MTA ÖKOLÓGIAI KUTATÓKÖZPONT
Centre for Ecological Research

5th Student Conference on Conservation Science, Tihany 2019

SCCS Europe - Connecting Eastern and Western Europe in conservation biology

Tihany (Lake Balaton), Hungary
27 – 31 August 2019

ABSTRACTS

Eds: N. Vili, A. Báldi, A. Kovács-Hostyánszki, K. Mázsa
MTA Centre for Ecological Research
http://sccs.okologia.mta.hu/

Background of the conference

The Student Conference on Conservation Science series started in Cambridge and has expanded with Brisbane, Beijing, Bangalore and New York.

SCCS is the largest international conference in conservation science, where students and early career scientists are welcomed and have the chance to present their research, learn from each other and meet with experts of the field who can offer them guidance in their future careers. In 2015, Hungary joined this inspiring event and began to organize the SCCS conference in Tihany, especially for young scientists from all around Europe to build a network among the presented parts of the continent.

Participants of the 5th SCCS Europe 2019

Plenary speakers at the SCCS Europe 2019

Dr Irina Herzon

Dr Irina Herzon based in the Department of Agricultural Sciences, University of Helsinki holds a degree in Biology and a PhD in Agroecology. Her expertise includes socio-ecological research with an emphasis on agri-environmental policy in Finland and the EU context. One of her research skills is in bridging ecological understanding and land managers' attitudes for fostering biodiversity-friendly land use practices. Irina had published several review papers on aspect of sustainable agricultural land-use, also regarding "East-West" European debate and High Nature Value farming. She was involved in several policy reviews for European Commission. Irina has served a responsible person and principle investigator for other international and national projects that included collection of ecological data, stakeholder interviews and production of advisory materials. Outside research, Irina has worked as an advisor to BirdLife International's Agricultural Task Force and served as a member on multiple ministerial working groups developing the national agri-environmental policy. As a university lecturer, Irina has been teaching many university courses on various aspects of agroecology, sustainable agriculture and conservation on farmland. (website)

Prof. Bengt Gunnar Jonsson

Bengt Gunnar Jonsson is a professor of Plant Ecology, at the Mid Sweden University. His research focuses on forest history and dynamics and its role in maintaining forest biodiversity. He is president of the Society for Conservation Biology - Europe Section, member of the Swedish Environmental Protection Agency Environmental Research Board, and was a lead author of the IPBES regional assessment of Europa and Central Asia. He

published 116 scientific publications and 30 popular sciences publications. In total 3665 citations and H-index 37 (Web of Science January 2019).

Dr. Eszter Kelemen

I have an MSc in Economics and a PhD in Environmental Sciences. My main research interest is the deliberative and socio- cultural valuation of ecosystem services and nature in general, which allows me to develop a critical standpoint on how and by whom value is defined, and how shifts in value systems can be achieved. Most of my research has a strong empirical element, using various tools to engage diverse knowledge holders in research. I especially like experimenting with visual, arts-based and action research methodologies. Since the last year I work together on such methodological innovations with university students in the frame of an Ecological Economics research seminar at the Eötvös Lorant University, Budapest. To earn a global perspective, I have been engaging with IPBES in the last four years, first as part of the valuation expert group, then as a lead author of the global assessment, and currently as lead author of the values assessment.

Affiliation: ESSRG Ltd., Budapest, Hungary & Institute of Sociology, Hungarian Academy of Sciences, Budapest, Hungary

Dr. Juliet Vickery

Juliet Vickery is Head of International Research, Centre of Conservation Science, Royal Society for the Protection of Birds (RSPB) and an Honorary Research Fellow at the University of Cambridge. She manages a team of scientists undertaking research in

collaboration with partner organisations throughout the world. This research underpins conservation solutions for biological diversity at the species, site and habitat level. Her key personal interests are the causes of declines of and potential conservation action required for Afro-Palearctic migrant land birds, the problems relating to the impact of agriculture on biodiversity in temperate and tropical systems and the impact of invasive non-native species on the ecosystems of UK Overseas Territories.

Awards SCCS Europe 2019

Best Talk Award went to *Csenge Horváth*, for the oral presentation entitled Comparing the short-term responses of the understory vegetation to different experimental forestry treatments and

Julia Piko, for the oral presentation entitled Effects of three different flower field types on pollinator diversity and plant-pollinator interactions

The runner up for the best talk was *Dávid Korányi*, with his presentation Effects of urbanization on bird communities in different types of green spaces

Best Poster Award went to *Tiffany Ki*, for the poster presentation entitled Lead away - uncovering regional drivers of English and Welsh Mute Swan population change, *Cygnus olor*

The runner up for the best poster was *Emma A. Ward*, with her poster Comparison of replantation methods of *Posidonia oceanica* storm fragments in the Aegean Sea, with the use of biodegradable materials.

The award for the best talk and poster comprised of a one-year membership of Fauna & Flora International, with a subscription to the journal Oryx, along with a book package offered by the Cambridge University Press.

The award for the runner-up talk and poster comprised of a one-year membership of Fauna & Flora International, with a subscription to the journal Oryx.

The COMMUNITY ECOLOGY AWARD offered by the journal Community Ecology for the presentation mostly relevant to multi-species problems went to *Andreas Wiedenmann*. His presentation - Farmland bird activity and arthropod biomass in three differently managed types of flower fields in Southern Lower Saxony, Germany - was invited to the journal and he also received a one-year subscription to the journal.

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Katalin Mázsa - Centre for Ecological Research, Hungarian Academy of Sciences

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Nóra Tugyi - Centre for Ecological Research, Hungarian Academy of Sciences, Balaton Limnological Institute

Nóra Vili - University of Veterinary Medicine, Budapest

Talks and posters

of the

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Refuges from fire maintain pollinator-plant interaction networks

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Species in mutualistic interactions are often highly sensitive to disturbances like fire events, but the complexity of their responses are unclear. We use bipartite insect-flower interaction networks across a recently burned landscape to explore how pollinator-plant interaction networks respond to a recent major fire event at the landscape level. We also investigate the effectiveness of refuges at different elevations (valley to hilltop) for the conservation of displaced pollinators during fire

We observed pollinator-plant interactions in natural areas of Greater Cape Floristic Region biodiversity hotspot, which is species rich in plants and pollinators. We established network properties using the bipartite package and compared Network and species specialization, Normalised degree and network nestedness across fire classes (Burned, Refuge and Unburned). We also estimated variation in pollinator and flowering plant species composition and abundance across fire classes using mixed models

Highest interaction activity was in the fire refuges, and least in burned areas. Interactions also tracked flower abundance, which was highest in fire refuges in the valley, and lowest in burned areas. Interactions

consisted mostly of specialized flower-visitors, especially in refuge areas. The interaction network and species specialization were lowest in burned areas. However, species common to at least two fire classes showed no significant difference in species specialization.

Flower-rich fire refuges sustain plant-pollinator interactions, especially those involving specialized species, in fire-disturbed landscape. This may be an important shelter for specialized pollinators species at the time that the burned landscape goes through regrowth and succession as part of ecosystem recovery process after a major fire event

Annual survival of adult Great Tits in different types of breeding habitat

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How could the urban Great Tits populations exsist, when their nesting success is much lower than the rural sites populations? Maybe, the Great Tits who lives in the city has better chance for the surviving that the ones who live in the forest? In this study, we investigate the annual survival probability of two urban sites and two forest sites Great Tit populations to answer this question.

We color ringed the breeding birds to collect re-sighting datas for five years and analised data with Cormack-Jolly-Seber modells and tested the area, sex and the year effect for the annual survival and recapture probability

The great tits avarage annual survival probability was 0,454 according to the best modell. The effect of urbanization and sex wasn´t consistent, but we got significant difference between years.

Greater understanding of the consequences of increasingly urbanising world for the demography of animal populations is likely to be an essential component for conserving biodiversity in our towns and cities.

Development of seed transfer zones for ecological restoration in Hungary

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Distribution of local seed mixtures avoiding maladaptation and genetic pollution for successful restoration projects through the creation of seed transfers zones based in environmental variables linked with vegetation.

Use of three bio-geographic based maps to obtain an intersected map filled with MPNV data and clustered to produce seven contiguous units that can serve as Seed transfer zones. Evaluation of certainty and calculation of agreement level and comparison with the administrative map that currently rule the local seed distribution for restoration projects.

The main result of the study is the production of the STZ map that could replace the present regulation. The STZs overlap with those of the clustered base maps at a much higher rate (59.7%) than those of the NUTS2 regions (33.4%).

In the lack of genetic data, a method based on filling bio-geographical map polygons with high resolution MPNV data and clustering them to form applicable number of units can serve as a general proxy for delineating seed zones for multiple herbaceous species. In order to fulfill its purpose, seed transfer regulation for restoration should be changed.

Community Participation in Bustard Conservation in Kutch, Gujarat, India.

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The Corbett Foundation

Less than 25 individuals of the Great Indian Bustard (*Ardeotis nigriceps*) are struggling to survive in an agro-pastoral landscape in Kutch region of Gujarat State in India. Rapidly changing crop-pattern and excessive usage of pesticide may harm this species and its food chain. This problem can be solved only through the participation of farmers in its conservation. We have worked on this line and have achieved first step of success in it.

This has been a community based conservation effort where the local farmers were trained and convinced to opt for the organic farming of traditional crop. A model of 'rotational control grazing system' is also being implemented to ensure the longterm survival of the grasslands.

We initiated with just two farmers and today we have more than 65 farmers from different villages of core-bustard habitat who are ready to opt for the organic farming of traditional crops.

Through this efforts, now more farmers are willing to join this movment of getting involved in conservation through the organic farming.

This model will also benifit the other insectivorous bird speceis found in and around such farms.

Importance of Road-verges in conserving grassland arthropod fauna.

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We aim to study the species richness and functional diversity of the arthropod fauna of forest-steppe (F) patches, pastures (P), and road-verges (R) in exotic forest plantations. We focus on addressing the following questions: (1) do linear grassy stripes along road verges have a role in maintaining the steppe species of arthropods? (2) Are the forest steppe grasslands different from pastures in terms of species and functional trait composition and functional diversity (RaoQ)?

We calculated Community Weighted Mean (CWM) for three traits (Shading tolerance, moisture preference and dispersal ability) of the spiders, true bugs and, ants. We used the multivariate RaoQ index to characterize functional diversity and an indicator value analysis to identify the characteristic species in three habitats. We used General Linear Models (GLMs) to determine the effect of habitat type (F, P or R) on species richness and functional diversity indices.

We observed higher species richness in road verges for spiders and ants. We also found higher functional diversity values for spiders and different trait composition for all taxa in road verges when compared with forest steppes and pastures. We found that the forest steppes have higher species richness of spiders than pastures, and we found

differences in species composition of the two habitat types for all taxa based on the multivariate analyses

Our results indicate that road verges should be considered as an important reserve for grassland specialist arthropods, as they provide secondary linear habitats for many arthropod species, and we would also suggest the maintenance of these grassy stripes in order to preserve natural biodiversity in exotic forests.

Comparing the short-term responses of the understory vegetation to different experimental forestry treatments

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By recognizing the need for multipurpose forest management, which is able to sustain the regeneration and biodiversity of the forest ecosystems, it has become increasingly important to conduct studies that compare the ecological impacts of different silvicultural practices.

In the Pilis Forestry Systems Experiment four experimental silvicultural treatments (clear-cutting, retention tree group in the clear-cut, partial cutting and gap cutting) have been carried out in a sessile oak-hornbeam forest in 2014. Based on a 2016 study we investigated the responses of the understory vegetation in 2018. We surveyed the cover of the understory plant species and compared the treatments' effects on species richness, total cover, and on the cover of four plant functional groups.

Four years after the harvests the total cover and species richness have increased the most in clear-cuts and gap-cuts, moderately in partial cuts and only slightly in retention tree groups. The cover of woody plants increased the most in partial cuts, while annuals had the greatest cover in clear-cuts and gaps, albeit their cover decreased significantly between 2016 and 2018. The species composition has changed the most in clear-cuts where the altered conditions favoured mainly non-forest herbs.

In partial cuts and retention tree groups the minor changes indicate that these treatments can mitigate the effects of the final cutting for some extent. In gaps only the cover of woody plants keeps rising and species typical of woodlands and woodland edges can prevail. The most favourable conditions for forest herbs and woody regeneration were in gap-cuts and partial cuts, implying that harvesting methods sustaining continuous forest cover may be beneficial both economically and ecologically.

Effects of urbanization on bird communities in different types of green spaces

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Urbanization is one of the most intensive form of landscape transformation which contributes to the decline of natural habitats, resulting species loss, biotic and functional homogenization in communities of many taxonomic groups. We focused on the effects of different types of green habitats and urbanization on bird communities.

We recorded birds using point-count method in 17 allotments and 17 parks in Göttingen, Germany, along an urbanization gradient by calculating sealed area percentage within a 500 m radius for each sites.

Urbanization had no effect on biodiversity, functional traits and community composition of birds. Nevertheless, we found greater species richness, more large-bodied, tropical migrant and tree nester species in parks compared to allotments, where more cavity nester and resident birds were recorded. Habitat type also affected avian community composition as six species showed preference for allotments, whereas seven species were associated with parks.

Our results showed that urban green areas have a determinant role in mitigating the urbanization effects on bird communities. Among these areas the role of parks is outstanding, as they contribute significantly to biodiversity conservation and to the presence of urban avoider species due to their vegetation characteristic (e.g. higher tree coverage).

Assessing the naturalness of Hungarian forests based on naturalness criteria

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Forests are the most complex terrestrial ecosystems. Large portion of plant and animal species have a connection with them. Many conservation problems have direct or indirect impacts on forests and cause biodiversity loss. There could be two ways to solve this problem: "land sharing or land sparing", which means we designate unmanaged areas or doing close-to-nature forest management or combining these approaches. To make a judgement, we must assess the effects of the management on biodiversity.

We have several opportunities to assess the management effects. Our previous project's fine scale database contains more than 60.000 sampling points from the Northern Hungarian Mts. The methods were developed to support a multipurpose assessment serving forest biodiversity conservation. We can compare these data with the National Forestry Database (NFD), we can find forest state indicator variables, and we can conclude the forest state in indirect way (through natural disturbances effects).

Most of our work are in progress. We have results of the 2014's ice disturbance on the forests in the Börzsöny Mts.: The Pogány-Rózsás Forest Reserve, which has been unmanaged for some decades, was affected by the ice break. Compared with the managed forests, the effects of ice break were slightly less serious in the Reserve. The better

conservation status (more admixed tree species, more age classes in the stand, etc.) could be in the background of this phenomenon.

We foresee methodological and descriptive results. Through the comparison of our data with the NFD we can evaluate its conservation data's usefulness and make suggestions for NATURA2000 reports in forest habitats' conservation status assessments. We could assess the conservation status of forests under different management regimes: strict Forest Reserves, age-class forestry or close-to-nature management in the study areas, which could lead for a possible solution of the mentioned problem.

Landscape compositional and configurational heterogeneity affects bird communities at local scale in fragmented habitats of the Great Hungarian Plane

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Sustainable biodiversity conservation projects often require strategies to manage human-related landscapes (e.g. agricultural areas) based on a better understanding of their complex roles on biodiversity and ecosystem function. This work focuses on the effects of landscape structure (amount of hostile matrix and isolation of fragments) and local fragment size on bird communities in two fragmented habitats (forest-steppe and kurgan) in the Great Hungarian Plain.

We performed bird point count surveys at 60 sites in the Great Hungarian Plain (30 each fragment type) in two periods (late April and late May 2019) during peak activity hours (from 05:00 a.m. to 10:00 a.m.). Bird were identified both by visual detection and acoustic identification.

From our preliminary results, forest-steppe and kurgan can be characterized by different bird communities. Fragment size had positive effects on bird populations in forest-steppe fragments (well connected fragments), whereas hostile matrix and fragment size, had no effect on bird populations in kurgan fragments (highly isolated fragments). Ground nesting birds were favored by the increase of fragment size in forest-steppe and by the percentage of grassland around site in kurgan area.

Forest-steppe patches preserve a good connection between the patches, probably favored by the almost continuous cover of artificial pine plantations, although an increase of fragments size can enhance the biodiversity of bird communities in this area. Contrarily, kurgans need an urgent change in management strategies as the agricultural intensification (loss of grassland) compromise the maintenance of habitat corridor between these fragments threatening the populations of ground nesting birds.

Fifty Shades of Blue – Extra-pair paternity and intraspecific brood parasitism in the Red-footed Falcon

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The Red-footed falcon is a highly protected species in Hungary. However there are several conservation efforts for increase the population number, the mating system is hardly known. Getting more informations about the reproductive strategies of Red-footed Falcons we can create more effective conservation programs.

I used newly described species-specific microsatellites developed by our research group and cross-species microsatellites markers to genotype 45 families.

I found a low rate of extra-pair paternitiy (EPP) which seems to be typical for falcons. As far as the intraspecific brood parasitism (IBP) is concerned there are only a few informations about its frequency among falcons. During my research I found the rate of IBP twofold of the rate of EPP.

There are several hypotheses about the explanation of extra-pair copulations (EPC). The aspects that can affect the reproductive strategies are mostly the same which ones underlying in the background of reproductive success. With our results we can get closer to the understanding of the breeding biology of the Red-footed Falcon.

Text-analysis reveals taxonomic and geographic disparities in animal pollination literature

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Ecological systematic reviews and meta-analyses have significantly increased our understanding of global biodiversity decline. However, for some ecological groups incomplete and biased data has hindered our ability to construct robust, predictive models. One such group consists of the animal pollinators. 88% of wild and crop plant species are thought to be pollinated by animals, with an estimated annual value of $230-410 billion dollars.

Here we apply text-analysis (named entity recognition) to quantify the taxonomic and geographical distribution of the animal pollinator literature, both temporally and spatially.

We show that the publication of pollinator literature increased rapidly in the 1980s and 1990s. Taxonomically, we show that the distribution of pollinator literature is concentrated in the honeybees (Apis) and bumblebees (Bombus), and geographically in North America and Europe. Although these results indicate strong biases, pollinator literature is not entirely restricted to Apis and Bombus, and a large number of studies outside North America and Europe do exist.

We suggest how text-analysis could be used to collate a more representative set of literature, in turn enabling more robust modelling of pollinator biodiversity. We also discuss how text-analysis algorithms could be used to address more applied conservation questions related

to pollinator biodiversity, such as the identification of likely interacting plant-pollinator pairs and the number of pollinating species.

Effects of three different flower field types on pollinator diversity and plant-pollinator interactions

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Do pollinators like hoverflies and wild bees benefit from current agri-environment schemes (annual, perennial and alternating flower fields) in Lower Saxony, Germany?

Via sweep-netting on two transects per field, we assessed species richness, abundance, and flower visitation rates of solitary bees, bumble bees, and hoverflies in annual flower fields, perennial flower fields, alternating flower fields and conventional wheat fields.

Compared to wheat fields, the abundance of solitary bees was higher in all flower field types. Bumble bees were most abundant in annual flower fields due to high floral resource availability, whereas hoverflies were equally abundant in all field types. All taxa benefitted from higher cover of flowering plants on a local level. We will further analyze the effects of the surrounding landscape, i.e. the cover of semi-natural habitats and arable fields.

Alternating flower fields are a new measure (since 2015) and their effectiveness for pollinators has not been studied in detail so far. They might be more effective than annual flower fields because they combine a flower-rich annual and a more undisturbed biannual part.

Role of landscape composition and management in shaping true bug communities of Serbian saline grasslands

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The study aims to investigate how different management types and landscape composition on small-scale determine species richness and abundance of true bugs of Pannonian saline grasslands in Serbia. Saline grasslands in this area are characterized by their patchy distribution in a mostly agricultural landscape. Traditionally grasslands of the Pannonian region were grazed by cattles and sheep, but nowadays many pastures are abandoned or seasonally mown.

Habitat heterogeneity was calculated by the Shannon diversity index in buffer zones of 500 m and 1,000 m around sampling points. Generalized linear models were used to identify the influence of landscape features and certain management types to species richness and abundance of true bugs.

All studied sampling sites were qualified as heterogeneous. Species richness was highly influenced by cutting as a management method on both scales, buffer zones of 500 m and 1,000 m, while grazing was a significant factor to species richness only inside of 500 m buffer zone. Species richness and abundance respectively were defined by percentage share of arable land inside of a 1,000 m buffer zone, but not on a smaller scale.

Considering how strong is the influence of management to species richness of local true bug communities, as our modest study

emphasizes, we should be careful with the intensity of management applied to restricted areas of saline grasslands. This is very important in conservation planning if we want to preserve as much as possible of local biodiversity.

Agri-environment schemes support different aspects of biological pest control

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Agricultural intensification has led to a dramatic loss of species and associated ecosystem services over the past centuries. Agri-environment schemes (AES) have been developed to react to the challenges caused by agricultural intensification and to promote biodiversity. In this study we tested AES strategies are more effective in controlling crop pests via natural enemies.

We selected 10 agricultural landscapes (in Southern Lower Saxony, Germany) that contained three winter wheat along a field size gradient and represented the fallowing treatments: conventional field (control), conventional field with adjacent flower strip (land sparing) and organic field (land sharing). We used two transects per field (edge and interior) where we sampled crop pests such us cereal leaf beetles (CLB) and cereal aphids as well as their natural enemies.

Our results indicate that biological control of organic farming was better than conventional farming. Flower strips which semi natural habitat protected several pests and predators too. They also increased parasitism rates of aphids, potentially outweighing this previous negative effect. In addition, we detected interaction of natural enemies

and small mean field sizes. Decreasing landscape heterogeneity, i.e. larger field size supported less natural enemy.

Since biocontrol is a key ecosystem service in sustainable agriculture, the conservation of such species has to be extended. AES strategies conventional field with adjacent flower strip and organic field combination are more effective in controlling crop pests via natural enemies. However, it is important to take into account configuration heterogeneity.

Farmland bird activity and arthropod biomass in three differently managed types of flower fields in Southern Lower Saxony, Germany

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The European Farmland Bird Index shows that the combined populations of 39 farmland bird species have halved between 1980 and 2016. Important habitat structures for nesting and foraging have been lost due to widespread landscape homogenization. Flower fields as a measure of agri-environmental schemes might support farmland birds by providing nesting and foraging habitats.

I assessed farmland bird activity density and species richness as well as arthropod biomass on three types of flower fields (annual, perennial and alternating) and winter cereal fields in Southern Lower Saxony, Germany. Alternating flower fields, which comprise of an annual and a perennial section, are a relatively new measure and have not yet been studied in detail.

Species richness and activity density of farmland birds were significantly higher in alternating flower fields compared to other field types. Activity density also increased significantly with increasing arthropod biomass in sample fields.

This study underlines the importance of the availability of arthropod prey as well as habitat structure in influencing habitat selection of farmland birds during the breeding season. A continued inclusion of alternating flower fields into agri-environment schemes is

recommended as the measure combines the strengths of annual and perennial flower fields.

Does personality of juveniles influence migration decision in White storks (*Ciconia ciconia*)?

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Landfills, which acts as continuous food resources for migration of white storks also influencing behavior and migration pattern. Closure of landfills will have drastic impact on white stork populations.

I analysed 109 tagged (GSM/GPS, together with three-axial acceleration) juvenile storks from 2016, 2017 & 2018. Calculated home range(Kernel), daily displacement, speed, proportions of fixes on landfills and when flying. I also did modelling (GLMM) to get most parsimonious model for personality in decision making.

I found that birds that had nests near landfill sites were more active (boldness) and leave their nests earlier and cross Gibraltar to migrate sub-Saharan Africa. Field observation data in 2019 also validated the results of analysis that has been undertaken from previously tagged storks near landfill sites and far from landfill sites.

The study also suggested that landfill sites are important for stork's survival. As the EU directive (1993/31/EC) is targeting to reduce open landfill activity, starting in 2016, will reduce the availability of such municipal waste. It is inevitable that in future there will be scarcity of

this kind of food waste, that will have profound impact on migratory decision of the Iberian White storks.

The effect of landscape structure on nest site selection and breeding success in three farmland predator bird species

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Populations of farmland birds in Europe declined markedly during the last decades, representing a severe threat to biodiversity. Land use change and agricultural intensification have been suggested as major factors for these declines. We evaluated whether ecosystem restoration and conservation management can counter these processes in the European Roller, Red-footed Falcon and Common Kestrel breeding in a quasi-experimental open landscape of restored and natural grasslands and wetlands.

Data collected over five years from nest boxes in a quasi-experimental open landscape. We evaluated whether habitat selection and breeding success are affected by landscape structure, land use factors or spatial scale. Around each nests we draw a buffer zone, where we measured the proportion of habitats. We used PCA analysis for the habitat description and we used them as fix factors in the GLM models. We had 5 independent factors describing the nest site selection and the reproductive success.

Nest site selection was positively related to the proportion of natural habitats and negatively to the proportion of artificial habitats in each species. The diversity of habitat types was positively correlated with nest site selection and hatching success in the Roller, whereas nest site selection of Red-footed Falcons was positively related to the proportion

of larger, conterminous habitats. Hatching success in the Roller was negatively related to the restored habitats and arable lands.

Our findings show that nest site selection in three species (the European Roller, Red-footed Falcon and the Common Kestrel) and hatching success in one species (European Roller) are related to landscape structure in farmland predators, which needs to be considered in ecosystem restoration and conservation management. Our research can help for conservation action plans especially for the countries where these species extinct or become endangered.

Lead away - uncovering regional drivers of English and Welsh Mute Swan population change, *Cygnus olor*

Tiffany L. T. Ki

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University of East Anglia (UK)/ Visiting Student at University of Cambridge (UK)

The English and Welsh population of mute swans increased significantly since the 1980s. Prior to 2019, this was attributed to the effectiveness of the 1987 lead angling weight ban based on anecdotal evidence. Wood et al. (2019) conducted national-level analyses to evaluate quantitatively its effectiveness and attributed the increase to the ban. However, our analyses revealed that this ban cannot explain the variation in population change observed at the regional level.

Using datasets from BTO surveys, we quantified both the regional change in mute swan abundance and demographic parameters, as seasonal changes in abundance likely reflect productivity and survival. Regional-scale metrics of potential food resources, water quality and weather conditions were also calculated. The regions were based on the 26 Environmental Agency regions in 2000/1. The regional values were used to test for the relationship between possible drivers of change and the observed change.

At the regional level, there is little evidence of population change being driven by the regulation in lead angling weights, suggesting that toxic effects of lead may have constrained swan populations at the national level. However, our findings so far suggest that the population growth

was driven by other factors, such as the growth of land used for arable crops.

Our results provide a robust evaluation of the drivers behind the population increase seen in the English and Welsh mute swans. It also expands the paucity of evidence quantifying the effectiveness of the lead angling weight ban in reducing exposure and decline of bird species. In addition, our investigation of change in demographic parameters allows us to understand the drivers of population growth in this water bird, which can be more widely applied to conservation action on other species.

Understanding patterns and dynamics of Herders-Snow leopard conflict for piloting non-lethal mitigation measures in Dhorpatan Hunting Reserve, Nepal

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The project will assess the herder-snow leopard conflict and its underlying causes so that low cost and predator-friendly mitigation measures can be strategically applied to reduce conflicts and promote coexistence in Dhorpatan Hunting Reserve (DHR). also it will help to map and prioritize the livestock depredation hotspots in the area for targeting nonlethal and predator-friendly devices like foxlights, safe corrals and conservation education in schools.

Literature reviews, inception workshop and mainly interviews survey were done. Interview surveys were conducted using semi-structured questionnaires with 220 household owners and local herders in the study site by Feb, 2019. The interviews were taken with household leader and herder wherever possible.

Estimated financial loss associated with snow leopard depredation in the two-year period (2016-2018) totalled $91,846 for an average of $417 per affected household. The highest financial burden was associated with the loss of Horse ($47,350) followed by goat/sheep ($31,300), cattle ($13,196).

It will contribute in conservation planning and promoting co-existence between local herders and predators in and around DHR.

Climatic exposure of strict forest reserves: What impact will be expected by the end of 21th century?

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Our hypothesis is that the effect of climate change will be demonstrated on the population and forest structural changes studied in the core areas of strict forest reserves, becouse this forest stands has developed with no human interventions for decades.

Our target areas are selected strict forest reserves of Hungary, where standard field survey were completed about ten years ago in the Permanent Sampling Points (PSP) of the Stand Dynamic and Ecological Observation Network. In order to get an insight into the degree and spatial pattern of prospective climate changes (the climatic exposure), the FORESEE (1951-2100) gridded database of observed and projected daily meteorology

The prognosed and downscaled climate exposure calculations show that by the end of the 21st century, the microclimate of all sites will have increase and become much more severe. The Forest Aridity Index (FAI) as an useful climate indicator of forest zones will go over the value of 7.25 which indicates the development of an almost unbelieveable forest-steppe climate here by the end of the 21th century.

The changes of the forest dynamic processes will be analysed by comparative analysis of re-survey and former field survey data according to the standard sampling protocols of stand structure. The re-survey and comparative assessment will be accomplished in the main

zonal forest types of Hungary then we are looking for evidences of climate change impacts on forest stand and population changes.

Comparison of replantation methods of *Posidonia oceanica* storm fragments in the Aegean Sea, with the use of biodegradable materials

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The endemic *Posidonia oceanica* is an important ecosystem architect within the Mediterranean. This slow growing species is highly susceptible to physical damage such as anchor damage. This method suggests strong evidence for the use of storm fragments to replant *P. oceanica*, without the use of donor fragments otherwise used in these restoration strategies.

Posidonia oceanica storm fragments were collected during the autumn after storms. In spring the fragments were experimentally replanted using 2 methods into a seagrass meadow off Lipsi Island, Greece. The replanted sites were monitored 15 months later by scuba diving to determine fragment survival by replant method and growth form.
A total number of 96 *Posidonia oceanica* fragments were replanted at 4.5m depth. Fragments replanted by reed anchorage showed a 75% survival rate, compared to coconut fibre pot anchorage 66%. Reed anchorage had greater plagiotrophic fragment survival 89%, while coconut fibre pot anchorage had greater orthotrophic fragment survival 83%.

This suggests strong evidence for use of storm fragments in replanting strategies, which avoids the practice of donor seagrass beds. It demonstrates that storm fragments planted by biodegradable anchorage methods within seagrass beds, such as areas of anchor damage, could be restored effectively with environmentally friendly materials.