towards nature among visitors and rethinking the role of re-wilding as a broader cultural task. By engaging with the transboundary National Parks Bavarian Forest (Germany) and Šumava (Czech Republic) and their geopolitical partners, this paper will argue for the value of showcasing rather than hiding Anthropocene-related problems in protected areas; for reframing the wilderness debate as a socio-cultural challenge for consumerist societies; for forging strategic geopolitical alliances between protected areas that make the Anthropocene debate an integral part of their public mission. (Dupke/Dormann/Heurich 2018).

Conservation Ethics 2

Session chair: Paul Johnson, WildCRU, Zoology, University of Oxford, UK

Bosses, baddies, and "baby-huggers": the ethics of fundraising in orangutan rehabilitation

Ally Palmer, University of Oxford, UK

In the global South, conservation funding generally travels from the North, via states, charitable foundations, individual donors, and companies (including those involved in environmentally destructive activities). For conservation NGOs, accepting funds from any one of these sources comes with certain strings attached, potentially creating an ethical dilemma for the NGO if they have limited funding options. This paper is concerned with exploring, primarily from the NGO perspective, what those ethical trade-offs involve, and how NGOs and donors seek to manage their relationships with one another. In particular, I focus on funding for orangutan (*Pongo spp.*) conservation, especially rehabilitation and reintroduction (R&R): the process of helping orphaned infants recover and gain survival skills before release into the forest. Although orangutan R&R appears more popular than many conservation causes, R&R projects struggle to secure sufficient funding for this highly expensive activity. They may therefore feel compelled to accept donors' requests, which can include oversight and ownership in the case of foundations, permission to use NGOs for "greenwashing" in the case of companies, and requests to inappropriately cuddle with "cute" orphans in the case of individual donors.

Mosquitoes' struggle: notes about ecology and co-inhabiting in a conservation unity in Brazilian backwoods

Túllio Maia, Universidade Federal de São Carlos, São Paulo, Brazil

The Brazilian semiarid backwoods, with its exclusive biome Caatinga, is peculiarly warm and dry. Historically it bases revealing narratives about the strength of sertanejos – those people who live in the backwoods. The austerity policies practiced there reinforce the poverty of the people living their "sore lives". There are also mosquitoes co-inhabiting with sertanejos. These insects' biodiversity has been an institutional concern since Brazilian Vector Diseases have turned into a "global alarm". In the surroundings of a Conservation Unity, I hear from some sertanejos that in Caatinga, each one has his/her/its own struggle. People, animals, plants, even stones develop different struggles for living or staying well in an entangled environment. In addition to fight for a living, by biting people and animals, mosquitoes struggle against public policies standing for vanishing their population at the minimum signal of threat. I propose, then, through an oral presentation, to bring notes about people and mosquitoes, their correlated ecologies, co-inhabitations, and their specific struggle for living well in a warm and dry environment. It is my intention to request the available bursary, due to Brazilian economic and political crisis.

Biology, radical conservatism and the origins of geopolitics

Ian Klinke, University of Oxford, UK

Biology, radical conservatism and the origins of geopolitics. In reflecting on the theme of this conference, this paper explores the intellectual and political milieu in which 'geopolitics' emerged in the late 19th century both as a worldview and a guide to statecraft. Through an examination of the work of the controversial German zoologist turned political geographer Friedrich Ratzel (1844-1904), it reveals the biological origins of modern understandings of the political struggle for territory and space. The paper traces Ratzel's impact on a subsequent generation of thinkers who would shape the 20th century both intellectually and politically. It concludes that whilst Ratzel was certainly no conservationist, for he believed in the need for the weak to make room for the strong, his radical conservatism raises crucial questions about the continued popularity of geopolitics amongst a wide array of 21st century socio-political movements, including conservationism.

The congealing nature of world heritage: emergent properties of 'kinservation'

Daisy Sutcliffe, University of Glasgow, UK

Rooted in what Bonta and Protevi (2004) call Deleuze and Guattari's 'geophilosophy,' Bennett's (2010) vibrant materialism and Dixon's (2015) feminist material geopolitics, I use my PhD fieldwork in the Galapagos archipelago to reveal the multiple ways in which UNESCO's World Heritage Programme congeals the wildlife it sets out to conserve, and also human interactions with it. Claimed to be one of UNESCO's most successful programmes, the World Heritage programme has now been running for forty-six years, and its development goes back much further. It has shaped conservation practice and policy globally during this time, but was conceived primarily by the victors of World War Two as they set up structures for international diplomacy. Acknowledging the debates and opportunities for exchange of practice that the World Heritage Programme has facilitated, I argue that other ways of interacting with the world, such as Australian aboriginal (Rose 2003) or Andean Quechua, might enable a less congealing conservation practice. Due to the conception of wildlife as kin, and Haraway's call to 'make kin' with wildlife in 'the chthulucene' (2015) I call this 'kinservation'.

Human-Wildlife Coexistence
Session chair: Craig Packer, University of Minnesota, USA

The impact of climate change on community-based wildlife management: a case study from northwest Namibia
Stefan Carpenter, Indiana University, USA

A significant body of literature addresses the deleterious impact of climate change on biodiversity and species extinction. Most research examines the threat to wildlife from changes to natural systems, such as alterations in habitat or food availability. However, climate change is also likely to increase the frequency of human-wildlife conflict (HWC) as people and wildlife in rural areas contend with progressively scarcer natural resources. Long-term increases in HWC could undermine the durability of community-based wildlife management (CWM), which relies on participants perceiving that the benefits associated with wildlife outweigh the costs. This paper explores the impact of climate change on HWC in Namibia's Kunene region. Relying on semi-structured interviews and household-level surveys conducted within four adjacent conservancies, it finds that an extended drought has likely caused a significant increase in the frequency of HWC. Increases in conflict intensify the need for conservancies to provide emergency social services and may exacerbate existing intra-community tensions over the distribution of conservancy benefits and employment. These findings highlight the need for international planning and funding focused on increasing the resiliency of community-based approaches to biodiversity conservation.

Using cross-country comparisons to explore patterns in livestock management and reduce human-carnivore conflict
Laura Perry, University of Oxford, UK

Conflict between people and carnivores is a major threat to predator populations, particularly where livestock predation is common. Despite interest in this issue across sub-Saharan Africa, there has been little work exploring patterns in conflict across the continent, and conflict-reduction is often approached on a case-by-case basis. My work focuses on broad comparisons between sites, countries, and regions, to explore geographical and social variation in livestock management practices, and the occurrence of human-predator conflict. This work integrates a range of sites across a large geographical area, and a range of disciplines, including conservation, psychology, and sociology. In this paper, I will present my methods for exploring the social and psychological context that informs livestock management practices, particularly focusing on cross-site comparison. I will discuss results pertaining to livestock management across Kenya, Botswana and Zimbabwe, and explore the implications of local and national differences for predator conservation. Preliminary data shows that location is a significant factor in explaining variation in livestock management approaches, demonstrating that a one-size-fits-all approach to improving management and reducing human-predator conflict is not suitable.

Human – leopard conflict and conservation measure in Himalayan region of Pakistan
Asma Jabeen and Arooj Fatima, Fatima Jinnah Womens University, Pakistan

Conservation policies are developed at National and International levels to protect endangered species but continental-scale strategies are challenging geopolitical dilemmas. Common leopard (*Panthera pardus*) is listed as vulnerable according to IUCN. In Pakistan, common leopard is concentrated in the Moist Temperate forest, Margalla Hills National Park, Murree Reserve Forest, Ayubia National Park and adjoining forest of Khyber-Paktunkhwa, Azad Jammu and Kashmir. The main threats are hunting, illegal killing and human-leopard conflict. This research attempts to quantify the loss caused to communities by common leopard attacks and common leopard killing by communities. We use official records from the wildlife department and interviews with the community people affected in areas where these incidences take place. We aim to change

community attitudes and behaviour through education and training which will help to reduce human leopard conflict and promote the conservation of the species.

Mitigating human-wildlife conflict using the Thomas Kilmann instrument: a case study of Bandipur Tiger Reserve

B.M. Mandara, Christ University, Bengaluru, India

Human-wildlife conflicts have risen with the increasing pace of industrialization and the growing developmental projects which pose grave threat to wildlife. Conflict resolution is crucial for the success of conservation development plans which require people and wildlife coexisting. There is always a significant level of conflict that often remains even after damage has reduced, indicating conflicts require approaches that could resolve the issue on a long-term basis. This paper seeks to determine the effectiveness of policy measures implemented by the stakeholders to help resolve the conflict. Any amount of dedicated hardwork and effort does not always result in success in conservation. Negotiation, mediation, arbitration, post-conflict peace building are the few aspects that form an essential part of mitigating a conflict. To quote Eric Dinerstein, conservation is 10 percent science and 90 percent negotiation. Hence, this paper highlights the need for integrating within itself various dispute resolution mechanisms in order to reach solutions. Conservation models tend to be very dynamic in different settings. There is a moral responsibility to help species endure, not just describe their life. The paper shall focus on using the Thomas Kilmann Conflict Mode Instrument (TKI) which looks into the prospective approaches to dealing with human-wildlife conflicts.

Human-wildlife coexistence: a utopia?

Aenne Post, Kisumu, Kenya

Conflicts between people and wildlife are a major threat to animal conservation in Africa. People's perceptions, values and attitudes play a crucial role as these determine how humans perceive the level of conflict, their response to it and the implications for conservation outcomes. Hence, the roles of actors in wildlife governance influence how human-wildlife conflicts are dealt with. One of the key challenges is how to generate coexistence between people and wildlife, especially in non-protected areas. This paper focuses on ways to mitigate human-hippo conflicts in Lake Victoria, Kenya, where human lives and livelihoods are being affected by the havoc creating gregarious hippos, while the hippo population is under threat due to increased human activities and climate change. There is a thin line between the survival of humans and the extinction of hippos. Where do we draw this line? What are the solutions to overcome this unsustainable situation? Can we create wildlife policies that enable coexistence with hippos and if so, are we inclined to implement such policies?

FRIDAY 22nd MARCH

Illegal Wildlife Trade

Session chair: EJ Milner-Gulland, ICCS, Zoology, University of Oxford, UK

Monitoring of illegal ivory trade in Kenya: the analysis controversy and geopolitics

Shadrack Ngene, Kenya Wildlife Service, Kenya

Monitoring illegal trade in elephant products and illegal killing of elephants was first mandated at the 10th meeting of the Conference of the Parties (CoP10, 1997, Harare) when the Conference of the Parties adopted Resolution Conf. 10.10 on Trade in elephant specimens. The resolution called for the establishment of a comprehensive international system to monitor the illegal trade in elephant specimens. This resulted to establishment of Elephant Trade Information System (ETIS). Data to ETIS is provided by range states arrests of transit ivory, media reports, and ivory seizers at ports of entry or exits. Analysis of data is done by the ETIS team with minimal input from countries providing the data. The current report is for the period 2008-2017.

Cluster analysis is used to group countries with serious issues of consignments of ivory being seized at their port of exists or being the source of consignments seized at other ports. The information is used to group countries that require development and implementation National Ivory Action Plans. But, are there geopolitics in data analysis?

Targeting wildlife crime interventions

Stephanie Romañach, U.S. Geological Survey, USA, and *Peter Lindsey, Wildlife Conservation Network, Sally Faulkner, Michael Stevens and Steven Le Comber, Queen Mary University of London*

Using a case study from the Savé Valley Conservancy (3,450 km^2) in Zimbabwe, we present a novel method for investigating wildlife crime. We used several years of poaching location data to show how geographic profiling, a mathematical technique developed in criminology, can be adapted to wildlife crime. This Conservancy is a wildlife area held in ownership by private, government, and community entities, and primarily used for safari hunting and photographic tourism. The Conservancy was partially occupied by subsistence farmers in 2000 following land reform in Zimbabwe. Perimeter game fencing was removed by settlers – enough to make 400,000 wire snares. The wildlife poaching that resulted led to financial losses of over $1 million (USD). We used a subset of poaching data collected in the Conservancy (where poacher identities were known) from August 2005 to July 2009. We applied geographic profiling to over 10,000 poaching incidents of 6,454 poached animals. Locations of connected poaching crimes were used to calculate the probability of offender residence. Our results show that geographic profiling can successfully identify areas where poachers may live based only on the spatial locations of poaching incidents. This has important implications for targeting antipoaching interventions, development of management strategies, and targeting areas for community-based initiatives.

Social media as an influencer: insights from pangolins and otters

Lauren Harrington, WildCRU, Zoology, University of Oxford, UK

On a global scale, use, influence and global reach of social media continues to spread: worldwide there are one million new users every day. Social media is relevant to wildlife traders, consumers, researchers and law enforcers, as a platform for sales, an influencer (positive and negative), and a data source. Here we explore two case studies illustrating, respectively, the positive influence of social media in raising awareness (of illegal trade in pangolins) and the negative influence of social media in driving demand (for otters as pets). Attention focused on pangolins and the threats posed to their survival by international trade has skyrocketed across all digital information platforms over the last decade. To identify particular events (or types of events) that may have been particularly influential in raising awareness we explored temporal co-occurrence between events and peaks in media activity and public interest. We highlight in particular the apparent importance of media coverage of 'shocking' events in attracting public interest. A number of recent reports have highlighted an apparently new trend in keeping otters as pets, particularly in SE Asia. To assess whether social media might be driving demand, we explored recent trends in the numbers, views, popularity of, and engagement with, YouTube videos of pet otters. Analysis of social media data can provide insights into peoples' interests and potential fashion 'fads' and we suggest that it may offer a useful tool for the detection of evolving and emerging markets in wildlife trade. The (negative) influence of social media in driving demand is often alluded to but has received little research to date; the (positive) influence of social media in raising awareness is widely used but its effectiveness is difficult to predict. Both warrant further attention.

Monitoring illegal trade in snow leopards: 2003 to 2014: addressing geopolitical constraints

Aishwarya Maheshwari, Banda University of Agriculture and Technology, India

Illegal trade in snow leopards (Panthera uncia) has been identified as one of the major threats to long-term survival of the species in the wild. To quantify severity of the threats to dwindling snow leopard population,

we examined market and questionnaire surveys, and information from the published and unpublished literature on illegal trade and poaching of snow leopards. We collected information from 11 of the 12 snow leopard range counties in central and southern Asia, barring Kazakhstan, and reported 439 snow leopards (88 records) in illegal trade during 2003e2014, which represents a loss of approximately 8.4%e10.9% snow leopard population (assuming mid-point population of 5240 to minimum population of 4000 individuals) in a period of 12 years. Our data suggested a 61% decadal increase in snow leopard trade during 2003e2012 compared with 1993e2002, while taking the note of significant strengthening of wildlife enforcement and crime control network in the decades of 2000s and 2010s. We found 50% prosecution rate of snow leopard crimes resulting in only 20% conviction rate globally. Many limitations e.g., secretive nature of illegal trade, ill developed enforcement mechanism, poor and passive documentation of snow leopards' seizures, restricted us to reflect actual trend of snow leopards' illegal trade. Even on a conservative scale the present situation is alarming and may detrimental to snow leopard conservation. We propose an effective networking of enforcement efforts and coordination among the law enforcement agencies, efficient collection of data and data management, and sharing of intelligence in snow leopard range countries, could be useful in curbing illegal trade in snow leopards in central and southern Asia. 2010s. We found 50% prosecution rate of snow leopard crimes resulting in only 20% conviction rate globally. Many limitations e.g., secretive nature of illegal trade, ill developed enforcement mechanism, poor and passive documentation of snow leopards' seizures, restricted us to reflect actual trend of snow leopards' illegal trade. Even on a conservative scale the present situation is alarming and may detrimental to snow leopard conservation. We propose an effective networking of enforcement efforts and coordination among the law enforcement agencies, efficient collection of data and data management, and sharing of intelligence in snow leopard range countries, could be useful in curbing illegal trade in snow leopards in central and southern Asia.

Conservation in the Age of Geopolitics
Session chair: David Macdonald

Academia, international wildlife trade, and effective conservation: is there really common ground?
Rodrigo Medellin, Universidad Nacional Autónoma de México

Multilateral environmental agreements are often met with the proverbial fear of the unknown. Over the more than 40 years of history, CITES has been dismissed, underplayed, or ignored altogether by many academics and conservation professionals. The truth is that CITES is one of the most effective tools we have to secure true sustainable use and conservation. From its inception as a binding agreement, to its constant evolution incorporating and refining such effective conservation tools as significant trade, non-detriment findings, and periodic review of the appendices, CITES integrates the most robust available science and requires much more participation by scientists with knowledge about particular species or specific processes. Examples abound of how CITES truly works for conservation. Vicuñas in South America, crocodiles in Mexico, saker falcon in central Asia, sharks throughout the world, conservation is moving forward but needs the help of many more scientists to improve its processes and tools. Time to engage.

Who cares pays; or do they?
Craig Packer, University of Minnesota, USA

Conservation of large dangerous animals such as elephants and African lions requires extraordinary effort. Since independence in the 1960s African governments have operated their wildlife reserves on the assumption that user fees (entrance fees or hunting permits) would cover the necessary management costs. However, recent analyses suggest that Africa's protected areas face an annual funding shortfall of $1-2 billion, and the problem will worsen in the face of a rapidly growing human population. Given the challenges of pervasive poverty and high-level corruption, any supplemental funding from donor nations will require careful allocation of scarce conservation funding. In my presentation, I will show how eco-philanthropists and conservancy managers are tackling these problems and bringing new hope to wildlife conservation in Africa.

POSTER SESSION

Transboundary criteria to set conservation priorities for carnivorans from the northern Pampas
Diego Queirolo, Universidad de la República, Uruguay, Tirelli, F.P., Pereira, J. and Eizirk, E.

There are 16 carnivoran species in the northern Pampas, a temperate region spanning northeastern Argentina, southernmost Brazil and Uruguay. Nine of these species have the southern limit of their distribution in the region, while two others have their northern limit in it. The former indicates a large presence of species of tropical origin, which together with those from the south (southern Pampas) and the west (Chaco) leads the region to harbour great diversity of this group. From a phylogeographic point of view, *Leopardus colocola* and *Conepatus chinga* present a distinct population unit in this region, with some evidence suggesting they may represent endemic species. This distinctiveness highlights the need for designing specific conservation strategies targeting these regional populations. At the same time, the transformation in the use of land by agricultural and livestock practices has led to the inclusion of the majority of the region's carnivorans (9) in threatened categories. Evidence of endemism and phylogeographic differentiation, as well as a high degree of threat, make this group a priority for more in-depth studies and conservation actions. To set conservation priorities, it is crucial to deepen the scientific cooperation existing today and advance a step more including the regional governments.

Human dimensions of dog-wildlife conflict in Nepal, Himalaya
Debby Ng, National Geographic Early Career Explorer and University of Tasmania, Australia

Domestic dogs have strong associations with human populations. Human cultural practices and attitudes can shape dog fitness and behaviour with ramifications for disease transmission to wildlife. An example is canine distemper virus (CDV) which can occur at high prevalence in dog populations and have potential to cause mass mortalities in wildlife. The prevalence of CDV and the relationship between Himalayan communities and their dogs has not been previously investigated. This study described the cultural attitudes and husbandry practices surrounding Himalayan communities and their dogs and examined CDV exposure of dogs living in a protected area in Nepal. Seventy-one dogs from 10 villages in Annapurna Conservation Area were sampled. High levels of exposure to CDV were found and models that examined the relationship between household factors and dog demography provide evidence that the location and the age of dogs could determine CDV exposure. This study also described wild carnivores commonly observed within village boundaries. Contact between dogs and these carnivores could represent an important risk for spillover. Future directions include evaluating the prevalence of CDV in wild carnivores living alongside village dogs, and to develop trails for dog management to test how the risks of disease transmission might be reduced.

Ranger perceptions of cooperation in transfrontier conservation areas
Joshua Powell, National Geographic Young Explorer and Peter Coals, WildCRU, Zoology, University of Oxford, UK

Transfrontier conservation areas (TFCAs) represent important areas in conservation management. Ecosystems and priority species regularly cross international political borders, making their effective management and conservation dependent on cooperation between neighbouring states, which may represent a significant geopolitical challenge at both governance and operational levels. Recognition of the importance of effective TFCAs is growing, with increasing numbers being established globally. Scholarship to-date has tended to focus on the governance of TFCAs and landscape scale effects on species and communities, with little work to examine the place of field rangers in transfrontier conservation. Rangers represent a vital aspect of the practical management of conservation areas, but one which is poorly researched, particularly outside of the tropics. In northern Kyrgyzstan we surveyed field rangers' perceptions of cooperation with rangers of other protected areas and across international borders, examining where cooperation occurred, how rangers

viewed cooperation and what skills and training capacity building could be shared across international borders.

Decline in the population trends of Asian houbara (*Chlamydotis macqueenii*) in the Cholistan desert, Pakistan

Manahal Fatima and Asma Jabeen, Fatima Jinnah Womens University, Pakistan

The Asian Houbara bustard is a migratory species, ranging from North Africa to Asia. The population of Houbara bustard is declining worldwide. According to IUCN, falconry and illegal hunting have contributed to the decline of its population by 50%. This research was conducted in Cholistan desert, Pakistan to understand the decline of population. Personal interviews with relevant authorities, questionnaire surveys and field surveys were done. Data were collected from 50 respondents including landowners, shepherds, wildlife officials and conservationists. The major hunters were foreigners, illegal hunters and local community. Methods of hunting are falcons, gun shoots but mostly falcons are used. The main driver of hunting by local community is for income. The money from selling Asian Houbara range from 7US Dollar to 752 US Dollar. Challah by wildlife department also done including fine and jail. Major reason for decline is falconry, hunting, predation and habitat destruction. There is a need for strict rules and regulation. Community awareness and education play an important role in conservation of bird.

Horizon scanning for significant global emerging issues in illegal wildlife trade

Nafeesa Esmail, ICCS, Zoology, University of Oxford, UK

Illegal wildlife trade is gaining prominence as a global threat to biodiversity, but remains inadequately researched and poorly understood. As the magnitude and complexity increases and to help inform appropriate future policy responses in the face of uncertainty and act proactively, we conducted a horizon scan for significant emerging global issues. We built upon existing iterative horizon scanning methods, using an open and global participatory approach to evaluate issues from a diverse range of sources. Key issues that emerged related to developments in biological, information and financial technologies; changing trends in consumer demand for wildlife products, and global demographic and political shifts (particularly between and within East Asia, Africa and Latin America). The top three ranked issues related to China, illustrating its vital role in tackling emerging threats. This analysis can support national governments, international bodies and others as they develop strategies for addressing the illegal wildlife trade and researchers as they examine issues of potential future importance. Gaining a better understanding of what is to come will help reduce the unpredictability of impacts, allow time and resources for technological progress, and affect policy change and on-the-ground action, whilst solutions are achievable.

Wild animal species being traded as pets in Rawalpindi and Islamabad, Pakistan and assessment of their conservation status

Komal Dua and Asma Jabeen, Fatima Jinnah Womens University, Pakistan

Animal used for pets are growing with focus on wild caught species. Pets are traded and the trend is increasing. Pet markets buy pets from dealers, poachers and pet owners. Pet trade effect on functioning of ecosystem. Pet shops were visited to investigate wild pet species, 44 pet shops were surveyed. More than 50 percent of species traded are listed in the IUCN red list. Among these ten are listed in CITES. Wild pets and their trade emerging as pet industry. There is a chain of individuals who helps in the transfer of animals from wild to pet shops. Pets are traded from Malaysia, Thailand, Indonesia, Central Africa, Australia, Nigeria, Argentina and Brazil. Mostly people demands the wild captured animal which forces the pet shops owners and poachers to source the species from wild. There is a need to create awareness to not used wild animals as pets and enjoy animals in their own habitat.

The Cecil Moment: celebrity environmentalism, Nature 2.0 and the cultural politics of lion trophy hunting

Sandra McCubbin, Queen's University, Canada

Celebrities are increasingly prominent in conservation campaigns. By wielding funding and/or influence they shape public understandings and responses to conservation challenges. Simultaneously, publics are increasingly engaged in conservation issues via Web 2.0 platforms like Twitter and Facebook. Both celebrity and Nature 2.0 environmentalisms often work transnationally, expressing and evoking care for distant conservation concerns. This paper explores the Cecil Moment as a case study of the cultural politics of the environment, asking how do celebrity and Nature 2.0 environmentalisms work and to what conservation politics do they lead? Drawing on political ecology, I develop an analytical framework for examining the Cecil Moment that considers its network of actors, narratives foregrounded and backgrounded, and outcomes. Empirical insights are drawn from document and media review and key informant interviews. I argue the Cecil Moment operated through a more-than-human network and mutable narratives that turned attention away from the anti-trophy hunting politics which sparked it, and toward lion conservation in general. Findings suggest scholars and activists should be cautious about the progressive potential of celebrity and Nature 2.0 environmentalisms. The poster ends with discussion of how a politics of visibility might be employed for a more progressive, sustainable engagement with celebrity and Nature 2.0.

Investing in change that matters

Nqobizitha Ndlovu, African Leadership University

I describe a theory of change for development for an inclusive rural economy in Africa. Examples include climate innovation projects for rural energy efficient stoves, drip irrigation for small holders, and inclusive supply and value chains for small holders. All of these projects in the biodiversity economy require a journey which creates thriving enterprise with accountable leadership and community engagement, in each case innovating and accelerating with the people for the people.