

Plenaries

All plenaries will take place in the: AMPHITHEATRE SINE SALOUM

Impacts, processes and consequences of urbanisation for birds and conservation

Dr Karl Evans, Sheffield University

Monday 17th October 2016: 10:00

Urban ecology has emerged as an important and rapidly growing research field. Two of the world's ten largest megacities occur in Africa, and urbanisation will increase tremendously on the African continent, with some of the highest urban growth rates occurring in biodiversity hotspots. Given this context far too little urban ecology research is conducted in Africa. I draw upon a wide range of studies to assess how unique urban selection pressures structure bird assemblages in towns and cities, and drive ecological, behavioural and genetic divergence between urban and rural conspecific populations. I then explore the relevance of these findings for conservation, and discuss strategies for minimising adverse impacts of urban growth on avian biodiversity.

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Lessons from the Asian vulture crisis – Identifying the causes of vulture declines and then coordinating a regional response including the creation of a consortium 'SAVE'

Dr Chris Bowden, IUCN Vulture Specialist Group & Royal Society for the Protection of Birds

Tuesday 18th October 2016: 09:00

There have been very few more dramatic, fast and wide scale species declines than those of South Asian vulture populations since the 1990s. The formerly most abundant of these across the region, the white-rumped vulture *Gyps bengalensis*, declined by 99.9% over less than 20 years. The main cause was shown to have been the veterinary drug diclofenac which was being widely used to treat cattle, and which proved to be lethal to vultures feeding on cattle carcasses that had been treated shortly before death. Three priority actions were identified as urgently required in order to prevent the total extinction of at least three endemic species: Removal (through effective banning) of the veterinary drug, the identification of safe alternatives, and the establishment of captive populations for later reintroduction back to the wild. But several challenges meant that instigating a sufficiently quick and coordinated approach was not something that would happen automatically.

The fact that detecting the drug in dead vultures requires very sophisticated and sensitive testing, the vultures live long enough after ingestion, that they die well dispersed away from the toxic carcass – all of which means that only through rigorous scientific analysis could the correct conclusions regarding the main cause be made. International boundaries and restrictions regarding the transport and export of samples further added to the challenge. Speedy rigorous scientific publication in peer-reviewed journals was a key step, and the engagement of in-country scientists and institutions was essential. Ongoing rigorous scientific inputs was also important, and then the communications of these (including collection and analysis and writing up of monitoring work both for vultures and the drugs concerned) led to Government attention and key legislative changes (ie bans of veterinary diclofenac). Having some demonstration focus to the work has been helpful (in terms of holding captive stock), but even with all these aspects covered, there was still a need to develop a recognised consortium of partners that deliver consistent messages and maintain credibility for these messages to be taken seriously by respective governments. In February 2011, seven years after the diagnosis of the main diclofenac problem (although other veterinary drugs had meanwhile emerged as also being problematic), a consortium of 14 partners from across the region signed up to work together under the banner ‘Saving Asia’s’ Vultures from Extinction’ ([SAVE](#)), and these meet and report annually. This has certainly helped, and the mechanisms of setting this up are presented. Partners are mainly NGOS but also include key government institutions. A multi-lateral governmental committee was created soon after the formation of SAVE and provides a further forum for agreed priority actions to be taken up at higher levels. The combined effect is a significant degree of coordination regarding the key steps required (an annually updated list, as well as a Blueprint Regional Vulture Recovery Plan to 2025), but a number of challenges remain, and the release of birds back to the wild offers a high profile opportunity to engage and attract support more widely, and to publically test the safety of the environment for releases and the potential recovery of the species in the wild.

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Conservation of Afro Palearctic migrant birds: An unsolvable problem?

Dr Juliet Vickery, RSPB Centre for Conservation Science, Royal Society for Protection of Birds

Thursday 20th October 2016: 09:00

The declines of Afro-Palaearctic migrants birds, throughout Europe, are an issue of growing conservation concern with European breeding populations of some widespread species having more than halved over thirty years. Migrant birds are likely to be highly susceptible to environmental change as their complex annual cycle, long migration routes and dependence on different sites at different times places them in ‘multiple jeopardy’. This complexity also makes identifying the underlying drivers of declines a challenging scientific problem. In this talk I focus on some recent advances in four key areas: detailed field studies of migrant birds in sub Saharan Africa and at staging sites to understand wintering ecology and resource requirements; use of remote sensing earth observation data to improve our understanding of how and where land cover is changing; use of survey and demographic data from the European breeding grounds to explore spatial and temporal patterns of demographic parameters, and use of new and emerging

tracking technologies technologies to identify migratory pathways and strategies and connectivity. I then suggest a few key areas where better collaboration between countries, scientific disciplines and international and national organisations, will be required to stem, and ultimately reverse, the population declines in these species.

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Recent Progress of the Phylogeny of Birds: Putting Birds on the Great Tree of Life

Prof Richard O. Prum, Peabody Museum, Yale.

Thursday 20th October 2016: 13:30

Although reconstruction of the phylogeny of living birds has progressed tremendously in the last decade, the evolutionary history of Neoaves— a clade that encompasses nearly all living birds— has remained the greatest unresolved challenge in avian systematics. The problem has been that most Neoavian lineages diverged rapidly, resulting in very short branches that are difficult to resolve. New data sets from next-generation sequencing methods have finally produced high quantities of high quality DNA sequence data, that have now allowed us to make great progress on resolving Neoavian phylogeny. Recently, we investigated avian phylogeny with an unprecedented scale of data: >390k bases of genomic sequence data from each of 198 species of living birds, representing all major avian lineages, and two crocodilian outgroups. Sequence data were collected using an Anchored Hybrid Enrichment technique, yielding 259 nuclear loci with an average length of 1523 bases. Bayesian and maximum likelihood analyses yielded highly supported and nearly identical phylogenetic trees for all major avian lineages. Five major clades form successive sister groups to the rest of Neoaves: (1) a clade including nightjars, other caprimulgiforms, swifts, and hummingbirds, (2) a clade uniting cuckoos, bustards, and turacos, with pigeons, mesites, and sandgrouse, (3) cranes and their relatives, (4) a comprehensive waterbird clade, including all diving, wading, and shorebirds, and (5) a comprehensive landbird clade with the enigmatic Hoatzin (*Opisthocomus hoazin*) as the sister group to the rest. The results of our divergence time analyses are congruent with the palaeontological record, supporting a major radiation of crown birds in the wake of the K-Pg mass extinction.

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Impacts of Development on birds and IBAs

Ademola Ajagbe, BirdLife International

Friday 21st October 2016: 09:00

Fast paced development characterises the present day scenario of majority of Africa's landscapes. It comes as no surprise to see three Africa nations ranked high among the world fastest growing economies in the International Monetary Fund's World Economic Outlook publication of April 2016. While developments, in a sense, promises a better future, it often impacts negatively on the

Continent's fragile biodiversity. BirdLife International has identified, mapped and documented over 1,200 Important Bird and Biodiversity Areas (IBAs) in Africa, using a set of standardized, globally applicable categories and criteria. Recent studies show a growing trend in the numbers of IBAs affected by vast and varied developments in Africa, posing grave threats to a wide range of bird species and other biodiversity. This presentation will highlight some of the challenges of development in Africa and approaches to reform development trajectories to deliver benefits for nature and people.

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The ABC Lecture:

Every little helps: How small projects contribute to African bird conservation

Richard Charles, Chairman, and Chris Magin, Conservation Officer, African Bird Club

Friday 21st October 2016: 15:15

The African Bird Club (ABC) promotes the study and conservation of birds in continental Africa and associated island groups such as Madagascar, the Seychelles, Azores and Canaries. The ABC was founded in 1994 and is a registered, membership-based charity managed on a voluntary basis by a Council of trustees. We are a relatively small organisation with around 1,000 members and a network of representatives across Africa and the world. The club aims include: to provide a worldwide focus for African ornithology; to raise money to support conservation projects in the region through the Conservation Fund; and to publish a twice-yearly colour Bulletin. Richard Charles will introduce and promote recent and imminent developments at ABC, notably the intention to offer free membership to Africans linked to the eBulletin. The ABC's Conservation Fund awards small grants providing opportunities for students, researchers and local communities to increase our knowledge and enhance the conservation of the region's 2,400 or so bird species (around 257 of which are globally threatened) and 1,247 Important Bird Areas. Chris Magin will highlight some of the 224 diverse projects that the Conservation Fund has supported since its inception. To date awards have totalled more than £275,000. We hope this presentation will encourage PAOC participants to make future applications to ABC's Conservation Fund to support their research and conservation projects.

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Oral Presentations

Monday 17th October 2016: 11:30-13:00

AMPHITHEATRE SINE SALOUM: African Raptor Conservation and Ecology

11:30 Raptor Keynote: Arjun Amar, Andre Botha, Munir Virani

Raptor conservation in Africa: an overview

Human population are growing faster in Africa than in other parts of the world and these increases have also been coupled with increases in development and land use change. These changes are likely to have profound effects on biodiversity and indicator species may play an important role in alerting the conservation community to problems of environmental quality. Raptors species have a global history as important indicator species, and may serve a useful function in the near future within an African context. How raptors cope with these changes is an important conservation challenge.

This review focuses on the conservation status and ecological knowledge of diurnal raptors across Africa. We firstly update an earlier review examining this issue that was undertaken 20 years ago. We will then explore what we know about how raptor populations have changed over recent years, drawing on the limited number of studies that have explore population changes in raptors abundance through repeat surveys. We will then describe the key threats facing populations and some of the studies that have identified these threats.

Lastly, we I will talk about some key current research that are currently on-going and where future research might be usefully directed.

12.00 Raptor 2: Shane McPherson, Ben H Hoffman, Bruce D L Padbury, Colleen T Downs
Hazards in the Urban Jungle: Crowned Eagles and wildlife conflict mitigation in Durban, South Africa.

Wildlife management is primarily a human response to reduce or eliminate causes of economic or social harm. However these must be balanced against conservation goals regarding threatened species. Crowned eagles *Stephanoaetus coronatus* occupy urban landscapes of southern KwaZulu-Natal, South Africa. We identified negative incidents to human livelihoods, particularly predation on pets and livestock, and negative incidents to eagle livelihoods due to injuries, death, and nest disturbance. Citizen science involvement was developed with public awareness outreach, and this resulted in useful mortality and incident reports. Anthropogenic causes of harm are opportunities for active mitigation. Electrocution and gunshot wounds were identified as primary threats. Collision with structures, glass panes, vehicles and fence wires also impact crowned eagle survival. Time-lapse camera studies at urban nest sites demonstrated low rates of predation on livestock (6%) and pets (1%). Reported pet attacks were primarily by juveniles and sub-adults, and most occurred during winter months. Collaboration of wildlife authorities with NGO's and public stakeholder input creates an environment for successful crowned eagle conservation and management of human-wildlife conflicts. Active management and falconry-based rehabilitation processes can achieve a high standard of public support and conservation outcomes for human wildlife conflict concerning crowned eagles.

12.15 Raptor 3: Ralph Buij

How does land use and rainfall influence African migratory raptors breeding in the Sahel? .

We studied Grasshopper Buzzards *Butastur rufipennis* and African Swallow-tailed Kites *Chelictinia riocourii* at nests in natural and transformed habitats in the Sahel regions of Cameroon and Senegal to assess the effects of habitat transformation and rainfall on nest density, reproductive output, nestling diet and growth. At the landscape scale, Grasshopper Buzzard nest density increased with the density of preferred nest trees. Nests were more widely spaced in transformed than in natural habitat. Dietary differences reflected differences in prey availability around nests in natural and transformed habitats. Productivity and nestling growth rate were positively associated with rainfall but productivity was unaffected by land use because of the opposing effects of greater predation pressure, closer spacing of nests, and more food in natural habitat than in transformed habitat. Nest success of Swallow-tailed Kites was exceptionally low at 4% in Senegal, possibly related to a combination of suboptimal food conditions, high predation pressure, intraspecific aggression, and lack of experience among breeding pairs. Grasshopper Buzzard nestlings in natural habitat attained a higher mass than those in transformed habitats, suggesting that body condition at fledging was habitat-dependent. Although both migratory raptors cope with a degree of land transformation, continued widespread habitat transformation and diminished rainfall suggest deteriorating conditions.

12.30 Raptors 4: Megan Murgatroyd, Les Underhill, Arjun Amar

The impact of agriculture on the breeding performance, diet and conservation of the Verreaux's eagle

Understanding how species cope with agricultural transformation is of increasing importance within Africa. Specialist species are thought to be particularly prone to negative impacts of habitat change. In this study we explore how the Verreaux's eagle copes with agricultural transformation in South Africa. We monitored the breeding performance over four seasons from 2011-2014 in two areas; a natural mountainous area (the Cederberg) and an agriculturally developed area (the Sandveld). We also simultaneously collected information on the diet in both populations. Given the putative dietary specialization of the species, we predicted that eagles would be negatively affected by agriculture. In contrast to our expectations, the breeding productivity was 2.4 times higher in the Sandveld than the Cederberg. This resulted in stable long-term population predictions in the Sandveld, while it appears that the population in the Cederberg is unable to support itself without immigration. The diet was more varied in the Sandveld than the Cederberg, and nests with a more diverse diet exhibited a greater breeding performance. This trend was also present at a broader scale from previous studies across southern Africa. Although we cannot tell if these differences can be attributed directly to agricultural development or if they were present prior to transformation in the Sandveld, the eagles in this area appear to benefit from a more varied prey base and less rain during the breeding season.

12.45 Raptors 5: Petra Sumasgutner, Jessleena Suri, Eléonore Hellard, Sanjo Rose, Ann Koeslag, Arjun Amar

Street-wise: productivity, individual health, diet and prey abundance of Black Sparrowhawks (*Accipiter melanoleucus*) in a newly colonized urban population

Despite the rapid and global transformation of natural landscapes into urban environments, we still lack a clear understanding on how these developments impact ecological interactions and evolutionary processes. This is particularly true for predator-prey and host-parasite interactions and the influence of urbanization on individual animal health.

Urban birds may be exposed to prolonged stress; this may alter their body condition and parasite resistance. We explored if highly abundant avian prey might increase the reproductive output of an urban raptor and can buffer individuals from potential negative health impacts of novel urban stressors. We focus on the Black Sparrowhawk (*Accipiter melanoleucus*) and relate the timing of breeding, adult productivity and individual nestlings health (blood parasites, body condition and heterophils/lymphocyte ratios) to an urbanization gradient in Cape Town, South Africa. We found an interesting interaction term between the degree of urbanization and the timing of breeding, whereby early breeders produced more young in highly urbanized areas, but late breeders performed poorly in urban habitats. Surprisingly, no negative health impacts of urban nestlings were obvious. In fact for one blood parasite, *Leucocytozoon*, we found a positive association between the degree of urbanisation and infection, potentially because there are fewer habitats for this parasite's vectors available. We also found no change in diet composition, consistent with the finding that prey species of Black Sparrowhawks were equally abundant across different habitat types. Our findings help to understand the success of the species in this newly colonised urban environment.

DJOUDJ: Weaver research in Africa

11.30 Weavers Keynote: Dieter Oschadleus

The ecological significance of weaver nests

Weaver nests are well constructed and long lasting. This provides other birds and animals with opportunities to usurp active or old weaver nests to roost or breed in. Hence, they save on the energetic costs of nest building. Weaver nests have been shown to provide thermal buffering for birds under extreme temperature conditions, specifically in arid regions. Here the intra-specific nest use of weaver nests is reviewed, including the obligatory use of Sociable Weaver nests by Pygmy Falcons. In addition, there is a very long list of birds that use weaver nests and the frequency of nest use varies from single records to more regular use. Red-headed Finches and Cut-throat Finches are near-obligatory users of weaver nests for breeding. Chestnut Sparrows often usurp actively breeding weavers from their nests, and this is thought to be an evolutionary step towards brood parasitism. Cape Sparrows sometimes use Cape Weaver nests for breeding, this interaction being based on spatial and temporal constraints. The large nests of Sociable Weavers and buffalo weavers provide nest platforms for a wide variety of raptors, thus aiding threatened species. Woolly bats may roost in weaver nests which aids the conservation of these threatened bats. A variety of rodents also breed inside weaver nests, including *Dendromus* climbing mice.

12.00 Weavers 2: Anthony Lowney, Robert Thomson

Sociable Weaver nests as a resource to the Kalahari animal community

Ecosystem engineers create habitats by directly or indirectly modifying the availability of resources to other species. Sociable Weavers *Philetairus socius* builds massive nests that appear to be an important resource in this environment. This study investigates the use of these colonies by other species temporally across a year. We randomly selected fifty-two nests to be surveyed out of 250 weaver colonies mapped in our study area in Tswalu Kalahari, South Africa. Night visits determined what bird species use the nest for roosting and breeding, day visits visually assessed reptiles, and camera traps determined utilisation by mammals. In total, 87% of colonies hosted other bird species, including Acacia Pied Barbets, Scaly-feathered Finches, Ashy Tits and Pygmy Falcons.

There was a drop in species during breeding times. Cape Cobra, Kalahari Tree Skink and Turners thick-toed Gecko used nests for foraging, and mammal species used nests for shade, foraging and roosting. Sociable weaver colonies appear to be a valuable resource to vertebrate Kalahari animal communities. Ultimately we expect weaver nest importance will increase as this environment becomes harsher under global change.

- 12.15 Weavers 3: Colin Jackson, Fleur Ng'weno

Of undescribed weaver nests – the story of the hunt for breeding Clarke's Weavers

The breeding site and nest of the Kenyan endemic Clarke's Weaver *Ploceus golandi* had remained a mystery for 100 years. This species of forest weaver was described in 1913 from the north Kenya coast, but it was only after 12 years of active searching that the first breeding colony was found in March 2013 in a tiny wetland in the northern section of the Dakatcha Woodlands, north-west of Malindi. An estimated 400-500 nests were concentrated in a small area. Breeding behaviour and nest structure and design were noted and described. The nests of most weaver species have been described, but a few still remain a mystery. The story of the hunt for the Clarke's Weaver nest will be told, along with highlighting the nests of weavers that are as yet unknown.

- 12.30 Weavers 4: Adrian Craig

Iris coloration in weavers – is it a signal?

Iris colour in birds remains a neglected topic. There seem to be broad taxonomic patterns, and in some groups possible correlations with social organisation or ecology. Within the Ploceidae, the highly social sparrow-weavers (*Plocepasser*) and sociable weaver (*Philetairus*) show no sexual dimorphism in plumage or iris coloration, and retain a brown iris. The buffalo weavers (*Bubalornis*) are dimorphic in plumage, whereas *Dinemellia* is not, but iris colour is brown in all three species. Yet in *Pseudonigrita*, one species has a distinctive eye-ring (*P. arnaudi*) while in the other (*P. cabanisi*) the adult bird has a red iris. *Quelea*, *Euplectes* and *Foudia* all have brownish eyes with no age-related changes. But within the genus *Ploceus* there are species which are sexually dimorphic in iris coloration, and others in which both male and female have distinctively-coloured (red or yellow/white) eyes. Species in which the sexes differ in iris colour are often polygynous, whereas members of monogamous pairs have the same iris colour. Is this just an artefact of development, or does it signal information to other birds? Changes in pupil size in birds are under voluntary control, adding the possibility of varying the message.

- 12.45 Weavers 5: Nick Mundy

The genetic basis of red coloration in ploceids, estrildids and other passerines

Red coloration is commonly involved in sexual, social or interspecific colour signalling in birds. Highly chromatic ("bright") red integument (skin, scales, feathers) in birds is typically caused by ketocarotenoids, such as canthaxanthin, which are metabolically derived from dietary yellow carotenoid precursors. However, this key molecular mechanism underlying sexual dichromatism in birds, which is a key evolutionary innovation in birds, has remained obscure. Here we outline our recent discovery of a gene – CYP2J19 - that is responsible for red coloration in passerines, including multiple lineages of African ploceids and estrildids. High expression of CYP2J19 occurs in the liver of male ploceids with red nuptial patches, and in the red beak of male estrildids. Intriguingly, CYP2J19 is also involved in colour vision, and as a member of a large group of cytochrome P450 enzymes its involvement in red colour patches may signal detoxification ability. This new tool promises to shed much light on the ecology and evolution of red coloration in birds.

CASAMANCE: Cranes, wetlands and communities: Finding the balance in a developing world

11.30 Cranes Keynote: Kerryn Morrison, Jane Austin

Cranes and Agriculture: A delicate balance

The world's 15 crane species all utilize agricultural landscapes. Cranes have a digestive morphology and foraging ecology that is well suited to use crops, and agriculture has become a key driver for crane populations globally. There is a delicate balance between farming practices and the use that cranes make of crops – as staging areas to provide energy for long-distance migration through to raising chicks alongside wetland nesting areas. Agriculture has seen changes in spatial and temporal patterns as a result of both environment and agriculture development and changing practices. Cranes have responded to both the changes in land use and to evolving agricultural practices, resulting often in significant changes to crane populations. The delicate balance between cranes being seen as a benefit to the area, for instance for ecotourism opportunities, to apathy of their presence, through to conflict that results from crop damage, is a constantly evolving and intricate conservation challenge. Although a range of conflict mitigation options have been developed for commercial farmers, there is still a need for more options to reduce conflict in subsistence agriculture. Cranes and agriculture can co-exist, and the delicate balance maintained, if lessons from around the world are shared and adopted.

12.00 Cranes 2: Werner Schroeder; George Muigai, Eric Niyongabo

A status report on the existence of Grey Crowned Cranes (*Balearica regulorum*) in Burundi

In the course of developing an International Single Species Action Plan (ISSAP) for Grey Crowned Crane (*Balearica regulorum*) it became clear, that from some range states very little information on the present population trend was available. The data available for Burundi were based on a meta analysis of the late 1980th and even other older information. The country was going through times of civil war and had undergone dramatic changes in land use. A Grey Crowned Crane monitoring in Burundi was conducted in 2015.

12.15 Cranes 3: Richard Beilfuss, Griffin Kaize Shanungu, Kerryn Morrison

Wattled Cranes and large-scale floodplain conservation in south-central Africa

Vulnerable Wattled Cranes are increasingly concentrated on five large floodplain systems in south-central Africa—the Liuwa Plains, Kafue Flats, and Bangweulu Swamps in Zambia, the Okavango Delta in Botswana, and the Zambezi Delta in Mozambique now sustain >80% of the global population. Chronic food, water, and energy insecurity associated with rapid human population growth, grinding poverty, political instability, climate change, and other factors have conspired to reduce the distribution of Wattled Cranes across the region and threaten these remaining strongholds. Although each floodplain is formally protected, each faces a unique set of threats that embody our global conservation challenges. The future of Wattled Cranes on the Kafue Flats, for example, requires restoration of flooding patterns below large dams, control of invasive species and fires, and alternatives to geothermal and other energy development. The Liuwa Plains requires a balance between communal fishing and grazing activity and the nesting and feeding needs of Wattled Cranes. These challenges provide important opportunities for finding win-win solutions for cranes, other biodiversity, and human livelihoods on large floodplains, and for empowering lasting conservation leadership in the region.

12.30 Cranes 4: Inna B. Sané, Idrissa Ndiaye, Moussa Séga Diop, Tim Dodman

Reproduction de la grue couronnée *Balearica pavonina pavonina* en Casamance, Sénégal

Les travaux de terrain ont été effectués dans les zones de Baïla et Koussabel en Casamance (Sénégal) du 20 août au 1er octobre 2014. Ils ont permis de caractériser les habitats et de suivre la reproduction de la grue couronnée *Balearica pavonina pavonina* de la ponte à l'éclosion des oeufs. Les espèces ligneuses de la zone d'étude présentent une dominance d'*Avicennia africana* et les espèces *Ceiba pentandra*, *Detarium senegalensis* et *Rhizophora mangle* sont celles qui sont les moins représentées. Cependant la dégradation de la mangrove due au déboisement et à la salinisation des sols constitue une réelle menace pour les sites de nidification de la grue. Pour la reproduction, 14 nids occupés ont été identifiés et suivis au niveau des sites Koussabel, Baranlir et Baïla). Ces nids ont des diamètres variant de 40 à 100cm et ne sont pas équidistants. La taille de ponte est 2 à 4 oeufs. Le succès de reproduction à l'éclosion est en moyenne 62,5% pour un total de 32 oeufs. Les risques de destruction accidentelle des nids et de perturbations des nicheurs sont réels car les périodes de culture du riz coïncident avec celle de nidification des grues.

- 12.45 Cranes 5: Shimleis Aynalem, Tariku Mekonen, Abebayehu Aticho, Günter Nowald, George Archibald, Hadis Tadele

Cranes, Wetlands, their Conservation Status and Threats in Ethiopia

In this paper we assessed: (1) the distribution and population status of cranes. Four species of cranes occur in Ethiopia. The Black-crowned and Wattled cranes (residents) and Eurasian and Demoiselle cranes (migratory). Except the later one all cranes are distributed in Lake Tana, Rift valley, and southern parts of Ethiopia. Their actual population is estimated 2000-3000, 250-350, 70000-75000, respectively. While the Demoiselle cranes are only restricted in the northwestern corner of Ethiopia. Though they are passage migrant, 21000-22000 were recorded in 2011. Detailed studies of all cranes are limited but now underway. (2) Nesting sites and major threats. In Lake Tana area nesting sites are found in most specific areas; however, in the southwest and Bale Mountains, nests are in widely-scattered isolated wetlands and islands. Most of the resident cranes breed during August-December, but could extend to February in some places. The depth of water in the wetland and availability of proper vegetation cover is important. (3) Wetlands of crane's habitats and their conservation: most wetlands are found along rivers. However, they are being degraded. Water draining and agricultural encroachment are main threats. All wetlands are unprotected but they are essential for the survival of the cranes. Human pressure is main threats of cranes and wetlands. Awareness creation, sustainable wetland utilization and management practice should be carried out.

Monday 17th October 2016: 14.00-15.15

AMPHITHEATRE SINE SALOUM: Migration strategies in Africa; two sides to the story (Part 1)

- 14.00 Migration Keynote: Kasper Thorup

Migration strategies: Intra-African versus Afro-Palearctic migrants

Many bird species perform seasonal movements. Large numbers of birds from the Palearctic winter within Africa and many move considerable distances during their stay. Many African-breeding species move seasonally as well. In general, only little is known about

the movements within Africa. Detailed mapping of spatiotemporal movement schedules has recently become possible using the newest tracking technology, including satellite tracking and geolocators. Focussing on the results from such tracking, I will present a status of our knowledge on the movements within Africa comparing intra-African and Afro-Palearctic migrations and how they fit together. Similarities and differences in behaviours such as diurnal or nocturnal travel as well as control of migration can be assessed for these systems. An evaluation of the potential importance of stopovers and routes is crucial for our understanding of migration strategies and I will also focus on knowledge of overall ecology of migration such as whether migration in itself is dangerous, if migratory species are under special risk and carry-over effects. Recent full annual cycle mapping of migration has revealed often fine-tuned, complex migration schedules allowing an emerging understanding of the link between seasonally changing resources and birds' movements. Knowledge of drivers and control of migration are of utmost important for the conservation of all migrants especially in the face of large-scale global change.

- 14.30 Migration 2: Soladoye Iwajomo, Mikkel Willemoes, Ulf Ottosson, Roine Stranberg, Kasper Thorup

Intra-African Migration of the African Cuckoo *Cuculus gularis* and Black Coucal *Centropus grillii*

Despite many bird species migrating regularly within the African continent, in response to rainfall and breeding opportunities, very little is known about Intra-African movements, especially at the individual level. Here we use satellite telemetry to document the year round movement of two intra-African migrants, the African Cuckoo *Cuculus gularis* and Black Coucal *Centropus grillii* breeding in the savanna zone of sub-Saharan Africa. After breeding in central Nigeria, the African Cuckoos migrated to more forested sites in the Adamawa region of Cameroon (n=2) and western Central African Republic (n=1). The total distance covered was on average 748 km in 66 days during the post-breeding migration and 744 km in 27 days during return journey with considerable individual variation and with more stopover sites used during post-breeding migration. The Black Coucal however migrated from central southern Nigeria where it bred, to the rainforest of the Niger Delta region of Nigeria (n=1), covering a total distance 225 km in 30 days during the post-breeding migration and 184 km in 2 days during return journey. Migratory movements generally occurred during dark hours. For the African Cuckoo, the diversity of migration routes followed suggests a relatively flexible initial migration strategy, high individual route consistency as well as high fidelity for final stopover sites.

- 14.45 Migration 3: Nina Seifert, Martin Haase, Steven L. Van Wilgenburg, Christian C. Voigt, Angela Schmitz Ornés

Complex life-cycle strategies in the Baillon's Crake illuminated by genetic and isotopic markers

Unlike the annual bi-directional movements of many bird species within the Palaearctic-Afrotropical region, irregular movements such as irruptive migration with low philopatry are reported for a variety of species depending on highly seasonal resources. These flexible movements allow for itinerant breeding - consecutive breeding in geographically different regions during the same annual reproductive cycle. In order to illuminate migratory and breeding strategies of the wetland species Baillon's Crake *Zapornia pusilla* across the Palaearctic-Afrotropical region, we used DNA-microsatellites as well as $\delta^{2}\text{Hf}$ -values of individuals sampled in African and European breeding sites. We investigated the degree of genetic population structure and assigned individuals' feathers of unknown origin to their probable moulting site using a likelihood approach. We found three genetic clusters, differentiating into one "European" and two "African" populations. Connectivity

between the sampling sites was probable as genetic “African” individuals were found in breeding conditions in Europe and vice versa. Likewise, assigned moulting locations based on $\delta^{2}\text{H}$ isoscapes suggested trans-continental movements as well as moulting and breeding by the same individual both in Africa and Europe. Both isotopic and genetic data reveal the Baillon’s Crane pursue a complex migration and breeding strategy, allowing as well for irruptive movements and itinerant breeding across the W-Palaeartic-Afrotropical region.

- 15:00 Migration 4: Nwaogu Chima Josiah, Shiiwua A. Manu, Boniface O. Agbo, Z. Bitrus, Ulf Ottosson, Samuel T. Ivande

Status of the intra-African migrant Rosy Bee-eater *Merops malimbicus* in Nigeria

The Rosy Bee-eater *Merops malimbicus* is an obligate breeder on riverine sandbars with northern and southern breeding populations endemic to Africa. Breeding records for the northern population are restricted to the River Niger and its tributaries in Nigeria where they migrate to breed in large aggregations at the start of the wet season. Its obligate use of seasonal sandbars on rivers means that very little is known about its breeding ecology and migration. A reconnaissance of historic breeding locations (visited 1942 and 1965) in April 2013 found only one active breeding colony, near Eggan - c.8 km south-east of Katcha, Nigeria. On-going studies in this area indicates that birds returned to breed from end April to early August in 2014 and 2015, although colony size differed between years. Lepidoptera and Odonata were the most observed prey items in their diet. The colony was attacked by several predators and the Greater Honeyguide Indicator indicator was also confirmed as a brood parasite of the Rosy Bee-eater. The River Niger and its surrounding areas are currently disturbed by anthropogenic activities which may influence the seemingly predictable seasonal availability of sandbars thus putting this obligate breeder in critical danger of massive breeding population loss.

DJOUDJ: Maximising the value of atlas projects: Harnessing citizen science as an environmental early warning system (Part 1)

- 14:00 Raptors 6: Stéphanie Razakaratri

Habitat features, and threats of the Bat Hawk *Macheiramphus alcinus anderssoni* in Western Madagascar

The Bat Hawk is an exception among the Accipitridae family. Bats are their main prey and they remain inactive during the daylight hours. Some information on their habitat is however lacking. We conducted more investigations in Mandrozo area. Five nesting sites were analysed in 2015. We calculated the dendrometry, the canopy cover and took the species name of each tree within 1Ha around the nest tree. We also estimated the fidelity of each pair in their area and threats from direct observations. The nest is located in secondary forest surrounded by fields and palm trees forests (n = 4). Trees analysed were 5 to 25m high and 77,84% of them had a diameter between 10 to 50cm (n = 158). The dominant tree was the fig tree *Ficus pachyclada*. Four of the five nests were built on that dominant species. In general, individuals showed high fidelity to their nesting area. Three pairs stayed in the same area for 6 years. Main threats on their habitat were human action and cataclysm natural.

- 14:15 Raptors 7: Gilbert Razafimanjato, Lily Arison Rene de Roland, Donatien René Randrianjafiniasa

Monitoring of Madagascar Fish Eagle *Haliaeetus vociferoides* in the western part of Madagascar

We surveyed the breeding biology of the critically endangered Madagascar Fish Eagle inside and outside of Tsimembo Manambolomaty Protected Area (PA), between 2010 and 2015, in the western part of Madagascar. We aim to compare the breeding success of both sites and to assess threats on the habitat. We surveyed 14 and 13 breeding pairs respectively inside and outside the PA. Most of the pairs at the PA are polyandrous. We visited three times a year all existing nests. The first visit occurred in June to verify egg's number. The second visit happened in August to check nestling and the last visit was in October to verify fledgling success. During six years, 101 eggs were laid at the PA of which 60 were hatched and 58 juveniles were fledged. We recorded 62 eggs at the satellite lakes of which 39 were hatched and 36 were fledged. The breeding success seems to be similar at both sites, 0.84 (58/69) against 0.76 (36/47) and threats were low thanks to the management system.

14:30 Atlas Keynote: Julius Arinaitwe, Ademola Ajagbe

Harnessing Citizen Science as an Environmental Early Warning System

Every year, large numbers of people around the world get involved in conservation as volunteers, providing valuable additional resources and conservation knowledge to organizations such as those in the BirdLife Partnership. For example in Denmark, IBA Caretakers use the DOFbasen, an online database of bird observations covering the entire country, to monitor and report on Special Protection Areas across the country. In UK, monitoring common birds provides information that is used in monitoring one of the headline quality of life indicators. In Southern Africa, the Southern African Bird Atlas Project 2 (SABAP2), which started in 2007 is assembling bird observations at a fine level to paint the best possible picture of bird distributions in the region. Atlassing projects are taking place in many other countries, relying on the inputs of volunteers. Several objectives are essential in maximizing the value of Citizen Science based programmes to serve as an early warning system for biodiversity. These objectives include: understanding species response and adaptation to climate change (with citizen science data inputting to modeling and monitoring projections), generating new knowledge, and enthusing membership and broadening constituency. This presentation focuses on these objectives, as well as the influence of Citizen Science on sustainable living. I offer some recommendations for enhancing the use of Citizen Science in conservation of Africa's immense biodiversity.

13:00 Atlas 2: Fleur Ng'weno

45 years of public bird walks in Kenya

Since February 1971, the Wednesday Morning Birdwalks have met at the National Museums of Kenya in Nairobi at 8:45 am, shared transport, and visited the green spaces of the city. Started by Fleur Ng'weno as a volunteer under the auspices of the East Africa Natural History Society, the birdwalks are now part of the Nature Kenya calendar. This presentation will discuss the factors that have kept the birdwalks going for 45 years, including: Nairobi's high avian diversity, more than 600 species; wide choice of venues, including three that can be reached on foot; dependability – the birdwalks meet each week, rain or shine; the combination of volunteer leaders and institutional support; and the enthusiasm of leaders for going birdwatching.

CASAMANCE: Shorebird populations and global environmental change

14:00 Shorebirds Keynote: Theunis Piersma, [Jan A. van Gils](#), Thomas Oudman

Shorebirds incur the cost of rapid Arctic warming while wintering in West Africa.

Red knots (*Calidris canutus canutus*) migrate between their summer breeding grounds in the high Arctic and their wintering grounds in the West African tropics. Chicks born under rapidly warming conditions in the Siberian Arctic attained smaller sizes before migration starts, and we argue that this is because they missed the insect peak. Those that make it to their wintering grounds at Banc d'Arguin intertidal flats, are faced with a second disadvantage: their shorter bills hamper their ability to reach their favourite shellfish and have to either rely on a toxic alternative or on sea grass rhizomes. We show that the lower survival of short-billed juveniles generates an evolutionary force towards smaller-sized birds with relatively large bills.

14:30 Shorebirds 2: [Yaa Ntiama-Baidu](#), Jones K. Quartey, Alfred Ali Nuoh

Long-term trends in populations of Herons and Egrets in coastal Ghana

Long-term counts are critical for understanding waterbird population trends and the impact of factors such as climatic variability and anthropogenic environmental changes (e.g., habitat degradation) on bird populations. We present population estimates of herons and egrets in coastal Ghana and analyse trends based on a unique set of data spanning three decades. Herons and egrets were counted monthly from 1986–2015 on 13 wetlands as part of a long-term monitoring of the ecological character of Ramsar sites. Twelve species of herons and egrets were recorded, with six (Reef, Grey, Squacco and Black herons and Little and Great white egrets) being the most common. Three wetland sites, Keta Lagoon, Sakumo Lagoon and Densu Delta, together consistently held 60-80% of total sightings; bird numbers peaked in September/November. Analysis of the population trends of the most abundant species showed moderate to steep declines for the Little egret, Grey heron, Great white egret and Squacco heron, while Reef heron and Black heron populations remained stable ($p < .05$). We discuss the role of climatic variation and habitat degradation in driving the observed population trends and propose further species specific ecological studies for better understanding of the factors regulating heron/egret populations in coastal Ghana

14:45 Shorebirds 3: [Jeroen Reneerkens](#), Yaa Ntiama-Baidu, Gunnar Thor Hallgrimsson, Tom Versluijs, José Alves, Peter M. Potts, Mark Boorman, Ron Porter, Theunis Piersma

Fitness consequences of differential migration strategies in Sanderlings.

By seasonal migration, birds use the best of two worlds and occur at far apart locations during the seasons with maximal abundance of resources. Within species, individuals using the same breeding location, can exhibit varying migration strategies that result in largely varying individual life histories. Differences in cold endurance, predation risk and food availability between sexes have been shown to explain differential migration in sexually dimorphic species. High Arctic breeding Sanderlings *Calidris alba* are only marginally sexually dimorphic. Sanderlings spend the non-breeding season along shores that vary sixfold in distance from the breeding grounds and that vary largely in ecological conditions. There is no evidence for sexual segregation during the non-breeding period in Sanderlings. We used capture-mark-recapture analysis and geolocators of Sanderlings at three European and three African non-breeding locations at varying distances from the breeding grounds. Our result suggest consistent differences in annual survival, timing of spring migration and age of first breeding. Ecological conditions, pre-departure from the non-breeding locations, rather than the length of the annual flights, may be a bottleneck especially for Sanderlings that spend the non-breeding season in west Africa.

15:00 Shorebirds 4: Jones K. Quartey, Alfred A. Nuoh, Emanuel N. A Taye, Yaa Ntiama-Baidu
Population dynamics of black-winged stilt *Himantopus himantopus* in Ghana.

Global populations of several species of shorebirds are under serious threat, with 48% of the known 207 populations in decline. The presence, absence and population dynamics of waterbirds help to explain the state or the ecological character of the environments within which they live. Habitat and climatic changes have been implicated to be the major extrinsic factors defining changes in waterbird populations. The Ghana coast supports several species of migratory birds during the non-breeding season as well as resident species. This study looks at the population dynamics of the black-winged stilt *Himantopus himantopus*, on 13 coastal sites monitored over a period of three decades. Trend analysis using the TRIM statistical software generated an overall slope model describing a moderately increasing population ($p < 0.01$). The two lagoons associated with the Volta River (the Songhor and Keta lagoons) accounted for more than 75% of the total counts. These two sites have been observed to complement each other in supporting populations of waterbirds during extreme environmental stress. For example, the decline in number of the species in the 1990s from 17,000 to 1,032 at the Keta Ramsar site was accompanied by an increase from 660 to 11,500 individual at Songhor Ramsar site in the early 2000s. We observed that the variations in populations of black-winged stilt on the Ghana coast is influenced by climatic factors (rainfall), habitat changes and breeding success.

Monday 17th October 2016: 15.45-17:15

AMPHITHEATRE SINE SALOUM: Addressing the declining fortunes of migratory waterbirds of Africa's East Atlantic Flyway

15:45 Flyway keynote: Geoffroy Citegetse

Working together to conserve migratory birds along the East Atlantic Flyway

Each year, millions of migratory waterbirds travel from the breeding sites in Europe to the wintering site in Africa to complete their biological cycle. They use the East Atlantic Flyway from Arctic to South Africa. A large proportion of these birds depend on a network of wetlands along the flyway which play a crucial role as breeding places, stopover sites and wintering grounds, they are also important for livelihood and culture of people. Some key sites are found in West Africa (Banc d'Arguin, Bijagos, ...). However, along the flyway, these important sites are threatened by human activities such as land reclamation, fisheries, industrial pollution, and climate change. To address the threats to the migratory birds, cooperation along the flyway is needed. BirdLife International, Wetlands International, AWEA and Wadden Sea Flyway Initiative joint their effort through the Conservation migratory birds Project (CMB) to strengthen the NGO-government partnership for migratory bird conservation along the coast of West Africa. The networks were improved through monitoring and conservation actions. Monitoring of birds in the region was improved, with more people trained and engaged and better coordinated. Local communities were involved in birds monitoring and conservation actions at sites especially restoration of migratory birds habitats.

16:00 Flyway 2: Lemhaba Yarba Ahmed Mahmoud

Le rôle du Parc National du Banc d'Arguin (PNBA) pour les oiseaux migrateurs

Le Parc National du Banc d'Arguin (PNBA), est considéré parmi les zones côtières les plus productives de l'Atlantique Nord Est. Il est l'une des régions les plus importantes pour les oiseaux sur la côte Ouest-Africaine. C'est un site d'hivernage pour plus de deux millions de limicoles et autres oiseaux de rivage et un site de nidification pour différents groupes d'oiseaux (Spatules, flamants, Sternes, etc.). Ces oiseaux dépendent de l'abondance des ressources halieutiques et de la zone intertidale où se trouve les herbiers. Ceci rend le PNBA l'une des zones d'hivernage où se trouve la plus forte densité d'oiseaux de rivage dans le monde. Pour la conservation et la bonne gestion des risques et menaces qui pèsent sur les oiseaux migrateurs le PNBA a mis en place un réseau de partenariat avec des institutions de recherche, des organisations internationales et des sites du patrimoine similaires comme la Mer de Wadden où hivernent et transit les populations d'oiseaux. Lors de cette communication, l'accent est essentiellement mis sur le rôle du PNBA, les menaces et le partenariat.

16:15 Flyway 3: Khady Gueye, Cheikh Tidiane Ba, Papa Ibnou Ndiaye

Dynamic of the black-tailed godwit, *Limosa limosa* and fidelity to Senegalese wintering grounds.

The population of black-tailed godwits, *Limosa limosa limosa*, breeding of Western Europe that winters in West Africa is declining. The black-tailed godwit is near threatened species and is currently the subject of a plan of international actions of AEWA and national. However, there are few data on the distribution of birds counted in January, when a large part of the population is expected back in the West. The main purpose of this study is to know the ecology and biology of godwit. The specific objectives are to know the phenology and the movements of the bird in the Senegalese wintering sites. We make statements bird found in each site, and a reading of color combinations and rings (or) flag banded individuals. We send the banded codes to manager databases. The presence of *Limosa limosa* is recorded from June to January from which the numbers begin to decrease. Distribution dynamics within Senegalese habitats is now well known with the maximum in October. The black tailed godwits are very loyal to their wintering sites for Senegalese individuals banded comments are repetitive since 2012. Indeed by this reading of the rings, the movements of godwits in the Senegalese wintering area are revealed.

16:30 Flyway 4: Miguel Xavier

La protection de la Baie de Mussulo pour la conservation des oiseaux aquatiques

La Baie de Mussulo représente une zone importante pour un grand nombre d'oiseaux aquatiques, autant des résidents bien que les migrateurs paléarctiques. Dans le passé, elle a été considérée comme une zone primordiale pour l'avifaune, ce qui a emmené la création de Réserve Intégrale « do Ilhéu dos Passaros » en 1973. Cette dernière et d'une manière générale toute la baie de Mussulo n'ont plus bénéficié de quelques types de suivie de l'avifaune. Cette situation a emmené à la diminution significative de la population avifaunistique, mais aussi à la disparition de certaines espèces. La Réserve qui par le passé était considérée comme une zone de nidifications des certaines espèces, est aujourd'hui occupée par quelques groupes des pêcheurs qui déséquilibrent ce milieu et empêchent la nidification. Le dragage de la baie et l'accumulation des déchets représente aussi un danger permanent pour la survie de l'avifaune dans cette baie. Le récent comptage réalisé a montré qu'il y a une forte espérance pour la survie de l'avifaune dans ce milieu si des efforts de conservation pouvaient être faites. Nous avons pu compté plus 3.000 individus et quelques 45 espèces qui incluent les oiseaux nocturnes et certaines espèces rares.

DJOU DJ: Maximising the value of atlas projects: Harnessing citizen science as an environmental early warning system (Part 2)

15:45 Atlas 3: Marshall Iliff, Chris Wood, Brian Sullivan, Ian Davies

eBird: Mobilizing birdwatching data for science in Africa

eBird is an observational database built for birders, researchers, and conservationists. Global participation includes 100s of partnerships, 35 regional portals, 300,000 users, and 301+ million records, with over 81,000 complete checklists from Africa spanning all countries. The ever-growing community is motivated by real-time rewards, including bird-finding tools, species distribution information (e.g., maps), bird-listing games, and the ultimate free bird record-keeping software. eBird's scientific foundation puts these data to use for research, conservation, and education. Unlike most observational databases, eBird incentivizes complete checklists—including all species recorded—which allows inference of species absence. Incentives promote counting all species, standardized survey protocols, and descriptions of effort, all of which add scientific value to the data. The inclusion of effort with complete checklist data allows for estimates of species abundance and population trends across multiple spatiotemporal scales. Over 45,000 raw data downloads and over 120 peer-reviewed publications using eBird data are thanks to its completely open and free data access policy. Exciting opportunities abound in Africa, and eBird's international platform (20+ languages so far) is built to allow rapid adoption and customization by new partners around the world, supporting local organizations to reach their goals.

16:00 Atlas 4: Henk Nel

BirdLasser: The atlassing app by Africans, for Africa

BirdLasser is fun for birders and good for birds. Whether a casual bird watcher or fanatical twitcher, BirdLasser is a fun way to record your sightings and share with friends, your community and contribute to conservation – enabling all users to become citizen scientists. Initially launched for the Southern African sub-region, specifically catering for the atlas community in the region, contributing to the Southern African Bird Atlas Project 2, BirdLasser has slowly gained momentum and started its reach to other regions like Kenya. To cater for the African market meant addressing key challenges – high cost of mobile data and lack of cellular coverage being top of the list. Other innovations that has helped BirdLasser build a passionate and loyal following are the creation of advisory boards (users help decide the priorities of future features), the introduction of gamification (events, challenges and list keeping), direct collaboration with research and conservation bodies, and a focus on service delivery rather than product ownership

16:15 Atlas 5: Nick Moran, Andy Musgrove

BirdTrack: mobilising birders' records for Atlas projects.

BirdTrack is a global tool for birders to record, store, share and explore their sightings. Freely available online and through iPhone and Android smartphone applications, it is designed for easy, flexible data entry and engaging outputs. With tens of millions of records already entered from around the world, BirdTrack is also a rapidly growing database with increasing relevance to a range of bird conservation issues. Built and run by BTO, on behalf of a partnership of organisations, Atlas compatibility has been integral to BirdTrack development. More than 4.5 million BirdTrack records were used in the Bird Atlas 2007–11 project in Britain and Ireland. New features have since been added to further increase its value as a way of submitting observations with breeding evidence for the second European

Breeding Bird Atlas. Ongoing collaborations will ensure that BirdTrack data also contribute to national and cross-continental Atlas work in Africa. Strong, networked communities of individual observers and local bird recorders are another core element of BirdTrack and an essential component of successful Atlas projects.

16:30 Atlas 6: Sam Ivande, Talatu Tende, Ulf Ottosson

Nigeria Bird Atlas Project (NiBAP): Mapping Nigeria's Birds.

The Nigerian Bird Atlas Project (NiBAP) is an initiative of A.P Leventis Ornithological Research Institute (APLORI), Jos, Nigeria with technical support from Animal Demography Unit, University of Cape Town, South Africa. NiBAP aims to update information on distribution of birds and publish a bird atlas for Nigeria. The project hopes to achieve this with help and valuable input from volunteer members of the public keen to contribute to bird conservation (citizen scientists) in Nigeria. By encouraging participation of citizen scientists, NiBAP hopes to improve local capacity and increase conservation/environmental awareness. Methodology for NiBAP is adapted from the Southern Africa Bird Atlas Project (SABAP2). Nigeria has been gridded along lines of latitude and longitude and the smallest grid square is a pentad - the unit of data collection measuring 5' x 5' (c. 9km x 9km). There are about 11,600 pentads across Nigeria and Atlas protocol involves spending a minimum two hours in a pentad and visiting as many habitats as possible to record every bird species in the order of encounter on a list. A protocol once started can be completed within five days. Data is submitted through the homepage (www.nigeriabirdatlas.adu.org.za). Start-up funding was provided by SkandinavKonsult, Sweden to support preliminary fieldwork for data collection which started since January 2016 by a small team of 3 individuals including the project coordinator, manager and assistant. Though challenging, volunteers are gradually been recruited, some of whom now regularly contribute to the database. Additional funding is being sought to support continuous data collection by the core team and to embark on massive workshops/awareness campaigns to introduce this methodology and promote volunteering culture for citizen science in Nigeria.

16:45 Atlas 7: Colin Jackson

The potential and challenges of Citizen Science in African biodiversity conservation

Citizen Science has been around for a long time in the form of skilled, amateur volunteers contributing data to scientific research though the name 'Citizen Science' ('CS') was first coined in the mid-1990s and only entered the Oxford English Dictionary in June 2014. In African ornithology, well-known CS projects include a variety of bird atlases across the continent, nest recording and ringing schemes. With the advent of widely accessible digital imagery, higher speed internet and particularly more recently smart phones linking to the internet that have geo-positioning functionality, the opportunities and potential for involving citizens in scientific data collection has increased exponentially – and the diversity and number of such projects has consequently mushroomed. This presentation will explore the variety of such projects in Africa and seek to address the key benefits and challenges they present for biodiversity conservation and consider questions such as: Should we encourage new projects to emerge in the same field or slim down to just one or two? What are the overall aims of avian CS projects, can we harness the best in each one and use technology to share data more effectively? Who owns the data – should it be 'owned'? What is the way forward for CS in African avian studies?

CASAMANCE: Migration strategies in Africa; two sides to the story (Part 2)

- 15:45 Migration 5: Samuel Temidayo Osinubi, Desire Dalton, Monica Mwale, Phoebe Barnard, Peter Ryan, Greg Budney

Variation in vocalisation patterns of intra-African migrant landbirds across sub-Saharan Africa

The study of vocalisation in animal behavioural ecology provides potential insight into intra- and inter-specific interactions, cultural transmission of information, and evolutionary adaption that is indicative of sympatric speciation. Working primarily with archived recordings of intra-African migrant cuckoos, kingfishers and bee-eaters from across western, eastern and southern Africa, we are assessing variations in frequency- and time-based acoustic parameters. Preliminary results indicate a time-based variation in the duration of the trill portion of the call of the male Woodland Kingfisher, *Halcyon senegalensis*. Field observations suggest a longer trill indicates dominance or greater fitness. However, this is still being empirically tested. This project is part of a larger on-going study into migration connectivity and sub-species variation across sub-Saharan Africa.

- 16:00 Migration 6: Onoja Joseph Daniel, S.T. Ivande, S.A. Manu, W. Cresswell

Migration of Abdim's Stork: raising awareness of climate change and connectivity within Africa

Abdim's Stork (*Ciconia abdimii*) have iconic status as harbingers of rainfall; farmers in Sahelian villages observe the timing of their movements as signals for the start of rains resulting in a strong link between people, the storks and the changing seasons. This species therefore presents both research opportunities to better understand the impacts of the changing climate on intra-African migration phenology of some biodiversity and conservation awareness opportunities, considering the already established cultural links between people and these storks which are welcomed as valuable visitors. We report results from an on-going monitoring programme of a population of Abdim's storks in Northern Nigeria. A population size of at least 538 birds was surveyed from 77 villages in Northern Nigeria in 2012. Nests were only found within villages and never outside, underscoring the strong links between people and the species. To understand migratory movements and connectivity, a total 145 birds were tagged (133 colour-tagged chicks from the nests and 12 geolocator-tagged breeding adults) between 2013 and 2015. Although monitoring is still on-going, results so far highlight interesting details about the breeding ecology of these species including information on possibilities of juvenile dispersal, because no colour-tagged birds have been re-sighted 3 years on.

- 16:15 Migration 7: Alison Beresford, Graeme M. Buchanan, Paul F. Donald, Fiona, J. Sanderson, Juliet A. Vickery

Assessing the impact of winter land cover changes on Afro-Palearctic migrants

Declines in populations of Afro-Palearctic migrant birds are well documented, yet the role of changes in wintering habitats in these declines is poorly known. Here, we assess the potential importance of changing winter conditions using two approaches. First, using data on tree cover extent since 2000, we assess changes in tree cover within the ranges of forest-dependent species and relate these to changes recorded in their European breeding populations. Second, we analyse long-term (1981 – 2014) trends in climate and phenology variables derived from remotely-sensed data, identifying hotspots of change. By quantifying changes within species' ranges and relating these to temporal patterns of change in European breeding populations, we are able to assess the relative importance of climate-related and land use or land cover-related changes in phenology for individual species. Improving our understanding of the role of land cover change in wintering areas on

migrants allows more targeted policy and advocacy to be developed on the ground, as well as directing and focusing future research.

- 16:30 Migration 8: Catriona Morrison, Jennifer A. Gill, Simon Butler, Robert A. Robinson, Jacquie A. Clark

Seasonal interactions and rapid population declines in Afro-Palaeartic migratory birds

Recent, rapid population declines in long-distance migratory bird populations, particularly those wintering in the humid tropics of sub-Saharan Africa, have implicated environmental changes in their wintering grounds. However, substantial within-species variation in population trends across breeding ranges suggests that breeding ground processes could also be involved. There is a pressing need to identify the contribution of breeding and non-breeding season processes to these population declines, in order to target conservation action and resources appropriately. In order to address this we use census data (PECBMS) to explore the extent of spatial co-variation in species with differing migration strategies across Europe. We then use integrated population models to demonstrate for one species, the willow warbler, how combining these trend data with information on productivity, from nest monitoring schemes, and adult survival, from constant effort site ringing, can reveal the demographic processes underlying these patterns and the most fruitful way to reverse population declines.

- 16:45 Migration 9: Steven W Evans, Elizabeth M Baker, Neil E Baker, Dirk Cilliers

Current distribution and population size of the Blue Swallow in the southern Tanzanian highlands

Surveys of Blue Swallows were conducted in the southern Tanzanian highland grasslands in order to determine the habitat preferences and estimate the size of this subpopulation. The Blue Swallows showed a preference for natural pastures and for rural villages interspersed with crops and natural pasture. The buildings in the rural villages provide the nesting sites and, in close proximity, the crops, natural pastures, livestock and their dung possibly provide the food source for the aerial arthropods on which the Blue Swallows feed. In total, 151 Blue Swallows were recorded at 62 localities, within the maximum perpendicular distance of 262 m on either side of the survey route. These data along with environmental variables were used to construct an ecological niche model for the Blue Swallow. It was estimated that a mean of 12 791 km² of suitable habitat was available for Blue Swallows. A subpopulation of 1 014 (338 to 507 pairs) Blue Swallows was estimated to inhabit the southern Tanzanian highland grasslands (12 791 km²). Mean densities were 0.023 to 0.035 pairs km⁻². A density of 0.13 pairs km⁻² recorded on a cattle farm consisting primarily of grasslands and wetlands was similar to the density of pairs found on sites in South Africa and Swaziland of comparable size and with matching characteristics. Based on this new information the global Blue Swallow population estimate is updated to between 1 169 and 1 338 pairs.

Tuesday 18th October 2016: 10:00 - 11:00

AMPHITHEATRE SINE SALOUM: Vultures in Africa (Part 1)

- 10:00 Vulture 1: Campbell Murn, Peter Mundy, Munir Z. Virani, Wendy D. Borello, Graham J. Holloway

Using Africa's protected area network to estimate the global population of the White-headed Vulture

The White-headed Vulture (WhV) is largely restricted to protected areas across sub-Saharan Africa. We used the World Database on Protected Areas to identify protected areas (PAs) likely to contain WhVs. Vulture occurrence on road transects in Southern, East and West Africa was adjusted to nests per km² using data from areas with known numbers of nests and corresponding road transect data. Nest density was used to calculate the number of WhV nests within identified PAs and then extrapolated to estimate the global population. Across a fragmented range, 400 PAs are estimated to contain 1893 WhV nests as follows: Eastern Africa 721 nests, Central Africa 548 nests, Southern Africa 468 nests and West Africa 156 nests. Including immature and non-breeding birds the estimated global population is 5528 birds. The identified distribution is alarming: over 78% of identified PAs contain fewer than five nests. A further 17% of PAs contain 5 - 20 nests and 4% of identified PAs contain >20 nests. Just five (1%) of PAs are estimated to contain >40 nests; none is located in West Africa. Ranging behaviour of WhVs is currently unknown but 35% of PAs holding >20 nests are isolated by >100 km from other PAs. Spatially discrete and unpredictable mortality events such as poisoning pose major threats to localised vulture populations and will accelerate ongoing local extinctions. Actions that reduce the impact of poisoning events and promote linkages between protected areas should be pursued.

10:15 Vulture 2: Keith L. Bildstein, Lindy Thompson, Andre Botha, Marc Bechard, Clive Barlow, Mawdo Jallow, Evan Buechley

Regional differences in the movement ecology of Hooded Vultures in West, East, and southern Africa

Hooded Vultures are obligate scavengers that range across much of West, East and southern Africa. The movement ecology of the species, which is a human commensal north of but not south of the equator, is largely unknown. We satellite tracked the monthly movements of 15 juvenile, sub-adult, and adult Hooded Vultures in The Gambia, Ethiopia, and South Africa for a total of 24 bird years in 2013-2016. Sizes of the monthly home ranges of each bird were compared both within and among individuals to assess seasonal and regional differences in the movement ecology of the species. Consistent seasonal shifts in home-range size did not occur, but the sizes of home ranges in regions where the species is a human commensal were consistently smaller than in regions where the species is not a commensal. We discuss the extent to which the sizes of the ecological neighborhoods of the species is related to a commensal lifestyle and how this, in turn, is associated with local population densities and the local conservation status of this globally Critically Endangered species.

10:30 Vulture 3: Rob A.G. Davies, Ralph Buij, Darcy Ogada, Campbell Murn, Corinne J. Kendall, Munir Z. Virani, E.A.C. Brouwer, Clive Barlow, H. Azafzaf, Andre Botha

Early Use of the African Raptor Databank to Inform Conservation Actions for African Vultures

The African Raptor Databank (ARDB) has grown rapidly since inception at PAOC 13 in Arusha, October 2011. This is thanks to the support of hundreds of raptor observers across the continent and coordination by key individuals. A total of 144k records has been assimilated including 16k historical records from the Snow Atlas, 25k observations from two major Bird Atlas projects, 67k from spreadsheet submissions and 36k through innovative mobile applications. The database is also designed to accommodate range maps, habitat models and movement data. The project is managed by Habitat Info and makes use of latest spatial data technologies to acquire, manage, analyse and disseminate distribution data. The

project was conceived to address the issue of habitat loss for many species but with the imminent threats facing vultures from poisoning, the purpose and objectives of the ARDB have been brought forward and adapted to enable the ARDB to serve a future role as a monitoring tool. With help from The Peregrine Fund and Birdlife, we made use of ARDB data and comments acquired through a web interface to refine the known distribution range maps for all species of African vultures. These were used to inform IUCN up-listing of the conservation status of these species. Range maps for all African raptors are currently being updated using a similar method. We have also conducted preliminary habitat suitability models for all species for which we hold sufficient data and this includes all vultures except Cinereous. The early results of this exercise will be presented to help highlight the most important areas in Africa for vultures. The first draft models were highly influenced by sample bias. To overcome this we have employed statistical methods and coordinators of the ARDB, through the project "Identification of priority regions and building local capacity for conservation of Critically Endangered African vultures", have been actively driving to fill the location gaps in our knowledge. With new data from surveys the analysis will be revised in January-February 2017 to inform the multi-species action plan for African vultures.

10:45 Vulture 4: Campbell Murn, Graham J. Holloway

Using areas of known occupancy to identify sources of variation in detection probability

Some species are difficult to detect and imperfect detection can lead to inaccurate estimates of occupancy. We used sightings data of White-headed Vultures in areas of known occupancy to calculate detection probability and the factors affecting it. Because occupancy was known we were able to focus on identifying sources of variation in detection probability. Using data from 359 vulture territory visits we assessed nine covariates in 29 candidate models. The highest-supported model indicated that observer speed during a survey, time of year and length of time in a territory influenced detection probability. Average detection probability from this model was 0.207 (SE: 0.033) and the mean number of visits to determine the absence of White-headed Vultures in a potential breeding area is 13 (95 % CI: 9 – 20). Topographical and habitat covariates contributed little to the best models and had little effect on detection probability. The low detection probability of some species means that emphasising habitat covariates could lead to spurious results in occupancy models that fail to incorporate temporal components. Variation in detection probability is complex and influenced by effects at both temporal and spatial scales, but temporal covariates can and should be controlled as part of robust survey designs. Accounting for detection probability in occupancy studies is essential, particularly during presence/absence studies for species that occur at low densities, such as raptors.

DJOU DJ: Farm management practices and birds (Part 1)

10:00 Farm Keynote: Juliet Vickery, Paul Donald, Fiona Sanderson, Mark Hulme, Graeme Buchanan

Integrating agriculture and conservation in African farmland: from theory to practice

How to meeting the growing need for land to produce food and fuel without detrimental impacts on biodiversity is one of the most important challenges in conservation science today. In this 'overview' talk for this symposium, I will review some of the theory, particularly around the concepts of land sparing and land sharing and illustrate the extent to which these approaches do, and do not, work through a range of case studies in African farmed landscapes. These case studies range from smallholder cropping systems and traditional pastoral grazing to large scale plantations, and include staple, commodity and

certified crops. I will conclude with some general lessons that can be drawn from these studies and key areas for future research.

10:30 Farm 2: Hope Usieta, William J. Sutherland

The prospect for food production with minimal biodiversity impact in southern Nigeria

In the current global drive towards ecosystem sustainability and ensuring the world's poor are food secure, identifying strategies that can increase local and global food production at minimal cost to the environment and biodiversity is paramount. Here I combine bird data from woodland and farmland with cassava yield in southern Nigeria to quantify changes in bird population size in relation to increasing yield by fitting density-yield functions for individual bird species. I show that agricultural landscapes support robust populations of woodland-farmland mosaic species, but even these species seemed to decline as yield increased through conventional agricultural intensification. In particular, approximately 59% of species recorded showed higher densities in agricultural landscapes and approximately 37% relied solely on farmland habitat and their densities declined with increasing yield. With agricultural intensification, aimed at increasing yield, as witnessed in Britain and other parts of Europe with its negative impact on farmland bird populations, wildlife friendly farming is likely to be the better strategy to sustain farmland birds recorded in this region, as there is a huge potential to increase yield in these traditional systems while still retaining natural features within the farmed area that support farmland-restricted species.

10:45 Farm 3: Paul K. Ndong'ang'a, John B. M. Njoroge, Phil Atkinson, Mwangi Githiru, Juliet Vickery

Vegetation structure and crop diversity influence on bird composition in Kenyan highland farmlands

The effects of non-crop vegetation and crop diversity on bird species diversity, richness and abundance were examined in the highland farmlands of Nyandarua, Kenya. Bird point counts, vegetation and crop surveys were undertaken during four sampling periods. Linear mixed models were used to examine the effects of vegetation variables on bird species diversity and richness of respective foraging guilds. The effects of crop diversity variables on birds were examined using linear mixed models. Bird species diversity increased with increasing density of woody plant species and vegetation structural heterogeneity. Two gradients of increasing vegetation structural heterogeneity were most important in influencing bird community composition and had positive effects on species diversity and the presence of most of the species assessed: increasing closed woody cover; and increasing fallow and cultivation versus decreasing grassland/pasture cover. Crop diversity had significant positive effects on species richness. Cereal cover had negative effects on species richness, overall abundance and granivore abundance. Occurrence of cultivation/fallow and mixed vegetation as the dominant habitat surrounding crop plots positively influenced granivore abundance. This study reaffirms the need to maintain a structurally rich agricultural landscape for supporting agrobiodiversity.

Tuesday 18th October 2016: 11:30 - 12:45

AMPHITHEATRE SINE SALOUM: Vultures in Africa (Part 2)

11:30 Vulture 5: Ralph Buij

The impact of trade on West African vulture populations

Diurnal raptors have declined significantly in western Africa since the 1960s. To evaluate the impact of traditional medicine and bushmeat trade on vultures and other raptors, we examined carcasses offered at markets at 67 sites (1–80 stands per site) in 12 countries in western Africa during 1990–2013. Black kite *Milvus migrans* and hooded vulture *Necrosyrtes monachus* together accounted for 41% of 2,646 carcasses comprising 52 species. Twenty-seven percent of carcasses were of species categorized as Near Threatened, Vulnerable or Endangered on the IUCN Red List. We used model selection to determine the relative importance of species' characteristics in influencing carcass counts. Common species were traded more frequently than rarer species, as were species with frequent scavenging behaviour (vs non-scavenging), generalist or savannah habitat use (vs forest), and an Afrotropical (vs Palearctic) breeding range. Large Afrotropical vultures were recorded in the highest absolute and relative numbers in Nigeria, whereas carcasses were dominated by palm-nut vulture *Gypohierax angolensis* in Central Africa. Estimates based on data extrapolation indicated that within West Africa 73% of carcasses were traded in Nigeria, 21% in Benin and 5% elsewhere. The trade represents a sizeable proportion of regional populations, suggesting that it is likely to be contributing significantly to vulture declines. Stronger commitment is needed, especially by governments in Nigeria and Benin, to halt the trade in threatened vultures.

11:45 Vulture 6: Justus P. Deikumah

Population status, threats and attitudes towards old world vultures in Ghana, West Africa

Severe declines in the population of many vulture species has been reported globally. Even though vultures provide key ecosystem services, they continue to suffer massive population declines driven by anthropogenic activities including persecution. However, little is known of the current status of West African vultures. The Ghana situation is worse, as information on vultures remains scanty. This paper presents the first ever comprehensive systematic study on the population, decline trends and country specific threats facing vultures and the perception and attitude of people towards them including factors that influence the behaviours of people to support or oppose the conservation of vultures in Ghana. Vultures and other opportunistic birds of prey were surveyed at slaughterhouses, landfill sites, roost sites and communities in >100 survey locations including 1 National Park. Surveys were complemented with road counts. Interviews were conducted in 46 communities with 10 respondents each selected at random with total sample size of 460 respondents. The study recorded 2153 individual hooded vultures, 20 white-backed vultures and 7 palm-nut vultures. More vultures were encountered at slaughterhouses. Overall 63 breeding pairs of hooded vultures were countered and interestingly all nests were found on matured silk cotton trees (*Ceiba pentandra*). It was found that refuse dumps and final waste destinations surprisingly had unusually very low representation of vultures. The study revealed that threats such as hunting for traditional medicine; burning of old lorry tyres as a substitute for firewood to singe meat at slaughterhouses; loss of preferred trees particularly *Ceiba pentandra* as major roost and nesting site had significant but negative influence on the presence of hooded vultures. Respondents (78%) revealed that Furadan 4F concoction used to hunt bush meat such as grasscutter where hunters remove and dispose offal from poisoned animals without burying them may present an indirect novel poisoning pathway in Ghana. This study indicates that vultures later consume such poisoned animal remains suggesting that vulture poisoning indeed is ongoing in Ghana. Majority of respondents confirmed the results of the field surveys and thought that vultures were important and need to be protected but suggested that poisoning, habitat loss particularly loss of *Ceiba pentandra* tree and trade in vulture parts for traditional medicine may pose major threats to vultures in Ghana. Vulture population in

Ghana may therefore be at a higher risk than estimated and near total population collapse if stringent conservation measures are not put in place. It is recommended that government enacts laws to ensure a countrywide ban on the use of lorry tyres at slaughterhouses, a complete ban on the use and sale of Furadan 4F poisons and its use for bushmeat hunting as well as take steps to discourage people from trading in vulture parts. While extensive public education is urgently needed to promote positive attitude towards the environment, vulture conservation programmes and protect breeding sites, up listing the conservation status by the IUCN of the preferred tree, *Ceiba pentandra* will ensure the survival of vulture populations in Ghana.

- 12:00 Vulture 7: Mohamed Henriques, José Pedro Granadeiro, Miguel Lecoq, Hamilton Monteiro, Aissa Regalla, Paulo Catry

Vultures and other avian scavengers in Guinea-Bissau: first baseline data and insights on conservation status

Raptors are strongly affected by disturbances in ecosystems and have suffered dramatic declines throughout Africa. However, even though most vulture species are considered Critically Endangered, for many African countries little is known on their population status, trends and threats. We established the first baseline data in Guinea-Bissau on distribution and abundance of 5 species of vultures and 2 other avian scavengers using road and beach surveys. We also experimented alternative methods to estimate the population of hooded vultures in towns. Current threats were assessed through interviews. Results indicate that Yellow-billed kites are not abundant but widespread. Pied crows are super-abundant in Bissau. Hooded vultures are still abundant, with cities holding largest concentrations (several hundred in most towns, thousands in Bissau). White-backed vultures are still widespread and numerous, especially in the Northwest. Ruppell's and White-headed vultures are very rare. Palm-nut vultures are common, especially in the Bijagós archipelago. Overall abundance decreases as we approach the Eastern part of the country. Unintentional poisoning appears to be the main threat for these scavengers, while persecution for food and for parts for witchcraft seems to occur in relatively small scale. More research is needed in order to clarify threats and identify effective conservation strategies.

- 12:15 Vulture 8: Wim C. Mullié, Bram Piot, Pierre A. Reynaud, Jean-Marc Thiollay
Exponential decrease of an urban Hooded vulture population in Dakar, Senegal, over 50 years

As in many West African cities, in Dakar Hooded Vultures *Necrosyrtes monachus* (HV) have always been characteristic urban scavengers. Of particular interest is the super-abundance of another scavenger, the Yellow-billed Kite *Milvus parasitus*, which population largely outnumbers that of HV. The recent decline of HV in other parts of Africa, mainly Eastern Africa, has been the reason in 2015 for uplisting its status by IUCN in the Red List of endangered species to "*Critically endangered*". As the HV is still common in the Lower Casamance, Senegal, in the Western Region of The Gambia and in Guinea-Bissau, without clear signs of a (recent) decrease, a survey of its current status in Dakar was undertaken and confronted with historical data over the past 50 years, roughly three generations. An exponential decrease of c. 95% was noticed while numbers of Yellow-billed Kites remained high. This decline is on the high end of the decline noticed over much of its range but in striking contrast with the apparently stable population along the West-African coast more to the south (Casamance to Guinea Bissau). Possible causes of the decline are discussed.

- 12:30 Vulture 9: Stephen M. Awoyemi
Vulture declines in West Africa: investigating the scale and (socioeconomic) drivers of the trade in vulture parts for traditional medicine

Vulture parts are traded for use in traditional medicine in West and southern Africa. The trade in vulture parts for traditional medicine in West Africa has been suggested as a possible cause of decline of vultures in the region. A study was carried out in June 2014 to investigate the scale and socioeconomic drivers of the trade in vulture parts for traditional medicine in West Africa with particular emphasis on Nigeria and Sierra Leone. Twenty-six traders in vulture parts in four markets in Oshogbo (11), Abeokuta (10) and Onitsha (5) in Nigeria respectively were interviewed. In Oshogbo there was a total of 34 wildlife traders with only wildlife traders occupying the market. While in Abeokuta there was a total of 87 wildlife traders with the entire traders in the market estimated to be around 200. Fifteen traders in one market in Freetown, Sierra Leone were also interviewed. Information on the proportion of traders in Onitsha and Freetown is unavailable. Ninety-six percent of respondents in all three cities in Nigeria were from the Yoruba ethnic group and 100% of these Yorubas were Muslims. The price of a whole vulture in Oshogbo and Abeokuta ranged from 8,500–9,000 Naira (~US \$65). In Freetown, Sierra Leone, the traders were 67% Muslims and there was no particular pattern of ethnic groups within the 10 ethnic groups identified. Overall, results of the study suggest that demand for vultures is strong in the southwest of Nigeria with a vibrant market. The results also show the problem of trade in vulture parts has a cultural and theological dimension. In Sierra Leone, demand for vulture parts is relatively low. It is recommended that conservation scientists work with religious and cultural institutions to influence behavioural change towards trade in vulture parts in Nigeria. Further studies would need to map areas with trade in vulture parts for traditional medicine to see if they tally with areas where vultures are in decline. This would enable scientists to confirm with greater certainty that trade in vulture parts for traditional medicine is the cause of declines of vultures in the regions where vultures are declining compared to areas where they are relatively abundant.

DJOUDJ: Farm management practices and birds (Part 2)

11:30 Farm 4: Murna Tela, Will Cresswell, Filibus Dami

The impact of plantation crop production systems on bird species diversity on a Nigerian Farm

Increasing human populations in Africa are resulting in increased intensification in agriculture, yet few studies in West African countries, have looked at the effects of intensive agricultural practices on bird populations. We surveyed three different habitat types (plantations, fallow land and woodland) and how five different plantation types (cassava, oil palm, citrus, cashew and mango) might result in the different levels of retained biodiversity on a single large farm in Southern-Nigeria. We recorded 5,403 birds consisting of 138 species from 49 families. Linear modeling revealed a highly significant difference in species richness and diversity across the habitat types with the woodland holding high species richness and diversity, with diversity increasing most significantly with increasing number of trees. Post-hoc tests showed that all pair wise differences for species diversity and richness were significant except between plantation and fallow land. Across plantation types, species diversity and richness were significantly different with mango plantations having the highest diversity and richness. Non-metric multidimensional scaling however showed a high degree of species overlap across all the seven habitat types considered. The differences in diversity and richness may be attributed to the complexity of vegetation composition that provides resources needed for support of high bird diversity.

11:45 Farm 5: Dominic Kimani, Muchane, Muchai, Johnstone Kimanzi, Peter Njoroge, Bernhard Walter, Schroeder Werner, Wolfgang Beisenherz, Paul Matiku

Movements of Sharpe's Longclaw in montane grasslands: Implication for conservation.

Sharpe's Longclaw (SLC) is an endangered bird that is threatened by rapid reduction in the extent and quality of its habitat. It has a very small and highly fragmented range within the agricultural landscapes. The study was conducted in Timau montane grasslands and Mt. Kenya moorland. Using radio telemetry, Flush and count method and Geographic information techniques we investigated the horizontal and altitudinal movement of SLC, compared the population abundances and home range sizes along altitudinal gradient, slopes and aspect. Results showed that SLC were mainly sedentary and did not move across different habitat mosaic. The SLC preferred flat terrains than hilly areas. There was no effect of aspect. SLC exhibited a partial altitude movement. Home range sizes ranged from 3-5 ha. The population density was significantly higher in medium grasslands than in tall grassland ($p < 0.05$). We provided recommendations of effective conservation strategies for the SLC in protected area networks and large private lands.

12:00 Farm 6: Philista Malaki, O. Norfolk, M. Jung, P.J. Platts, P. Malaki, D. Odeny, R. Marchant

Birds in the matrix: the role of agriculture in avian conservation in Taita Hills, Kenya

Agricultural conversion of tropical forests is a major driver of biodiversity loss. Slowing rates of deforestation is a conservation priority, but it is also useful to consider how species diversity is retained across the agricultural mosaic. Here, we used point counts to survey birds along a land-use gradient in Taita Hills, Kenya and show that the agricultural mosaic supports an abundant and diverse bird community with high levels of species turnover. Agroforests form a particularly valuable component of this landscape mosaic, supporting almost twice the estimated number of species as primary forest, although plot-level diversity was similar. Forest specialists were confined predominantly to primary forest, with secondary vegetation, agroforest and cropland dominated by forest visitors. With the exception of forest generalists, bird abundance and diversity were lowest in timber plantations. Ordination analyses showed that representation of forest specialists decreased with increasing distance from primary forest. Feeding guilds occurred at similar abundance in all land-use types. Continued protection of primary forest is essential for conserving forest specialists, including two Critically Endangered local endemics (*Apalis fuscicularis* and *Turdus helleri*), but the heterogeneous mosaic also make an important contribution towards maintaining bird diversity in the Taita Hills, whilst providing for local people.

12:15 Farm 7 Muchane Muchai, George Amutete, Geoffrey Wambugu, Charles Mugoya
Land use practices and their implications on avifauna in Maasai Mara Ecosystem

The composition, abundance, diversity and species richness of birds were assessed in natural grassland and woodland inside and outside protected area and adjacent agricultural farms in Maasai Mara savannah ecosystem (MME). Sampling of birds was carried out in November, 2009 (short rain), April 2010 (wet rainy season) and September 2010 (dry season) using time species counts and distance line transects. A total of 151 bird species were recorded. Bird density and diversity was highest in grassland, intermediate in woodland and lowest in agricultural land. Plots outside protected areas recorded higher densities of birds compared to those inside. Human related disturbances outside protected area network declined density in grassland and woodland in wet region but increased the bird density in dry region. There were significant interaction between Season*Region*Land use, Region*Land use and Region*Protection*Land use ($p < 0.05$ in all cases). Linear regression analysis revealed a strong linear relationship on bird species richness and abundance with vegetation variables ($P < 0.05$). Redundancy analysis and principal component analysis linked and separated various avifaunal variations with land use systems.

The study highlights the important effect of agriculture on bird assemblages and supports conservation alternatives beyond protected area network.

12:15 Nectivores Anina Coetzee, Anton Pauw, Phoebe Barnard

Urban nectarivorous bird communities in Cape Town, RSA, are structured by resource distribution

Land-use change, such as urbanisation, cause habitat fragmentation, but also create novel habitats for birds. Both species and habitat traits can be used to predict the effects on bird communities. Nectarivorous birds worldwide show varying tolerances to urban areas, but studies from Africa are lacking. We investigated nectarivorous bird communities in a medium-sized South African city and asked which biological and garden traits best predict the community assembly of nectar specialist and generalist birds. Information was collected on garden traits and the abundance of 9 nectarivorous bird species for 191 gardens by means of a questionnaire. Habitat generalization and longevity were identified as the most important biological traits influencing bird occurrence in urban areas. Generalist birds' urban adjustment was facilitated by large vegetated areas in gardens and the presence of bird baths, while nectar specialist species were facilitated by sugar water feeders and indigenous plant abundances. Abundances of all nectarivorous bird species, but not their richness, were negatively related to the distance to nearest natural habitat. In conclusion, nectar generalist species dominated South African urban nectarivorous bird communities. Though some biological traits and dispersal barriers seem to limit urban adaptation by nectar specialists, nectar resource availability could facilitate this adaptation.

Tuesday 18th October 2016: 14:30 - 15:15

AMPHITHEATRE SINE SALOUM: Advances in the ecology of parrots in Africa (Part 1)

14:30 Parrots Keynote: Rowan Martin

The wild bird trade and African parrots: past, present and future challenges

Over a third of bird species are involved in international trade, with trapping for the pet trade affecting 10% of threatened birds globally. Several African parrots are among those traded in the highest volumes and trapping for the pet trade is the most commonly cited threat to Africa's parrots. We consider patterns in trade in international trade of African parrots and its impact on wild populations, focusing particular attention on Grey parrots, one of the most widespread parrot species in Africa and one of the birds traded in the highest volumes under CITES. Recently documented collapses in wild populations of Grey parrots have prompted calls for a change in the framework regulating international trade in this species. We present data on the socio-economic dimensions of trade from a case-study at an emerging frontier in the trapping of Grey parrots in central Democratic Republic of Congo. Using multiple investigative approaches, including interviews with trappers and traders, direct observation of transactions and observation of shipments in transport hubs, we establish the structure of the commodity chain and identify key dynamics in the harvesting of the species. We consider this case study in the context of the parrot trade and discuss research needs for the development of evidence-based policy interventions to address the threat of the wild-bird trade to Africa's parrots.

15:00 Parrots 1: Quintino Tchanchalam, Aissa Regalla, Castro Barbosa, Mohamed Henriques, Rowan Martin, Daniel da Costa Lopes, Hamilton Monteiro, Paulo Catry

Ecology and conservation of Timneh parrots *Psittacus timneh* in Guinea-Bissau

Timneh parrots are classified as Vulnerable by the IUCN, on the basis of population declines driven by trapping for the pet trade and habitat loss. Little is known on the status of populations or the current threats they face. We conducted surveys in Guinea-Bissau during 2014 and 2015, confirming their presence on 25 coastal islands. Distance-sampling transects indicated that overall densities were low (0.59 ± 1.98 parrots/km²) but varied considerably. Two islands with no permanent human population had particularly high densities with several flocks of 20-40 individuals observed. Interviews with local residents suggest that Timneh parrots in the country have suffered a large historical decline, but populations in some areas may have stabilized recently. Research into their breeding biology was conducted in collaboration with former parrot trappers. Surveys of cavities used for nesting indicated a strong preference for large mature trees, highlighting the importance of habitat protection. Monitoring of nests revealed nestlings were poached from at least two nests during 2014 and 2015. Assessments of diet based on direct observations of feeding behaviour and interviews identified at least 38 plant species are consumed (mostly kernels of fruits, also pulp, seeds and flowers). Ongoing conservation initiatives involve the engagement of former parrot trappers in monitoring and surveillance activities, the installation of nest-boxes, and awareness raising amongst local communities.

DJOUDJ: Vultures in Africa (Part 3)

14:30 Vulture 10: Clément Dabone

Le Vautour charognard *Necrosyrtes monachus*, une espèce en danger critique d'extinction: Etat de la population et causes du déclin (BURKINA FASO)

Malgré la double protection de la part des populations locales et de la législation du pays, les populations de Vautours charognards n'ont pas cessé de diminuer au Burkina Faso depuis les années 1970. La présente étude a pour but d'établir un état actualisé des populations de vautours charognards et de déterminer les différentes menaces pour cette espèce au Burkina Faso. Un dénombrement dans les principales villes et communes rurales du pays, une étude de la phénologie et de l'éthologie de la reproduction, un examen de l'impact des activités de l'homme sur le succès de la reproduction et en fin une enquête sur l'ethnozoologie, sur l'utilisation de l'espèce dans la médecine traditionnelle et sur les cas de tuerie massif des Vautours charognards ont été les activités menées au compte de cette étude. A l'issue des deux sessions de dénombrement 2933 Vautours charognards en moyenne ont été inventoriés dans 31 villes 13 communes rurales. A l'issue de l'étude de l'éthologie et de la phénologie de la reproduction aucun changement significatif au point d'entraver le succès de la reproduction n'a été trouvé. Cependant aux regards de la productivité faible, et l'exigence de l'espèce dans choix du site de nidification et aussi dans le choix de l'espèce d'arbre abritant le nid, sa reproduction n'est plus que jamais menacée dans ce contexte d'urbanisation à grande échelle avec des taux de déboisement inquiétants. Les activités humaines qui ont de façon significative une influence négative sur le succès de la reproduction sont la récolte illicite des matériaux de construction du nid, des œufs, des jeunes mais aussi la destruction de l'habitat au voisinage du nid par la mutilation de l'arbre l'abritant. De ces enquêtes réalisées, il ressort une vulnérabilité de l'espèce du fait de sa quasi-totale dépendance des ressources alimentaires anthropiques devenant de plus en plus rares. Aussi l'utilisation de l'espèce dans la médecine traditionnelle et la sorcellerie est d'une

importance remarquable au Burkina Faso. En effet de 2011 à 2016 au moins 24 incidents d'empoisonnements massifs tuant 726 Vautours charognards ont été observés dans 14 localités du Burkina Faso. 70% de ces Vautours charognards ont été empoisonnés intentionnellement et étaient majoritairement destinés à la vente sur le marché local mais surtout à des acheteurs des pays voisins en témoigne la fréquence de ces tueries massives dans les localités frontalières.

14:45 Vulture 11: Evan R. Buechley

An overview of the current status, distributions and ecology of endangered vulture populations in Ethiopia

We present a summary of the current status, distributions, and foraging ecology for populations of seven vulture species in Ethiopia. To update species distributions, we reviewed published literature and birding trip-report sightings, and combined this with road-counts (we surveyed optimal roads that spanned Ethiopia's geographic, climatological, and elevational diversity) and point-counts (at abattoirs—traditional slaughterhouses where animal remains are disposed of on site— that host the largest congregations of vultures in the country). Between 2013 and 2016, we completed over 5,000 km of road surveys and surveyed 31 abattoirs around the country. We contrast recent vulture sighting records (post-2000) to historical observations (pre-2000), to estimate long-term distribution changes, using logistic regression to model presence probability as a function of latitude, longitude, and year. Additionally, six abattoirs in the greater Addis Ababa metropolitan area were visually censused monthly (from September 2015 to present). Camera traps were also installed at four abattoirs in 2014 (and continuously operational until present), capturing photos once per hour at offal piles where scavengers congregate to feed. Using these visual and photographic surveys, we summarize the relative abundance of scavengers, peak feeding times for species, seasonal fluctuations in species composition, and evidence for competition between vultures and feral dogs for carrion resources. Finally, we report on the satellite tracking of 16 Egyptian Vultures (EV) *Neophron percnopterus* in the Horn of Africa. Using this tracking data, we have constructed a resource selection function (RSF) that provides an overview of the habitat selection of EV on regional and local scales. Regionally, EV select for low elevations and desert and grassland habitats, while, locally, EV demonstrate strong selection for proximity to human settlements, indicating reliance on human food subsidy. We use the RSF, combined with kernel density estimates of home ranges, to highlight critical habitat for EV, including feeding sites and important movement corridors.

15:00 Vulture 12: Corinne Kendall, Claire Bracebridge, Msafiri Mgumba

Saving southern Tanzania's critically endangered vultures

Following recommendations from the first Pan-African Vulture Summit, North Carolina Zoo and the Wildlife Conservation Society in partnership with Tanzanian National Parks began conducting roadside counts of vultures in Ruaha and Katavi National Park in southern Tanzania. These surveys suggest that southern Tanzania may represent a stronghold for vultures and that threats are minimal, but merits further study. Research over the last three years has focused on population monitoring and ranger training. Recently we have begun a study using satellite telemetry to look at the habitat use and range of White-backed vultures in the region and also begun testing vultures for lead. In this talk, I'll present findings from our work to date, including population trends, ranging patterns, and initial threat assessment for this region.

Tuesday 18th October 2016: 15:45 - 17:15

AMPHITHEATRE SINE SALOUM: Advances in the ecology of parrots in Africa (Part 2)

15:45 Parrots 4: Deborah Fogell, James Sells, Alison M. Mckeand, Rowan O. Martin, Becki Lawson, Cao Tien Trung, Nancy Bunbury, Vikash Tatayah, Jim J. Groombridge

Beak and feather disease virus in wild parrots from West Africa and the Indian Ocean islands

Psittacine beak and feather disease (PBFD), caused by the Beak and feather disease virus (BFDV), originated in the South Pacific in the 1970s before spreading rapidly across the world due to the trade in companion birds. However, despite high parrot endemism, little is known about the presence of BFDV in wild populations within Africa, Asia and South America. The aim of this study was to provide a much needed first step in assessing data deficient regions for a better understanding of where BFDV is present in wild populations. Here we present the first published report of BFDV in wild *Psittacula krameri* within its African and Asian native ranges and *Psittacus timneh* in West Africa. It is also the first record of BFDV in wild non-native *Psittacula krameri* in the Seychelles whilst, conversely, no BFDV was detected in the last remaining population of *Coracopsis barkleyi* in the Seychelles or in non-native populations of *Psittacula krameri* in South Africa. As previously published in Kundu et al. (2012), BFDV was detected in both the native and non-native parakeet species in Mauritius. Time calibrated phylogenies suggest multiple incursions of BFDV in West Africa from European, Southern African and Southern Asian origins. However, only single introductions of BFDV appear to have occurred on the Seychelles and Mauritius. Ongoing transport of infectious disease around the world due to global pet trade risks introducing novel BFDV isolates into wild populations of vulnerable species.

16:00 Parrots 4: Sandi Willows-Munro, Willem G. Coetzer, Colleen T. Downs, Mike R. Perrin
Molecular systematics of the Cape Parrot (*Poicephalus robustus*)

The taxonomic position of the Cape Parrot (*Poicephalus robustus robustus*) has been the focus of much debate. Previous morphological, ecological, and behavioural assessments suggest that the Cape Parrot should be viewed as a distinct species separate from the other two *P. robustus* subspecies (*P. r. fuscicollis* and *P. r. suahelicus*). In this study we investigated the validity of these recommendations using multilocus DNA analyses. We genotyped 138 specimens from five *Poicephalus* species (*P. cryptoxanthus*, *P. gulielmi*, *P. meyeri*, *P. robustus*, and *P. rueppellii*) using 11 microsatellite loci. Additionally, two mitochondrial (cytochrome oxidase I gene and 16S ribosomal RNA) and one nuclear intron (intron 7 of the β -fibrinogen gene) markers were sequenced. Bayesian clustering analysis and pairwise F_{ST} analysis of microsatellite data identified *P. r. robustus* as genetically distinct from the other *P. robustus* subspecies. Phylogenetic and molecular clock analyses of sequence data also supported the microsatellite analyses, placing *P. r. robustus* in a distinct clade separate from the other *P. robustus* subspecies. Molecular clock analysis places the most recent common ancestor of *P. r. robustus* and *P. r. fuscicollis* / *P. r. suahelicus* at 2.13 to 2.67 million years ago. Our results all support previous recommendations to elevate the Cape Parrot to species level.

16:15 Parrots 5: Colleen Downs

Cape Parrot distribution and numbers: importance of citizen scientists

The Cape Parrot, *Poicephalus robustus*, is endemic to South Africa and numbers have reportedly declined since the early 1900's. It is a forest specialist and food nomadic, moving between patches depending on fruit availability. This makes it difficult to estimate numbers accurately and to determine its distribution. The annual Cape Parrot Big Birding Day (CPBBD) was initiated in 1998 as a national census to determine a population estimate. Volunteers assist in monitoring and counting the Cape Parrot in the Eastern Cape, KwaZulu-Natal and Limpopo at indigenous forests as well as sites where the parrots are known to feed outside of forests. Here, a summary of 15 years of census data is presented. In all years, with the exception of 2009, less than 1500 Cape Parrots were recorded in the wild. The census data showed a slight increase in Cape Parrots although this may be largely explained by an increase in coverage of suitable habitat and stabilisation in the population since 2005. A current distribution map for the Cape Parrot based on census data is presented. The distribution remains largely unchanged from that presented in the 1970's. This study highlights the value of public participation in monitoring an Endangered species and the need to conserve the forests where these parrots occur, due to their nomadic feeding behaviour.

16:30 Parrots 7: Helen Claire Gath, Ken Norris, Malcolm Nicoll, Ben Collen

An appetite for success: supplementary feeding improves the breeding output of Echo Parakeets

A well-established approach for supporting small populations is the provision of supplementary food, particularly in bird conservation. Positive responses are predominantly reported, yet considerably few studies detail the effects across multiple breeding stages, or even multiple seasons. Here I evaluate the impact of food provisioning, through fixed feeding stations, on the reproductive success of the once Critically Endangered Echo parakeet (*Psittacula eques*), a recovering species endemic to Mauritius. Detailed breeding records spanning a remarkable 13 years, provided 682 clutches from 151 females, for evaluation alongside supplementary food availability. We found distance between nest sites and feeding stations strongly predicted feeder use, dropping from a 99% probability of use to 14%, when nests were >2km from a station. Pairs using supplementary feed fledged significantly more chicks (0.7) per clutch than those not using supplementary feed. This increased output results from higher hatch numbers and increased chick survival, differences which could ultimately influence future population trends. Understanding the role of supplementary food in the Echo population has been limited until now. Results here confirm its measurable benefits on reproductive success, and illustrate the spatial influence of this conservation tool across the parakeet's range, thus providing a valuable framework for future management decisions.

DJOUDJ: Vultures in Africa (Part 4)

15:45 Vulture 13: Micheal Kibuule, Derek Pomeroy

Population status of Hooded Vulture outside protected areas in Uganda

The Hooded Vulture *Necrosyrtes monachus* is a critically endangered endemic bird of sub-Saharan Africa. Its population has reduced by over 70% over the last three decades. Uganda's protected area network holds just 20-150 Hooded Vultures with an encounter rate of 0.5 birds 100km⁻¹. We present a review of the current population knowledge of the Hooded Vulture in Uganda, along with preliminary results of an on-going intensive study, which aims at estimating its population in the 15 largest towns, threat identification and develops a standard method for future monitoring. We collect data by direct counting at both feed and roost sites. Face to face interviews with people around abattoirs and dumpsites help

ascertain existing threats. There are about 300 individuals in the fifteen largest towns. However, about 55 % were recorded from the capital (Kampala) whose estimated human population is about 2m. Very few vultures were recorded from Eastern and Northern towns (0.1%). Roost counts results in higher numbers than feeding sites; However number of roosting birds tend to reduce linearly with increase in distance from feeding sites. Other than distance, external light intensity negatively affects roosting birds. Breeding information is insufficient; four nests at an earlier stage are being monitored regularly. Demand of the species for traditional medicine is the most frequent threat, other threats include; competition for food with humans and other animals, poisoning, stoning, electrocution, road accidents and persecution for food.

16:00 Vulture 14: Tim Wachter, Thomas Rabeil, A. Harouna, J. Newby

Vulture observations in the Sahelo-Saharan zone of Chad and Niger

We present a summary of all vulture encounters during a series of wildlife surveys conducted in eastern Niger and central Chad, between 2010 and early 2016. These surveys were not restricted to roads and not designed primarily for raptor surveys, so comparison with earlier estimates is limited, but overall vulture encounter rates (birds/100 km) were broadly similar to those reported in the western Sahel in 2004. Rüppell's Vulture *Gyps rueppelli* was the most frequently observed species and examples of tree nesting by this species and Lappet-faced Vulture *Torgos tracheliotos* in widely separated parts of the Sahel and the Sahara are summarized. The first records of breeding Egyptian Vulture are confirmed in the Koutous massif (Niger) and the importance of Sahelo-Saharan protected areas for breeding populations of these species is documented based on recent vulture observation rates. The results of an awareness campaign carried out in Niger to emphasize the strong exposure of vultures to human influence and their contribution to ecosystem services are also discussed.

16:15 Vulture 15: Sonja C. Krüger

An Investigation into the Decline of the Bearded Vulture *Gypaetus barbatus* in Southern Africa

This paper synthesises 15 years of research into the conservation of the Critically Endangered Bearded Vulture. Extensive surveys determined declines in territory occupancy, distribution and density over the past five decades with the current population estimated at 368-408 individuals. Three hypotheses were examined to explain which covariates were associated with territories recorded as abandoned during the surveys. The strongest support was for the human impact hypothesis, with abandonment more likely in territories with higher densities of power lines and human settlements. The movements of four age classes were investigated using data from satellite transmitters. Average adult home ranges (286 km²) were < 1% the size of the average foraging ranges of non-adults (10 540 –25 985 km²). Non-adults increased the size of their range as they aged, with older birds facing the greatest exposure to risk factors. Population viability analysis models predicted a negative growth rate for the population over the next 50 years with a high probability (0.89) of extinction, being due to low survival rates and low productivity. Several recommendations are made to achieve a positive growth rate and continued monitoring of the population is essential to evaluate the success of the implementation of these recommendations.

16:30 Vulture 16: Glyn Maude, Beckie Garbett

A multi-disciplinary approach to vulture conservation in Botswana

African vulture populations are declining rapidly and are said to be heading towards extinction. Based on this, in 2013 we established Raptors Botswana and began research focussing on vultures in Botswana. We are using a multi-disciplinary approach to achieve our

goals of learning more about their ecology and behaviour and attempting to reduce the alarming rate of vulture decline in Botswana and the surrounding regions. We are tracking the movement of five species of vulture using satellite/GPS transmitters. We are also studying the breeding/nesting behaviours of lappet-faced vultures in particular; but are also conducting surveys to identify nesting locations of other vulture species. A widespread raptor road count across northern Botswana has been conducted using the same methods and driving the same routes as was done by Herremans in the 1990's. We have studied the blood levels of vultures and further work on blood lead levels of vultures will be published in 2017. Beckie's PhD encompasses a lot of this research and will ensure dissemination of our results to numerous forums. Our conservation education program has an increasingly significant focus on vulture conservation. We work with several communities in Northern Botswana and have a number of initiates aimed at ultimately helping the conservation of vultures. With the increasing numbers of mass vulture poisoning events in Botswana we aim to expand our efforts as the vulture crisis escalates.

16:45 Vulture 17: W.L. Phipps, Maria Diekmann, L.M. MacTavish, J.M. Mendelsohn, Vinny Naidoo, Kerri Wolter, R.W. Yarnell

Due South: A first assessment of the potential impacts of climate change on Cape vulture occurrence

African vulture populations are declining across the continent due to multiple anthropogenic threats. The Cape vulture (*Gyps coprotheres*) has declined throughout its range and is now listed as being extinct as a breeding species in Namibia. In addition to known mortality factors (e.g. poisoning) it has been suggested that climate change might have contributed to the demise of Cape vultures in northern Namibia and other northern colonies. To provide a first assessment of the potential impacts of climate change on the occurrence of Cape vultures a presence-only ecological niche modelling method (Maxent) was used to predict the spatial occurrence patterns of wild-caught vultures fitted with GPS tracking units in northern Namibia and northern South Africa under current and future climatic conditions. The models showed high predictive power and precipitation seasonality and other bioclimatic variables were identified as the most important variables for predicting Cape vulture presence. Although an increase in the area predicted to be suitable for Cape vultures was predicted under future climate conditions, a pole-ward shift in the mean centre of the range of 151-333 km was predicted with significant range loss from the former breeding range in north-central Namibia and the core breeding range in northern South Africa. This study provides the first indication that Cape vulture occurrence patterns will potentially be affected by the changing climate in southern Africa.

17:00 Vulture 18: Maggie Hirschauer
There's no place like home: causes and consequences of reduced ranging in captive bred Cape Vultures

Ten captive bred, parent raised Cape Vultures (*Gyps coprotheres*) of various ages were released in the Magaliesberg Mountains, South Africa to initiate a supplementation programme. This study aimed to monitor their behaviour, physical condition and dispersal post-release in relation to their age. After eight months, none of the birds had moved more than 8 km from the release site, nor had they foraged away from the vulture restaurant on site. Although altitude records of > 3100 m were recorded, their flight skills seemed inadequate. Wild and captive bred birds were observed at carcasses to compare competitive and feeding behaviours. Older birds, both wild and captive, fed the most efficiently. Preliminary evidence suggests females are more dominant and have higher display rates than males. Captive bred juvenile and four year old birds' competitive and feeding behaviours were the closest to, but still generally below, average values for same-aged wild

birds. Recommendations for management include the establishment of an acclimatization enclosure removed from the breeding site and a varied or reduced post-release feeding schedule. Fledglings should be relocated and housed at the acclimatization enclosure until they are four years old.

Thursday 20th October 2016: 09:45 - 10:30

AMPHITHEATRE SINE SALOUM: Non-breeding ecology of Afro-Palearctic migrants in Africa (Part 1)

09:45 Migrants Keynote: Will Cresswell

Non-breeding ecology of Afro-Palearctic migrants in Africa

The ecology of Palearctic birds during their wintering period in Africa has only recently moved from anecdote and site records to being systematically studied. Nevertheless the amount of information available for most species is still very limited to address the key questions that will inform any efforts to conserve this rapidly declining group of species. Here I review all of the literature available that has explicitly arisen from field studies of Palearctic migrants in Africa (excluding waterbirds). I show which species have been studied and the distribution of research between seven main questions: fuelling and stopovers; competition and specialisation; habitat use; phenology; site fidelity and ranging; foraging and diet; life history questions. I review the overall availability of studies and any trend or patterns in research, including the citation of the African field studies in the wider general literature. For example, for Common whitethroats, there are 25 published studies which have been cited 233 times: most studies are of habitat use (40%) or refuelling (16%), although all subject areas are equally cited (c. 10 per paper) except for competition and life history, which are rarely cited. The talk will therefore introduce the broader context of the specific species or question related talks later in the symposium as well as carrying out a gap analysis to identify priorities for future research.

10:15 Migrants 2: Sam T. Iwande

Wintering Palearctic migrants – how specialised are their habitat requirements?

How specific an animal's habitat requirements are will determine its ability to deal with anthropogenic climate and habitat change. Migratory birds are observed as being particularly vulnerable to such change, but theory predicts that they should be largely generalist. This prediction was tested with the aim to confirm whether migratory Palearctic birds wintering in the savannah biome of Africa were relatively generalist compared to taxonomically and ecologically similar Afrotropical resident species in terms of habitat use. The degree of specialization of these species groups to certain habitat characteristics was assessed and compared by calculating the relative occupancy of the species along habitat gradients, where wide occurrence would indicate generalism and narrow occurrence implies specialism. Palearctic migrants as a group could not be clearly distinguished as generalists relative to Afrotropical residents with respect to habitat attributes. The only indication of greater flexibility in Palearctic migrants was a significant tendency to utilize habitats over a larger latitudinal range. The results probably confirm that migrants are generalists but not particularly more so than taxonomically similar resident species that also occur over a wide range of habitat types within the savannah biome.

DJOUDJ: Managing impacts on seabirds from forage fisheries, bycatch and the depletion of stocks (Part 1)

09:45 Seabirds keynote: Ross M Wanless, Bill Sydeman

Why seabirds are, or should be, a fisherman's best friend

For millennia, fishermen have used seabirds as highly visible and reliable sources of information for where to fish. However, the move from artisanal to industrial fishing has created a separation between seabirds and fishers, and the advent of fish-finding technologies has, in many fisheries, cemented that separation as a permanent divorce. Extending the metaphor, in some cases that divorce has been acrimonious: conservationists and fisheries managers pit seabirds against fishing, casting competition between seabirds and fisheries as a win-lose battle; save seabirds or preserve quotas. This view is profoundly problematic. Seabirds remain indicators of fish availability and, unlike fish, are simple and relatively inexpensive to monitor. Moreover there is compelling evidence that seabirds are good indicators of ecosystem health. Using African Penguin-fishery conflicts in South Africa, I highlight the pitfalls of adversarial stances and propose more pragmatic, win-win solutions. This kind of approach will not lead to more sustainable fishing per se. Furthermore, difficult or costly compromises may still be required to prevent overfishing or collapse. But if a locally relevant 'seabird index' is adopted, fisheries managers will have an affordable and reliable early warning system for ecosystem and stock health. This will transform seabirds from a contentious threat to quotas into a non-consumptive resource, incentivising fisheries to protect seabirds.

10:15 Seabirds 1: David Grémillet, Clara Péron, Tangi Le Bot, Pascal Provost, Justine Dossa, Amélie Lescroël

West African fisheries and European migratory seabirds

Foreign fisheries massively harvest waters off West Africa, plundering local marine economies and threatening African food security. We warn that these fisheries might also affect juvenile and adult European seabirds during their autumn migration and at their wintering grounds. Using miniaturised GPS, satellite transmitters and geolocators, we tracked the migratory movements of 64 adult and juvenile Northern Gannets (*Morus bassanus*) and Scopoli's Shearwaters (*Calonectris diomedea*) after their breeding season in the eastern North Atlantic and the Mediterranean Sea, respectively. During winter (October to March) birds made extensive use of marine areas within the exclusive economic zones of Morocco, Western Sahara, Mauritania and Senegal. These juvenile and adult European seabirds are therefore dependent upon African marine resources and at risk from competition with fisheries, as well as intentional and incidental mortality in fishing gear. Those threats occur additionally to detrimental seabird–fishery interactions in Europe. There is an urgent need for improved marine conservation off West Africa. Our data demonstrating connectivity between specific European breeding colonies and African wintering areas are a major step towards stakeholder involvement. Seeing the oceans through the eyes of seabirds opens new avenues for conservation.

Thursday 20th October 2016: 11:00 - 12:30

AMPHITHEATRE SINE SALOUM: Non-breeding ecology of Afro-Palearctic migrants in Africa (Part 2)

11:00 Migrants 3: Aissatou Yvette Diallo, Papa Ibnou Ndiaye

Comportement et distribution spatiale des Spatules blanche et africaine dans la ZICO des Niayes

Notre étude a porté sur la sélection des ressources par les Spatules blanches (*Platalea leucorodia leucorodia*) et africaine (*P. alba*) dans la Zone d'Importance pour la Conservation des Oiseaux (ZICO) des Niayes. Les Niayes de Dakar constituent un écosystème particulier de zone humide, elles jouent un rôle déterminant dans la reproduction et la survie de beaucoup d'espèces d'oiseaux migrants et autochtones. L'étude s'est déroulée du 28 mai au 27 août 2012. Nous avons utilisé les méthodes d'observations focale et scan pour le dénombrement des effectifs et pour la détermination du comportement des oiseaux. Les données recueillies sur le terrain ont ensuite été exploitées en utilisant le logiciel statistique libre R (version R i386 3.2.2), qui nous a permis faire les statistiques exploratoires avec des graphes et de les analyser. Ainsi, nous avons pu dénombrer avant l'hivernage le plus grand nombre d'individus, 36 spatules blanches dont 4 individus bagués provenant des Pays Bas et de l'Espagne et 8 spatules africaines. Cependant, une nette diminution est notée après l'apparition des premières pluies et l'effectif s'est vu réduit à une dizaine d'individus en moins de trois semaines. Les résultats sur la distribution spatiale des espèces montrent une préférence pour certains endroits où la profondeur de l'eau était faible et plus propices à l'exploitation des ressources. Ces endroits semblent être aussi des milieux privilégiés pour la nidification d'autres espèces d'oiseaux.

11:15 Migrants 4: John Mallord, Chris Orsman, Roger Skeen, Graeme Buchanan, Danaë Sheehan, Juliet Vickery, Japheth Roberts

Fine and broad-scale selection of disappearing African habitats in a declining long-distance migrant

Afro-Palearctic migrants have suffered some of the steepest population declines of all European species. One such species, the Wood Warbler *Phylloscopus sibilatrix*, spends the northern winter in the humid forest zone of West Africa. Between 2012-14, we studied the species' fine-scale habitat preferences at a site in Eastern Region, Ghana. Here we found strong selection for a particular tree species, *Albizia zygia*, amid well-wooded farmland, a habitat that declined by 26% at this site over the three years of the study. Large-scale surveys for Wood Warblers have been undertaken in a number of countries within the species' West African non-breeding range, including Ghana, Togo, Benin and Cameroon. Based on survey locations from these four countries, and land cover maps, suitable habitat was estimated to be 40-60% forest cover. Utilising maps from 2000 and 2014, it was calculated that there has been a 25% loss of forest in this category since 2000. This suggests that habitat loss could be limiting the populations of this declining long-distance migrant.

11:30 Migrants 5: Ben J. Koks, Almut E. Schlaich, Franck Noel, Wim C. Mullié

Diet composition of wintering Montagu's Harriers in Sahelian West Africa

Many bird species are well studied during the breeding period but much less is known about their wintering ecology. This holds in particular for species breeding in temperate regions and wintering in the tropics. It is of great importance to understand which factors influence birds during winter since they often spent the biggest part of the year outside their breeding areas. Information on prey choice of Palearctic migrants wintering in the Sahel remains scarce and is often limited in space and time. Here, we describe the diet

composition of Montagu's Harriers *Circus pygargus* on a large spatial scale, ranging from Senegal in the West to Niger in the East. More than 2000 regurgitated pellets were collected between 2007 and 2016 on roosts in Niger, Burkina Faso, Mali, and Senegal. The majority of prey remains could be determined to species level. The main part of prey remains consisted of grasshoppers and other insects, in contrast to the breeding period where small mammals and songbirds form the main prey of Montagu's Harriers. We discuss differences in diet composition between roosts, in relation to longitude, landscape, and habitat characteristics of the surrounding feeding areas.

- 11:45 Migrants 6: Almut E. Schlaich, Raymond H.G. Klaassen, Willem Bouten, Vincent Bretagnolle, Ben J. Koks, Alexandre Villers, and Christiaan Both

Ecological determinants of mid-winter movements of Montagu's Harriers

Most long-distance migrants spend more than half of their annual cycle on their wintering grounds. Our interest is if they choose the sequence of various wintering sites, depending on seasonal ecological changes, and whether this carries over to later annual cycle stages. Montagu's Harriers *Circus pygargus* use on average four distinct wintering sites in the Sahel to which they are site-faithful in consecutive years. First wintering sites are located in the northern Sahel, then harriers move progressively southwards following a shifting 'green belt' of vegetation harboring highest grasshopper densities. Using individual GPS-tracks of 36 Montagu's Harriers over six winters, we show that individual harriers moved earlier between consecutive sites in drier years compared to wetter (greener) years. In addition, we discuss possible carry-over effects of ecological conditions during winter, looking at departure date and arrival in the breeding areas.

- 12:00 Migrants 7: Rien van Wijk

The black box in bird migration

The study of bird migration is taking a rapid flight over the last years with the development of newer, more advanced tags. We are able to obtain more data with increasing detail on smaller and smaller bird species each year. Despite these technological advances and an increasing understanding of migration speed, flight behaviour and migration routes, one key aspect of the annual cycle of migrating birds is still lacking fundamental research: their whereabouts and foraging behaviour on the non-breeding grounds. There have been efforts in recent years, but most studies date back to the 70's and 80's of the last century. Still a lot of ground has to be covered, also in respect to inter species interactions with resident African bird species and intra-African migrants. During this talk I aim to give a brief overview of research to date and will define open research questions for the near future.

- 12:15 Migration 8: Jacob Davies, Rob Robinson, Calvin Dytham, Colin Beale

The role of demographic parameters in range change in an Afro-Palearctic migrant

Understanding the mechanisms by which species change their range will help us predict species' response to environmental change. Eurasian reed warbler is an Afro-Palearctic migrant which has recently expanded its range in the UK, but the underlying demographic mechanisms are unknown. Survival in some Afro-Palearctic migrants is influenced by environmental change in the African wintering grounds (e.g. Sahel rainfall), but previous research suggests this is not the case in Eurasian reed warbler. However, environmental change outside of the breeding season can influence other demographic parameters (e.g. through carry-over effects). In our study we aim to establish the individual contribution of all demographic parameters to UK range change in Eurasian reed warbler. Using hierarchical models, we estimate demographic parameters and their variation in space and time from some of the most comprehensive datasets on survival, breeding success, abundance and distribution in the world. We then relate spatio-temporal trends in

demographic parameters to environmental conditions on the wintering grounds in Africa. We show that annual survival (with mortality primarily occurring during migration and in Africa) varies spatially across the expanding range edge. This suggests that carry-over effects from local breeding season conditions may be as or more important than regional impacts on conditions across Africa in controlling population dynamics of some Afro-Palearctic migrants.

DJOUDJ: Managing impacts on seabirds from forage fisheries, bycatch and the depletion of stocks (Part 2)

11:00 Seabirds 2: Ngoné Diop

Feeding ecology of red-billed tropicbirds on two islands in the tropical Atlantic

Basic knowledge on the feeding ecology is still missing for many seabirds, such as red-billed tropic birds (*Phaethon aethereus*) in the tropical Atlantic. We deployed GPS tracking devices on tropicbirds from Madeleine Island, Senegal, and on St Helena during incubation (n=27 and 47, respectively) and early chick rearing (n=11 and 81) stages and collected blood samples and spontaneous regurgitations from both adults and chicks. We analysed diet conventionally and using $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values. We used the “EMbC” R-package to distinguish between foraging, resting and relocation behaviour. Diet of tropicbirds was entirely composed of fish. Birds exploited both pelagic and neritic waters. The trips from the oceanic island (St Helena) were almost twice as long as from the coastal island in West Africa. Foraging decayed with the distance to the breeding colony. $\delta^{13}\text{C}$ values in plasma from tracked birds decreased with increasing coast distance. Low $\delta^{13}\text{C}$ values in the plasma of chick-rearing birds as well as on the blood of their chicks confirmed the more coastal behaviour of adults during this stage. This study provides for the first time insights on the feeding ecology of red-billed tropicbirds in the tropical Atlantic. Based on foraging movements of red-billed tropic birds, we propose a seaward extension of the National Park on Madeleine Island of 200 km radius and a sustainable fishery zone around St Helena to include main foraging areas of tropicbirds breeding on these two islands

11:15 Seabirds 3: Herculano Dinis, Teresa Militão, Laura Zango, Laura M. Stefan, Jacob González-Solís

Land-based threats and population viability of the endemic gadfly petrel of Cape Verde Island

Fea's Petrel (*Pterodroma feae*) is currently considered “near threatened”, but little is known about its population dynamics, breeding biology and on land threats, jeopardizing its management and conservation. We captured (CMR) birds using mist nets over eight years, monitored up to 12 nests in 2 years and deployed GPS devices on breeders in Fogo (Cape Verde). We set traps in the colony to control cat predation and investigated their domestic/feral origin by marking domestic cats from a nearby village with transponders, by deploying GPS devices on domestic cats and by performing stable isotope analyses (SIA) of their fur. CMR modelling estimated a Fea's Petrel population size of 223 birds [95% CI: 169-276]. Viability modelling suggested population will likely be extinct in 50 years and pointed out adult survival as the most sensitive parameter. While monitoring breeding performance, three adults were depredated by cats and two were killed by local people. Cats trapped within the colony, cats tracked with GPS, and comparison of SIA between domestic and trapped cats all suggest cats visiting the breeding colony are feral, not domestic. GPS tracks from breeders showed birds left and returned to the colony using the sector with the lowest level of public light, suggesting the species avoids light polluted areas. Fea's Petrel population in Fogo is threatened by feral cat predation and human exploitation, and may become extinct in few decades unless conservation actions to improve adult survival are

urgently applied. Population trends and main threats for the species in the remaining islands are unknown, although likely to be similar to Fogo, suggesting an uplisting of its conservation status is merited.

- 11:30 Seabirds 4: Jacob González-Solís, José Manuel Reyes-González, Zuzana Zajková, Raül Ramos

Using multi-year seabird tracks to improve adaptive management strategies: the Cory's Shearwater case

Assessing the spatio-temporal consistency of areas exploited by marine fauna is crucial to identify and develop habitat management plans. If habitat use changes from year to year, however, implementation and fulfilment of habitat management activities may need to change annually. Marine upwelling systems, such as the Canary Current Large Marine Ecosystem off north-west African coast, usually show high productivity and spatio-temporal predictability at large scales, and therefore are crucial foraging grounds for many marine top predators. However, at lower spatio-temporal scales consistency in the use of foraging grounds is poorly known. We evaluated the spatio-temporal consistency in the feeding grounds of Cory's Shearwaters (*Calonectris borealis*) breeding in Veneguera (Gran Canaria), by tracking foraging trips with GPS devices from 2011 to 2016. At large scale (> 300 km) birds consistently visited the African shelf over the years. However, at meso-scale (1-300 km), and at both population and intra-individual level, we found a low overlap among years, suggesting a low resource predictability and a high foraging plasticity. Distinctly, meso-scale annual variations in primary productivity in northern areas matched with spatial shifts in foraging areas at population level. Therefore, our results open new avenues to use multi-year tracking data of top predators and real-time environmental monitoring as tools to assess and modify adaptive management plans.

- 11:45 Seabirds 5: Justine Dossa, Ross M. Wanless

From seabird science and conservation to marine spatial planning and ecosystem-based approaches to fisheries management in West Africa

The Canary Current upwelling ecosystem constitutes one of the four main eastern boundary upwelling ecosystems of the world, being highly productive and hosting high-biomass fisheries. Fishing pressure in West Africa (WA) is huge, with massive annual catches from a diverse array of fleets and gear types. Management of fisheries in the region is amongst the least effective, evidenced by the huge scale of IUU fishing. Seabird bycatch occurs in WA and elsewhere it poses significant conservation threats to affected species. This is coupled with endemic, unsustainable fishing practices, by both foreign and domestic fleets. Overfishing has significant, long-term and unpredictable impacts on virtually the entire ecosystem, with top predators such as seabirds at particular risk. Migratory seabirds connect WA's marine ecosystems to distant ecosystems, suggesting that damage to one could affect the health of others. The MAVA Foundation has funded a seabird project in WA geared to identifying marine Important Bird and Biodiversity Areas (IBAs) and understanding threats to seabirds. Aside from creating new knowledge on at-sea distributions of seabirds in the region, the project outcomes will: support new Marine Protected Areas to be declared; integrate seabird conservation, through BirdLife's marine IBAs into national, regional and international marine spatial planning initiatives; create cross-links with various MEAs and strengthen fisheries management in national and regional spheres.

- 12:00 Seabirds 6: Maria Dias, Justine Dossa, Ben Lascelles, and Ross Wanless
Marine IBAs, a tool for marine spatial conservation management in West Africa.

BirdLife International has developed a standard methodology to identify marine Important Bird and Biodiversity Areas (marine IBAs), key areas for the conservation of the marine environment. To date, over 1000 marine IBAs have been designated all over the world. The marine IBAs are defined using a set of global and regional criteria, based on the abundance and regular presence of seabirds in important sites for their breeding, foraging, migration and maintenance behaviours. Under the West African Seabird conservation project - the Alcyon project - a large number of tracking data have been gathered since 2013: 25 datasets, for 10 seabird species, collected by tracking more than 900 individual birds. The analysis of these data using innovative techniques allowed BirdLife International to identify 12 IBAs in the marine environment of West Africa. Marine IBAs are important tools for marine conservation, given that they result from standardized analyses that allow the identification of key sites for seabirds based on information of the species abundance and on the importance of the areas for the most threatened species. Marine IBAs are therefore good candidate sites to be integrated in a network of Marine Protected Areas. We will describe the steps involved in delineation of marine IBAs in West Africa and show their importance for biodiversity conservation and fisheries management in this region.

- 12:15 Seabirds 7: Alioune Badara Marone, Justine Dossa, Amélie Lescroel, David Grémillet
Perceptions of Senegalese fishermen regarding interactions between seabirds and industrial fisheries

Maritime fishing plays an important role in Senegal's national economy. The industrial fleet is made up of 99 vessels. In order to understand interactions between Senegalese industrial fisheries and seabirds, standardized interviews based on questionnaires were conducted with 74 industrial fishers, including 43 trawlers (40% of the trawl fleet), all the tuna fishers (n=14), sardine fishers (n=11) and demersal longliners (n=6). These interviews were carried out at Dakar fishing port (Pier 10) between 3 and 15 November 2015. Based on the information gathered, 12% of trawlers and 15% of tuna fishers reported having regularly recorded bycatch of seabirds. For trawlers, most of the time the birds get caught in the nets or collide with fishing gear during trawling operations. In tuna longline vessels, it is more the drowning after being caught on hooks. The fishermen interviewed (tuna fishers and trawlers) admitted having captured between 2 and 5 birds per vessel annually. Elsewhere, 76% (all categories) of industrial fishers interviewed stated they had noticed a sharp reduction in the number of seabirds during the last ten years. These first results should be viewed with caution as the majority of fishermen interviewed are reluctant to talk about bycatch of protected species during fishing activities. It would be advisable to strengthen further this first information by direct observations on board the vessels.

- 12.30 Seabirds 8: Edna Correia, Aissa Regalla, José Pedro Granadeiro, Paulo Catry
Foraging behaviour of Terns in the Bijagos archipelago, Guinea-Bissau

Most tern species spend a large period of the annual cycle in their wintering grounds where conditions experienced can shape population size. However, very little is known on their wintering foraging ecology, particularly in the tropics. In the Bijagos archipelago, an area renowned for holding very important numbers of terns, Caspian and Royal Terns are frequent breeders, and Sandwich, Lesser Crested, Common, Little and Black Terns are mainly non-breeding visitors. Seabirds often feed in interaction with subsurface marine predators which influences the type of prey consumed by birds and their foraging success. In tropical waters where productivity is generally low but predatory fishes are often abundant, seabirds can depend to a large extent on these association. We carried out observations on terns foraging behaviour in the Bijagos archipelago. Here terns interact mostly with *Caranx hippos* and *Scomberomorus tritor* and we found differences among tern species in the degree of these associations. Black Terns fed almost exclusively in interaction

with predatory fishes whilst Little Terns were never seen in such interactions. Other terns seem to have an intermediate participation in these associations. However on average all species increase their dives rate when interacting with predatory fishes. In a future scenario of predatory fish abundance decline seabird species that mostly depend on this type of interaction to feed may show important changes in abundance and distribution.

Thursday 20th October 2016: 14:30 - 15:15

AMPHITHEATRE SINE SALOUM: Managing impacts on seabirds from forage fisheries, bycatch and the depletion of stocks (Part 3)

14:30 Seabirds 9: Wim C. Mullié, Sokhna Momie Thiaw, Almut E. Schlaich, Jan Veen
Foraging strategies of Caspian Terns, Royal Terns and Slender-billed Gulls during reproduction.

The Saloum Delta National Park holds important breeding colonies of Laridae and Sternidae such as Slender-billed Gull *Larus genei*, Caspian Tern *Hydroprogne caspia* and Royal Tern *Thalasseus maximus*. The number of breeding pairs of the latter two species are of international importance and among the largest in the world. Although their food has been well studied since 1998, little is known about their feeding ranges. For the two terns there are, however, clear indications of differences in diet of adults and of the chicks they feed. Bidirectional GPS dataloggers (UVA-BiTS) of 5.6 g were attached to three Slender-billed Gulls, six Caspian Terns and 17 Royal Terns. After standardization of received GPS fixes, individual daily tracks were analyzed for parameters such as total distance covered, maximum distance and time from the nest, and number of daily foraging flights. If known, three periods were distinguished: incubation, chick rearing and in some cases the period after chick loss. In both tern species, birds flew further from the nest and made longer foraging trips when incubating and stayed closer to the colony after chicks hatched. In contrast to the terns, Slender-billed Gulls had foraging trips that frequently lasted more than a day.

14:45 Seabirds 10: Médoune Diop, Dimingou Thiour, Patrice Brehmer, Ross Wanless, Oumar Sadio, Malick Diouf, Justine Dossa

Seabird interactions with small-scale fisheries in Senegal

With over 20,000 canoes, small-scale fishing is a particularly significant human activity in Senegal's ocean. A survey among small-scale fishermen was carried out to examine (i) fishermen's identification of seabird capacity (ii) their knowledge on seabird spatial distribution, (iii) fishermen's behavior related to birds and (iv) their empirical knowledge on bird feeding behaviour. Preliminary results using a stratified linear interpolation based on fishing practice show that around 66856 seabirds are captured each year. Northern Gannets, Pomarine Skua and Cape Verde Shearwaters are currently observed. Most fishermen stated that seabirds have a positive impact because they act as a free natural fish finder system and indicator of fish abundance. For small-scale fishermen, seabirds feed mainly on sardinella as well as the fish they use as bait. Indeed, 84% of them reported that the birds steal their bait and caught fish. The fishermen (59%) stated that they accidentally capture at least one seabird per year. Lastly, the majority of fishermen report a decrease of seabird population during the last decade. Interaction between Senegalese small-scale fishermen and seabirds appears to be strong and based on mutual benefit, which should enable the authorities and managers to propose mitigation measures to increase fishing efficiency and decrease seabird bycatch.

15:00 Seabirds 11: Vitor Paiva, Pedro Geraldès, Isabel Rodrigues, Tommy Melo, José Melo, Jaime A. Ramos

The foraging ecology of Cape Verde Shearwater, a sentinel for marine conservation off West Africa.

Seabirds are top predators often used as biodiversity indicators and sentinel species of the marine ecosystem health, thus frequently informing marine conservation planning. This study presents the first data on the spatial (GPS-loggers) and trophic (stable isotope analysis) ecology of the endangered Cape Verde Shearwater *Calonectris edwardsii*, during the incubation and chick-rearing periods of 2013 and 2014. There was inter-annual consistency in the spatial and trophic ecology of Cape Verde Shearwater, but a strong alteration on the foraging strategies among breeding phases (i.e. from incubation to chick-rearing). During incubation, birds mostly foraged in a region off West Africa (within Senegalese waters), known by its enhanced productivity profile and thus, also intensively exploited by international industrial fishery fleets. When chick-rearing, adults exploited the comparatively less productive tropical environment within the islands of Cape Verde, at relatively close distance from their breeding colony. The species enlarged its trophic niche and increased the trophic level of their prey from incubation to chick-rearing, likely to provision their chicks with a more diversified and better quality diet. There was a high overlap between the Cape Verde Shearwaters foraging areas with (1) the distribution of other shearwater species overwintering in this region and (2) known areas of marine megafauna bycatch off West Africa.

DJOUDJ: Enhancing scientific research to better drive and direct international policy (Part 1)

14:30 Policy Keynote: Temidayo Osinubi,

Linking science and policy to address conservation concerns in Africa

With growing concern about the status of biodiversity in Africa, there is an urgent need to find better alignment between scientific research and policies (national and international). National government policies and international Multilateral Environmental Agreements (MEAs) are essential tools for delivering on conservation agendas within countries and across continental regions, respectively. However, these tools need the direction provided by the scientific community through accurate data collection and analysis. Conversely, policies can serve science by indicating knowledge gaps in the effective implementation of conservation agendas. The aim is to present examples of existing models of science-policy agendas, while advocating for stronger linkages between science and policy

15:00 Policy 2: Alex Ngari, Samuel Temidayo Osinubi

Science as an international policy enabler and the African-Eurasian Migratory Landbirds Action Plan

African-Eurasian migratory landbirds have declined in recent time. Conservation of these species habitats is important because of their role as environmental indicators and providers of ecosystemic functions. BirdLife International has supported the development and implementation of the CMS/African-Eurasian Migratory Landbirds Action Plan (AEMLAP), a multilateral environmental policy instrument aimed at the conservation of migratory landbirds in the African-Eurasian flyways region. AEMLAP covers 128 countries (Africa, Europe, the Middle East & Central Asia) and 502 avian species. AEMLAP complements the efforts of the other multilateral environmental agreements. AEMLAP

employs a modular approach to address threats, mainly: habitat loss, taking & trade and disease & collision, while engaging the public and advancing scientific knowledge. Better information and robust data is fundamental to structuring effective conservation measures. AEMLAP structure incorporates research and monitoring functions. The Migrant Land Birds Study Group (MLSG) operates independently but acting as an avenue to supply information and fill knowledge gaps. This function, therefore, contributes to the shaping and enhancing of CMS/AEMLAP. The African-Eurasian Migratory Landbirds Working Group, which is itself a mechanism to implement AEMLAP, identifies knowledge and information gaps in conservation, while MLSG provides the platform for scientific enquiries to be executed and results fed into conservation.

Thursday 20th October 2016: 15:45 - 16:45

AMPHITHEATRE SINE SALOUM: Managing impacts on seabirds from forage fisheries, bycatch and the depletion of stocks (Part 4)

15:45 Seabirds 12: Pedro Geraldes, Nuno Oliveira

Identifying and interpreting bycatch in small scale fisheries in Portugal

Competition with fisheries and incidental capture in fishing gear are the major current threats for seabirds at sea. Fishing is a traditional activity in Portugal and is mainly composed of a great number of small vessels. Given the lack of knowledge on effects of the Portuguese fishing fleet on seabird populations, bycatch was assessed in mainland coastal waters for 2010-2012. Interviews and onboard data were divided into 5 strata, according to fishing gear: bottom trawling, bottom longline, purse seine, beach seine, polyvalent (≥ 12 m) and polyvalent (< 12 m). Polyvalent included setnets, traps and demersal longlines. Overall, 68 birds were recorded as bycatch. The average catch per unit effort (CPUE) was 0.05 birds per fishing event. Polyvalent (< 12 m), polyvalent (≥ 12 m) and purse seiners had the biggest seabird bycatch rates, with 0.5 (CPUE=0.1), 0.11 (CPUE=0.05) and 0.2 (CPUE=0.11) birds per trip, respectively. Within polyvalent gear, setnets captured the largest diversity of seabird species (CPUE=0.06), while demersal longline had the highest CPUE (0.86). The Northern Gannet was the most common bycatch species. Although more observation effort is required, our results suggest that substantial numbers of Balearic Shearwater might be caught annually, mainly in purse seine and setnets.

16:00 Seabirds 13: Ravidson Monteiro, Tommy Melo

Perceptions of fishermen regarding interactions between seabirds and artisanal fisheries in Cabo Verde islands

In Cabo Verde domestic fisheries are classified into 3 sectors: artisanal, semi-industrial and industrial. The artisanal fleet comprises boats ranging from 3 to 8 meters, which use hand-lines for large pelagic and demersal species, and purse seine, beach seine (arrasto de praia), gill net and dynamite for small pelagic species. The study took place from June to August 2015, to evaluate the perceptions of artisanal fishermen regarding the rates and types of their interactions with seabirds. We conducted standardized interviews with 265 artisanal fishermen from Santo Antão, São Vicente, São Nicolau, Boa vista and Fogo. Questions were divided into issues related to the fisherman and issues related to seabirds, always accompanied by a catalog for proper species identification by the fishermen. Descriptive analysis of the responses showed that 87% (n = 230) fish by hand and hook

lines, being the oldest traditional fishing gear used in Cabo Verde; 46.8% (n = 124) reported accidentally capturing more than 10 seabirds per year per fisherman, a considerable value, considering the 3717 artisanal fishermen in the archipelago. The most common by-catch seabird was the Cabo Verde Shearwater (*Calonectris edwardsii*) with 60.8% (n = 161) of fishermen reporting the case. Some fishermen mentioned that they release the birds alive: a good behavior to be promoted in the whole fishing community.

16:15 Seabirds 14: Davide Gaglio, Peter G. Ryan, Tim R. Cook, Richard B. Sherley

Why Swift Terns are winning the race?

High energetic demands in seabirds make them sensitive to changes in prey availability and this is often reflected in their diet. In the Benguela system the populations of endemic seabirds which rely on small pelagic commercial fish, have all decreased over the last few decades and are listed as threatened. In contrast the population of Swift Terns *Thalasseus bergii* has increased over the same period. To better understand this conflicting trends since 2013, we have investigated the diet of Swift Terns in the Western Cape, South Africa. Diet was assessed using a novel non-invasive methodology that uses digital photography. More than 24,000 prey items were recorded and standard lengths of fish were estimated. Results show that terns mainly rely on Anchovy (70%) which averaged 80 mm long. However, a wide range of other prey was also captured. Fine and large-scale temporal variation of Swift Tern diet was assessed and compared to data previously collected in the Western Cape. Understanding how Swift Terns cope with local reductions in pelagic fish availability in comparison to the other endemic seabirds is vital for assessing the impact of commercial fisheries on seabird populations and fish stocks.

16:30 Seabirds 15: Kees J. Camphuysen, Tom van Spanje, Den Helder, Frederic Marret

Seabirds off NW Africa: ecological interactions and conservation issues affecting two hemispheres

In the NE Atlantic, an area of upwelling extends from Portugal to Guinea (42°-10°N; the 'Canary Current'), with a most productive area around Cap Blanc (Mauritania, 21°N). Mauritanian waters are exceptionally important for seabirds, cetaceans, and other megafauna, but ecological studies or assessments of distribution patterns and habitat requirements are rare. Recent studies emphasised the global importance of this area for Arctic as well as Antarctic seabirds, as well as for regional (Macaronesian) species. Foraging assemblages rely largely on subsurface predators (fish, cetaceans), or physical oceanographic properties that enhance feeding conditions. Multi-species foraging associations are the rule rather than the exception. Through the annual cycle, overall abundance, species composition and ecological properties change continuously. Recent dedicated surveys were designed to reveal the most important temporal and spatial trends. As an area of high primary production, fish stocks attract industrial fisheries that are both widespread and poorly controlled. The impact of these fisheries varies, but include over-exploitation and provisioning (discards, for scavenging seabirds). The overexploitation of predatory fish species has indirect but highly significant effects on seabirds. We will also report recent evidence for direct exploitation of seabirds on a scale that would affect world populations of several taxa.

16:45 Seabirds 16: Laura Zango, Steve Votier, Teresa Militão, Peter Becker, Jacob González-Solís

Trophic structure of seabirds in the Canary Current using stable isotopes

Although trophic ecology of breeding seabirds has been broadly studied, barely nothing is known about wintering ones due to their inaccessibility in this period, where they migrate to high productive areas such as upwelling systems. The Canary Current (CC) is one of four major eastern boundary upwelling systems in the planet, supporting both, complex

communities of seabirds all year round and a large but poorly regulated fisheries. However, little is known about the dependence of seabirds on fishery discards, a key issue in political management. In this study, we studied the trophic structure of both breeding/oceanic and wintering/neritic seabird communities across the CC. We collated stable isotope of potential seabird prey and thirteen seabird species. In the case of the wintering species, birds were previously tracked with GLS to ensure they spent the winter in the CC. Functional groups of prey segregated in the isotopic space, with demersal fishes showing more enriched $\delta^{15}\text{N}$ values than pelagic ones. Both, seabirds and prey from the neritic environment showed more enriched $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values than those of the oceanic environment. Within each environment, all seabird species were placed in a relatively small isotopic space, presumably feeding on naturally caught preys and excluding a relevant dependence on discards. This is the first study that combines GLS data and isotopes from seabirds and their prey to understand their trophic and spatial community structure.

DJOUDJ: Enhancing scientific research to better drive and direct international policy (Part 2)

15:45 Policy 3: Adama Nana, Thandiwe Chikomo, Bernd de Bruijn, Danielle van Oijen

The multi actors co-operation for nature and people in the Sahel

The Africa-Eurasia flyway is one of principal ways by which million birds annually borrows Europe towards Africa and vice versa. During this migration, birds depend primarily on natural resources which are more than more under pressures of any nature. The research results (Zwarts and all, 2009) shows that the questions of migratory birds cannot be tackled separately of the demographic evolution, land use system in the Sahel, etc. Conscious of these problems of migratory birds, Birdlife International made a priority of it. Pilot project, "Living On The edge" (LOTE), was implemented between 2011-2015 by several partners and collaborators of Birdlife on 14 sites in West Africa. Its implementation showed that (i) agro forestry technique's and technologies of economy of firewood have significant impacts on bird's habitats, (ii) emergence of local leadership on sustainable natural resources management is a pledge of durability of migratory birds conservation initiative's, (iii) communities livelihoods improvement reinforces their mobilization for birds conservation, (iv) inter actors partnership reinforces decision maker's commitment for migratory conservation, (v) project results were a significant contribution in international advocacy on migratory land birds action plan (AEMLAP). This communication presents the experiment of Burkina Faso in the project and throws some prospects.

16:00 Policy 4: Kevin Y Njabo, Linda Zanontian, Frederic Paik Schoenberg, Thomas B Smith, Basma N. Sheta

Living with avian flu – persistence of the h5n1 highly pathogenic avian influenza virus in Egypt

H5N1 virus continues to cause mortality in poultry and threaten human health at a panzootic scale in Egypt since it was reported in 2006. While the early focus has been in Asia, recent evidence suggests that Egypt is an emerging epicenter for the disease. Despite control measures, epizootic transmission of the disease continues. We investigate the persistence of H5N1 across wild passerine birds and domestic poultry between 2009 and 2012 and the potential risk for continuous viral transmission in Egypt. We use a new weighted cross J-function to investigate the degree and spatial temporal nature of the clustering between infected birds of different types, and the risk of infection associated with direct contact with infected birds. While we found no infection in wild birds, outbreaks

occurred year round between 2009-2012, with a positive interaction between chickens and ducks. The disease was more present in the years 2010 and 2011 coinciding with the political unrest in the country. Egypt continues to experience endemic outbreaks of avian influenza H5N1 in poultry and an increased potential risk of infection to other species. With the current trends, the elimination of the H5N1 infection is highly unlikely. The application of spatial statistics techniques to these types of data may help us to understand the characteristics of the disease and may subsequently allow practitioners to explore possible preventive solutions.

16:15 Policy 5: Clémence Deschamps, Juan G. Lozano Arango, Pierre Defos du Rau, Elfirdous Elbashary Adam, Ettayeb Mohammed Eldegair, Manal Mohammed Ibrahim Bihery, Jean Yves Mondain-Monval

Using remote sensing and GIS tools to improve IWC scheme in Sudan

As a contracting Party to the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA), Sudan conducted and developed its International Waterbird Census (IWC) scheme in the last decade in cooperation with the Technical Support Unit to the AEWA African initiative. However, as only a few wetlands have been included to date in the current national IWC, it is currently unknown whether some waterbird strongholds might be missed and should be included in the IWC scheme. We are currently developing a remote sensing methodology over the whole Sudan to obtain winter flooded surface areas and other wetland-specific environmental covariates from Landsat imagery analysis and GIS tools. We then used five IWC field sessions conducted in Sudan between 2010 and 2014 from December to February to predict waterbird abundance using these wetland-related factors. This predictive model will be used to identify potential waterbird strongholds to be included in future IWC field sessions in order to contribute to the sampling of most important waterbird strongholds in Sudan.

Friday 21st October 2016: 09:45 - 10:30

AMPHITHEATRE SINE SALOUM: Producing policy-relevant information from waterbird and IBA monitoring (Part 1)

09:45 Waterbirds Keynote: Sergey Dereliev, Borja Heredia

The importance of waterbird population estimates in Africa

Waterbird population estimates are essential for the evaluation of their status, defining conservation priorities and enacting conservation action. The populations which are better monitored and their sizes and trends more regularly estimated, have, comparatively, a better conservation status. Population size and trend estimates are major criteria for listings under international treaties, such as AEWA. The AEWA listing is a dynamic process, which happens every three years. This allows for regular adjustments in the legal status of waterbirds catering for the need of measures for populations with a worsening status and relaxation of the status, for those that are doing well. This process is dependent on the quantity and quality of monitoring data, the absence of which can lead to a lack of justification for higher listing of populations in trouble. The 6th AEWA Conservation Status

report shows that the quality of population size estimates in the Afrotropical and West Asian-East African flyways is amongst the lowest. Along the Afrotropical flyway, only 14 out of 179 population estimates are census-based, while for 3 they are not available. Thus the bulk of the estimates are either a best guess or an expert opinion. This is also reflected in the quality of trend estimates with nearly 80% of the Afrotropical populations having poor or no trend estimates at all. Effective waterbird conservation starts with proper monitoring and this urgently needs to be addressed in Africa.

10:00 Waterbirds 1: Wim C. Mullié, Zeine el Abidine Ould Sidaty

Assessing spatial vulnerability of coastal bird assemblages to oil spills in Mauritania

Contrary to ornithological data from the Banc d'Arguin National Park (PNBA), Mauritania, few quantitative data are available on coastal birds along the c. 400 km of coast south of the PNBA. To fill this gap, from January 2013 till November 2015 twelve seasonal counts of coastal birds were made on exposed sandy beaches from Mamghar (southern limit of the PNBA) to Nouakchott (218 km) and from Nouakchott till Mbouyo (frontier with Senegal, 165 km). Birds included were those resting or feeding on the beach including those resting, flying or foraging on the first 100m at sea. Observations were done from a four-wheel drive vehicle driving at a speed of 30-40 km/h and stopping only for identifications. The main objective was to obtain spatial and temporal information of abundance and of group sizes per species and ultimately to assess where and when assemblages of coastal birds would likely be most at risk to be exposed in case of an oil spill. Counts were typically done during five to six days from High Tide + 2 hrs until Low Tide + 2 hrs while driving close to the High Tide line, to have a view of the upper part of the beach. Statistical analysis was performed on density data in relation to presence/absence of *Donax rugosus* (a small bivalve mollusc eaten by several waders), distance to the main fishing harbour along this coast (Nouakchott) and time of observation since High Tide.

DJOUDJ: Bird ringing in Africa - overview and the future

09:45 Ringing Keynote: Colin Jackson, Dieter Oschadleus

A bird in the hand is worth two in the bush

Bird ringing has played a critical role in our understanding of bird movements, taxonomy and ecology in Africa for over 100 years ever since the first trans-equatorial recovery in 1909 – a White Stork ringed in Germany and recovered in South Africa. Hundreds of thousands of birds have since been ringed across Africa and the data have contributed to the conservation of both Palearctic and Afrotropical species. Has such ringing now passed its 'sell by date' – overtaken by methods such as satellite tracking? Or is there still a future for ringing large numbers of birds? Should we only focus on single species or focussed research studies for ringing – or also encourage wider amateur citizen science ringer participation in growing our knowledge of African birds? We will consider these questions in the light of the current status of ringing in the continent and the enormous potential that we have within Africa as well as the significant challenges to broaden the scope of avian study and conservation through ringing. In particular, key areas will be explored such as training more African ringers and developing the long spoken of, Africa-wide 'AFRING' curation of ringing data, the sharing and accessibility of those data. Key issues will be addressed that are critical for producing data that can be confidently used such as comparable data collection methods and ageing codes for Afrotropical species across the continent, moult studies and in-the-hand identification and ageing guides.

10:15 Ringing 2: Alan Lee, Phoebe Barnard, Susan Cunningham, Michael Fraser, Chris Lennard, Dieter Oschadleus, Ben Smit, Les Underhill

Breaking Bergmann's Rule: records no selection of smaller body size with increasing T from SA

Biologists have hypothesized that climate warming will cause a reduction in organismal body size. This prediction is based on the trend of smaller body size of warm-blooded animals in warmer climates (Bergmann's rule). Evidence that climate warming is driving this pattern of selection in birds in recent times has been inconclusive. We examine a large ringing database from the winter rainfall region of South Africa across 61 species. We inspected 41 species for changes in tarsus length, wing length or body mass. We regressed the mean of these against mean annual temperature and rainfall data for the study region for the period 1984-2009. We find that <10% of species showed significant relationships between change in tarsus or wing measurements (considered more reliable estimates of body size) and the predictive climate variables, providing little support for Bergmann's rule. Nevertheless, >30% of species showed significant declines in body mass with increasing temperature, which was also linearly correlated with time. Body mass is generally a plastic trait and these patterns do not provide evidence for Bergman's rule, as we show that body mass and air temperature at time of capture are strongly correlated in one of the latter species.

Friday 21st October 2016: 11:00 - 12:30

AMPHITHEATRE SINE SALOUM: Producing policy-relevant information from waterbird and IBA monitoring (Part 2)

11:00 Waterbirds 2: Aissatou Yvette Diallo, Papa Ibnou Ndiaye

Comportement, nidification et distribution spatiale des Echasses blanche dans la ZICO des Niayes

Notre étude a porté sur la sélection des ressources par les Echasses blanches (*Himantopus himantopus himantopus*) dans la Zone d'Importance pour la Conservation des Oiseaux (ZICO) des Niayes. Les Niayes de Dakar constituent un écosystème particulier de zone humide, elles jouent un rôle déterminant dans la reproduction et la survie de beaucoup d'espèces d'oiseaux migrateurs et autochtones. L'étude s'est déroulée du 28 mai au 27 août 2012. Nous avons utilisé les méthodes d'observations focale et scan pour le dénombrement des effectifs et pour la détermination du comportement des oiseaux. Les données recueillies sur le terrain ont ensuite été exploitées en utilisant le logiciel de statistique R, qui nous a permis faire les statistiques exploratoires avec des graphes et de les analyser. Ainsi, nous avons pu dénombrer avant l'hivernage le plus grand nombre d'individus, 531 échasses blanches. Cependant, une nette diminution est notée après l'apparition des premières pluies et l'effectif s'est vu réduit à moitié en moins de trois semaines. Ces endroits semblent être aussi des milieux privilégiés pour la nidification de l'échasse, qui préfèrent éviter une submersion de leurs nids pendant la saison des pluies. Le maximum de nids actifs compté est de 25. Ceci est très intéressant car les études précédentes sur cette espèce ne signalaient pas plus de 5 nids au Sénégal. Parallèlement, un recensement des autres espèces d'oiseaux qui étaient présents dans la zone d'étude a été effectué.

- 11:15 Waterbirds 3: Pierre Defos du Rau, Wed Abdel Latif Ibrahim, Agency Hosni Asran, Laura Dami, Clémence Deschamps, Mohamed A. Ezat, Amr Hady, Haitham Ibrahim, Marie Suet, Jean-Yves Mondain-Monval

Improving waterbird monitoring on large water bodies of Africa: the case of the Nasser Lake (Egypt)

The International Waterbird Census (IWC) is one of the most widespread global biodiversity monitoring programs, allowing the assessment of waterbird populations and wetland conditions. These results can directly be used for the application of the African-Eurasian Waterbird Agreement and the Ramsar Convention. On the many large lakes and dams of Africa however, waterbird monitoring remains a methodological challenge because of the vastness of the area, as well as the visibility and accessibility problems in sampling waterbirds. The Nasser Lake is an Important Bird Area and the third largest artificial reservoir dam of Africa. In January 2015, we developed and tested in the field a simple sampling method to extrapolate and model waterbird abundance over the whole Nasser Lake perimeter i.e. approximately 10000km, which is presumably the first comprehensive waterbird survey of this extremely vast reservoir. Using remote sensing and GIS data layers, as well as generalised additive or linear models under quasi-poisson distribution, we modelled an estimated minimum abundance of 80000 waterbirds for the lake. This methodology could be applied with reasonable financial and technical means in most of the other large water bodies in Africa. We advocate for continuous training and support of field observers as well as for an increased effort allocation to these largest water bodies, as they are the most likely to hold largest fractions of the waterbird populations sampled during IWC.

- 11.30 Waterbirds 4: Marc van Roomen

Flyway trends of waterbirds in the East Atlantic flyway

The East Atlantic Flyway is used by many resident and migrant waterbirds along the coasts of Western Europe and Western Africa. Simultaneous counts of these populations provide the possibility to estimate total population sizes and flyway trends. This information is highly informative for site managers as they can compare numbers and trends of their local population with these flyway data which can tell them the importance of their sites and if trends at their sites are caused locally or by factors elsewhere. Results of such a simultaneous count of 2014 will be presented and patterns in distribution and trends described. This effort is part of a cooperation between the Wadden Sea Flyway Initiative, Wetlands International and BirdLife International to improve the monitoring and management of waterbirds along the flyway.

- 11.45 Waterbirds 5: Zeine El Abidine Sidatt

Parc National du Diawling important site de refuge et de conservation des oiseaux

Le Parc National du Diawling (PND), situé dans le bas delta du fleuve Sénégal (en Mauritanie), occupe une superficie d'environ 16 000ha répartie en trois bassins : Diawling-Tichilitt, Bell et Gambar. Les deux premiers bassins sont alimentés en eau par des ouvrages hydrauliques mis en place par l'OMVS pour restaurer d'anciennes plaines inondables et compenser les effets négatifs des aménagements hydrauliques destinés à bloquer la remontée de la langue salée. Les dénombrements annuels effectués de 2000 à 2016 ont permis de trouver 112 espèces d'oiseaux d'eau réparties dans les différents sites du PND. Certaines de ces espèces sont menacées ; et selon la liste rouge de l'UICN nous avons : 2 espèces vulnérables (*Acrocephalus paludicola* et *Balearica pavonina pavonina*) et 6 espèces quasi menacées (*Polemaetus bellicosus*, *Limosa limosa*, *Rhynchops flavirostris*, *Phoeniconaias minor*, *Aythya nyroca* et *Larus audouinii*). Le seuil de 1% de la population mondiale est atteint pour dix-neuf espèces. En plus, la reproduction de 56 espèces d'oiseaux y a été observée. Le PND et sa zone périphérique constituent l'une des plus grandes zones

de concentration des *Phoenicopterus roseus* en Afrique de l'Ouest et l'unique zone connue de nidification du *Phoeniconaias minordans* cette région.

DJOU DJ: Birds of the forest

11:00 Forests 1: Rajabu Mapunda, Jasson John

Effects of fire on understory nesting birds in montane forest, north-eastern Tanzania

The Eastern Arc Mountain is part of the Eastern Afromontane global biodiversity hotspot with high biodiversity and remarkable concentrations of endemic species. Although fire is not considered a major threat to these mountains, some of the blocks such as Ulugurus and West Usambaras have been seriously affected. However, there are very little data on how fires affect biodiversity in the areas. The study was conducted at Magamba Forest Nature Reserve, from December to January 2016, five years post fire. Nests were thoroughly searched in three burnt and three unburnt forest sites using time constrained method. A total of 175 active nests belonging to 27 species were recorded. Burnt forests had higher nest species diversity ($H' = 2.478$) than unburned forests ($H' = 2.012$) ($t = 2.7107$, $df = 149.74$ $p = 0.0075$). Low resilience endemic and forest specialist species, Usambara akalat and Spot throat had very few nests in burnt areas which indicates that frequent fires could seriously affect the survival of these species. The burnt areas are now being invaded with exotic Australian Acacia plant species which will escalate the fire regimes and change habitat structure of the forests. Further studies could investigate on the nest success rates in burnt and unburnt areas and the effect of invasive plant species to the biodiversity of this area. Meanwhile, plans for managing the invasive plant species and restoration of the burnt areas are required

11:15 Forests 2: Fred Barasa Munyekenye, Paul K. Nding'ang'a, Mercy N. Kariuki, Paul Muoria

Results from a participatory monitoring in the coastal Kenyan Forests

There are many key biodiversity areas in Kenya, among them are the coastal forests. To understand and reverse negative trends in good time within these forests, monitoring is necessary. Using the Important Bird Area (IBA) monitoring framework, a participatory approach, state (habitat condition), pressure (threats) and response (conservation action) indicators of twelve coastal Kenya forest IBAs were assessed from 2004 to 2011. Trends for these indicators were assessed at six sites for which sufficient data existed: Arabuko-Sokoke, Dakatcha Woodlands, Gede Ruins, Lower Tana River, Shimba Hills and Taita Hills, and baselines were described for remaining six. Changes were always small, but state deteriorated in Gede, Lower Tana and Shimba Hills, remained the same (unfavourable) in Arabuko-Sokoke and Dakatcha, and improved in Taita Hills. Pressure reduced in Arabuko-Sokoke, Dakatcha and Taita Hills, deteriorated in Lower Tana and Shimba Hills and remained the same (medium) in Gede. Response improved in Dakatcha, remained the same (medium) in Shimba Hills, and deteriorated in the rest. Based on the results, we do recommend increased conservation action through community engagement around protected areas and within the non-protected IBAs.

11:30 Forests 3: David Ehlers Smith, Yvette Ehlers Smith, Colleen Downs

Forest fragmentation affects avian species richness and functional communities in South Africa

In general, land-use change negatively affects biodiversity, so quantifying the ability of species to persist in modified environments is crucial. Birds maintain arguably the most

diverse range of functions in ecosystem dynamics; however, forest-bird specialists are sensitive to fragmentation, and are therefore susceptible to being replaced by generalist species, resulting in a decrease in functional niches. South Africa's Indian Ocean Coastal Belt Forest (IOCBF) is highly biodiverse, but is threatened by land-use change. Therefore, we investigated its effects on avian communities within the IOCBF across a gradient of forest and land-use types, patch sizes and isolation distances. Surveys were conducted within the non-breeding season, and repeated in the breeding season, using 285 x 10-minute fixed-radius point-counts of species richness and abundance. A general linear model indicated that regardless of forest or land-use type, decreasing patch size and increasing isolation distance had a highly significant negative effect on insectivore, nectarivore, and overall species richness and abundance. However, frugivore species richness and abundance were not significantly affected by fragmentation effects as there was an influx of generalist frugivores to smaller patches with larger edges. Thus, our results indicate that fragmentation is causing an increase in generalist frugivores at the expense of forest specialists, and potentially, ecosystem functionality.

11:45 Forests 4: Justin G D Byrne, Andrew Plumptre, Colin Beale

Range limits in the Afromontane bird communities of the Albertine Rift

The Albertine Rift is as an area of global conservation importance, supporting more endemic birds, mammals, and amphibians than any other African region and is home to over 50% of the continent's bird species. Although climate predictions for the region are uncertain, a general warming and hydrological cycle changes may disrupt the communities and disproportionately affect montane systems. By examining 16 years of survey data from 810 species collected at 6233 sites in 50 forests from between 650m and 4500m, we analysed the altitudinal limits to of bird distribution across mountains with different communities, and the shifts observed over time. We discovered that the same species show different altitudinal limits on different mountains, despite similar climate. Surprisingly, our results show that the same species show significantly more variation in upper altitudinal limits between mountains, than lower limits. This long term dataset, with broad geographical and taxonomic coverage, permits exploration of the roles of biotic interactions within bird communities and how they shape species distributions. We discuss our results within the context of global climate change and the risks to species within tropical mountains generally.

12:00 Forests 5: Mark Hulme, Juliet Vickery, Fiona Sanderson, Nicolas Tubbs

Biodiversity and REDD: Birds and land-use around Gola Rainforest National Park, Sierra Leone

REDD (Reducing Emissions from Deforestation and forest Degradation) seeks to fund forest conservation through the selling of carbon credits. Retaining carbon stocks should have a positive impact on biodiversity and livelihoods in the wider landscape. In assessing if this is the case an ongoing study focuses on bird communities in and around Gola Rainforest National Park (GRNP) in Sierra Leone, one of the first site-based REDD projects in Africa, and the impact that livelihood development work may have on biodiversity and connectivity, namely improved cocoa management with potential resultant reduction in slash-and-burn agriculture. We surveyed birds in forest inside GRNP and in forest and agricultural habitats in a surrounding 4km leakage belt. In total over 140 species were recorded, including a number of IUCN red-listed species and Upper Guinea endemics, both inside and outside the park. Forest-dependent and red-listed species were more prevalent inside GRNP but also more prevalent in community forest and plantation agriculture than in slash-and-burn. Generalists were less prevalent in all forested habitats and most prevalent in rice farms. Surveys will be repeated after the implementation of cocoa development work but initial results suggest that plantation agriculture might provide a better habitat for forest

biodiversity and connectivity between forest blocks than slash-and-burn. These findings can inform similar landscape-scale projects across the tropical forest zone.

12:15 Forests 6: Katharina Kühnert, Matthias Waltert, Ingo Grass

Effects of gallery-forest conversion on bird communities in the east of Guinea-Bissau

Little attention has been paid to the increased clearance of gallery forests in West African savannas and associated effects on bird communities. There, culturally protected sites, or sacred groves, often represent the last unlogged forest sections along rivers. This is also the case in the remote east of Guinea-Bissau, where we studied the bird community of four different habitat types to better understand the effects of gallery forest conversion. We counted birds in wooded savannas and three riparian habitats: sacred grove, secondary forest and annual culture. When annual cultures are left fallow for 4-6 years, they develop into secondary forests. We observed an overlap in community composition among wooded savannas and annual cultures. However, after only 4-6 years of fallow period, community composition of annual cultures apparently rebounds, as secondary forests are again much more similar in community composition to sacred groves. However, all habitat types were clearly distinct in community composition from sacred groves. Moreover, sacred groves hold most forest specialists and the highest number of insectivorous birds, despite a comparably low species richness. These findings demonstrate the importance of conserving primary habitats and stress the value of sacred sites for conservation.

Friday 21st October 2016: 13:30 - 14:45

AMPHITHEATRE SINE SALOUM: Autecology

13:30 Autecology 1: Bridget Ogolowa, Jacinta I. Abalaka, Shiiwua A. Manu, Ulf Ottosson

Distribution of *Lagonosticta sanguinodorsalis* in relation to food and water availability

The effect of food, water, vegetation variables and elevation on the distribution of Rock Firefinch *Lagonosticta sanguinodorsalis*, a habitat specialist with a narrow global range was investigated between April and June, 2015 in Jos Plateau, Nigeria. Diet was examined by administering 1.5ml saline solution orally to make the bird regurgitate. Soil samples from "present" sites (foraging sites with birds) as well as "absent" sites (suitable foraging sites without birds) were collected and germinated to fruiting. Food plants were identified by comparing regurgitated seeds with seeds from grown soils. Distance to water and elevation were measured with a GPS. Seeds and insects constituted its main diet. Hence, they are not strictly granivores as previously believed; its mass was also marginally higher in the rainy season when seeds are scarce than in the dry season when seeds are abundant. The abundance of food and vegetation variables was similar between "present" and "absent" sites. Distance to water was higher in the "present" than in the "absent" sites suggesting no role of distance to water. However, elevation may play a role in their distribution.

13:45 Autecology 2: Yverlin Pruvot

Biology and ecology of Sakalva Rail *Amauornis olivieri* in the Mandrozo Protected Area, western of Madagascar.

Biological and ecological study of Sakalava Rail *Amauornis olivieri*, an endangered and endemic waterbird of Madagascar, was conducted from July to October 2015 in the Mandrozo Protected Area, western part of Madagascar. Biological study was focused on reproduction. Three pairs belonging to three different nests were directly and continuously

observed. Nest construction was assured by two individuals of the pairs and lasted two days. The nests were constructed in deep tunnel of reeds *Phragmites mauritianus* located 56,67 cm on average above water level. The 13 matings observed in two pairs lasted 4,08 seconds on average. Egg laying was three eggs in each active nest. Incubation started since the first egg was laid. It was assured by the two sexes during 15 to 17 days. In each active nest, all eggs hatched out on the same day about one hour of interval. Both male and female participated in chicks breeding (chicks' incubation and feeding). Chicks remain only three days in the nest and they were completely independent of their parents at the end of 45 days. Sakalava rail eats invertebrates such as spiders, insects, crustaceans and mollusks. The Vital domains of two radio-tracked individuals were respectively 0,945 hectare and 1,98 hectare.

- 14:00 Autecology 3: Moses Chibesa, Barry Taylor, Ramesh Tharmalingam, Colleen T. Downs
Home range and habitat use of Trumpeter Hornbills in an urban-forest mosaic, Eshowe, South Africa

Despite the negative impacts of urbanisation, some species adapt to pressures of habitat loss and fragmentation. Trumpeter Hornbills *Bycanistes bucinator* are a large avian forest frugivore that uses urban environments in South Africa. Consequently, we used GPS/UHF transmitters to study their home range size, movement and habitat preference in an urban-forest mosaic in Eshowe, South Africa from March to October 2014. We estimated the home range size using three methods (MCP, KDE and LoCoH). Our results showed that overall mean monthly home range size was (mean \pm SE) $5.1 \pm 1.28 \text{ km}^2$ (95% MCP), $4.6 \pm 1.14 \text{ km}^2$ (95% KDE) and $1.9 \pm 0.46 \text{ km}^2$ (95% LoCoH). However, individual home range sizes varied monthly and seasonally. We found that all individuals tagged used mostly the indigenous forest and frequently utilised urban residential areas (gardens) with little or no use for cultivated land. Observed individual variations in monthly and seasonal home ranges could be a response to variations in availability of key fruit resources in the urban residential and indigenous forest mosaic. This study supports the use of more than one method of home range estimation for insight regarding home range and habitat use in urban-forest mosaics for this large forest frugivore.

- 14:15 Autecology 4: Rabi'a Ryklief, Lorien Pichegru, David Grémillet, Peter Ryan, Janet Coetzee, Pierre Pistorius

Behavioural responses of Cape gannets to ecological influences and nutritional stress

The foraging behaviour of the Cape gannet *Morus capensis* in South Africa is greatly influenced by small pelagic fish stock dynamics. These stocks are of economic importance and have been impacted by climate-mediated regime shifts. Corticosterone has been identified as an influencer of foraging behaviour in birds in that it mobilizes energy stores. These physiological adjustments contextualise the behavioural responses observed in relation to changing environmental conditions. We investigated behavioural responses of two Cape gannet colonies subjected to contrasting environmental conditions. One population at Malgas Island, in the Benguela bioregion, is characterised by a declining population trend and sub-optimal diet, whilst the other at Bird Island in the Agulhas bioregion has been increasing with an apparently healthy prey base, despite greater intra-specific competition. GPS tracks of foraging Cape gannets were collected from both colonies during five consecutive breeding seasons. Oceanographic variables did not appear to have a significant influence however prey distribution varied substantially between years resulting in associated shifts in foraging behaviour. Blood samples were only collected during a single breeding season. Cape gannets at Bird Island had a higher foraging success than gannets at Malgas Island, indicating that the latter were experiencing some degree of nutritional stress.

- 14:30 Autecology 5: Arjun Amar, Gabriella R. M. Leighton, Alexandre Roulin, Pierre S. Hugo
Just Google it: using Google Images to describe geographical variation in visible traits of birds

Information on the spatial distribution of phenotypic traits can be important for evolutionary and ecological studies. However, traditional approaches, such as fieldwork, can be time-consuming and expensive. Information technologies, such as Internet search engines, could facilitate the collection of these data. We investigated the use of Google Images to extract data on geographical variation in phenotypic traits visible from photographs. We compared the distribution of visual traits obtained from Google Images with four previous studies (1 mammal and 3 bird case studies). We found very good agreement between fieldwork data and Google Images data across all studies. Additionally, we developed a free-to-use web application (MORPHIC) which facilitates the data capture of this method. Our results suggest that this method can work well for visible traits of common and widespread species that are objective, binary, and easy to see irrespective of angle. The Google Images method is cost-effective and rapid and can be used with some confidence when investigating patterns of geographical variation, as well as a range of other applications. In many cases, it could therefore supplement or replace fieldwork.

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- 13:30 Forests 7: Yvette Ehlers Smith, David Ehlers Smith, Tharmalingam Ramesh, Colleen Downs

Using camera traps to model occupancy of spotted ground thrush in South Africa's coastal forests

The spotted ground thrush (*Zoothera guttata*; SGT) is an endangered forest specialist whose distribution is poorly understood along the Indian Ocean Coastal Belt Forest (IOCBF) on South Africa's east coast. More than 70% of the IOCBF has been lost to development, resulting in fragmented forest remnants within a mosaic of different land uses. We conducted camera-trap surveys with 5796 trap-days in 82 forest patches of various sizes across a gradient of land-use types in the IOCBF during the winter seasons of 2014-2016 to establish occupancy (Ψ) of SGT. We used occupancy modelling and incorporated microhabitat characteristics and surrounding land-use classifications to compare sites and determine SGT distribution across the habitat mosaic. The top model estimated an average $\Psi = 0.36 \pm 0.09$ and detection probability (P) = 0.11 ± 0.03 . At the landscape scale, larger patch sizes had a higher Ψ of SGT while P decreased with proximity to cultivated land. At the microhabitat scale, a high percentage of bare ground influenced Ψ positively. Short grass cover had a negative influence on P , while short herbaceous cover and high stem density of large (11-15 m) trees influenced P positively. These results detail the influence of landscape scale factors including habitat fragmentation and conversion to agriculture in conjunction with fine-scale site-specific characteristics, on patch selection and distribution of a cryptic, ground-dwelling species that is both threatened and under-studied.

- 13:45 Forests 8: Bertin Murhabale Cisitika, Charles Kahindo, Ben Marks

L'exploitation illicite des ressources naturelles dans le massif d'Itombwe, une menace majeure pour les espèces d'oiseaux endémiques et importants pour la conservation des forêts de montagne du Rift Albertin

Le massif d'Itombwe est l'une des ZICO les plus importantes d'Afrique sub-saharienne. Malheureusement il est parmi les sites mal connus avec peu d'efforts de conservation. Son avifaune est essentiellement connue grâce aux travaux de Prigogine (1971, 1976, 1977...) et de Butynski et al. (1997), ce dernier n'ayant couvert qu'une infime

portion du massif. Par ailleurs la distribution spatiale des espèces d'oiseaux importants pour la conservation dans ce site n'est pas encore établie. Bien qu'Itombwe ait connu les affres des guerres successives ainsi que de l'instabilité socio-politique dans la région les trois dernières décennies, aucune étude n'a été menée jusque-là pour en évaluer l'ampleur sur la biodiversité. Depuis 2015, le département de Biologie de l'UOB a réalisé quelques descentes sur terrain dans le secteur nord d'Itombwe afin d'évaluer par la capture au filet la biodiversité aviaire de cette partie gérée par l'autorité coutumière de Burhinyi. Au total 83 espèces d'oiseaux ont été inventoriés pour la plupart toutes d'intérêt global pour la conservation des forêts montagnardes. Toutefois l'avenir est incertain pour toutes ces espèces si aucune action n'est menée pour réduire l'ampleur des activités illégales en cours au sein de ce site notamment la déforestation, l'exploitation des minerais surtout par les groupes armés.

14:00 Predation: Adewale Awoyemi, Soladoye Iwajomo, Ulf Ottosson, Adams Chaskda

Patterns in avian nest predation in north-central Nigeria: an experimental study

An important step in understanding how best to conserve avian species is determining the factors that may affect their populations. Nest predation is one of the most important factors affecting their reproductive success. We used artificial nests to experimentally investigate factors contributing to avian nest predation rate in north-central Nigeria. We also studied the nest predator community in the area using camera traps. We placed two hundred and forty nests in four different habitats, on the ground and in canopy. In order to investigate the influence of investigators' activities on the probability of nest predation, one hundred and sixty nests were visited every two days while the remaining eighty were visited only twice. Camera traps revealed that, the African Giant Pouched Rat (*Cricetomys gambianus*), Tantalus Monkey (*Chlorocebus tantalus*) and Black Rat (*Rattus rattus*) were responsible for 47%, 40% and 13% of the captured predation events respectively. Nest predation rate significantly differed between ground and elevated nests, but this effect of nest position varied according to habitat, while grass cover negatively correlated with predation rate for ground nests. These findings enhance our understanding of likely nest predators in the study area, and of the effects of habitat on nest predation risk.

14:15 Immunity: Nwaogu Chima Josiah, Will Cresswell, Irene Tieleman

Variation in immune function may arise from resource seasonality in a tropical savannah environment

Variation in environmental condition influence food availability and pathogen dynamics, and this may impact individual condition and exposure to infection; causing immune function to vary consistently. In West African savannahs, birds range widely but cluster around fewer available food and water in the dry season. As a consequence, contact with infected wildlife and free ranging poultry may increase. Moreover, impoverished foraging conditions may cause organisms to become more susceptible to infection. We predict that immune function will be higher in the dry and for birds foraging at closer proximity to human settlements; either as adaptation or consequence of higher infection risk. We measured four immune indices: Lysis and agglutination titres and haptoglobin and ovotransferin concentrations from Common Bulbuls *Pycnonotus barbatus* sampled between January and November 2014 in locations that differ in proximity to human settlements around the Amurum Forest Reserve, Nigeria. Variation in immune function was consistent with predictions: immune indices were significantly higher and more variable between sites in the dry season but differences between sampling locations were not consistent with proximity to human settlements. Observations highlight possible impact of environmental conditions on immune function and suggest that climate and land use changes may predispose organisms to infection.

14:30 Papyrus: Lynda Donaldson, Robert J Wilson, Ilya MD Maclean

The effective conservation of papyrus endemic birds in Uganda

Papyrus (*Cyperus papyrus*) swamps in sub-Saharan Africa support the livelihoods of millions of people through the provision of a variety of ecosystem goods and services. These swamps also host a unique biodiversity, including of a suite of endemic bird species such as the globally threatened papyrus yellow warbler (*Chloropeta gracilirostris*). Papyrus swamps are under severe threat from habitat loss and degradation, thus these species are some of the most threatened and inadequately protected in the region, undergoing even greater declines than their habitat. Using data collected from swamps in an area of south west Uganda, we demonstrate that papyrus endemic birds are tolerant to low intensity resource use, highlighting that the conservation of these birds is compatible with sustaining human livelihoods. Despite the fragmented nature of this habitat, current efforts to protect these species are largely site-based, focusing on swamps hosting high numbers of birds. However, using metapopulation models, we identify the levels of threat to these species and show that conserving networks of swamps is required for their long-term survival. The broader implications of our work to inform strategic conservation planning and ensure the effective prioritisation of resources, with due consideration for local livelihoods, will be discussed.

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