Mammal Society Autumn Symposium

Urbanisation & biodiversity: can cities be made sustainable for wildlife?

Wednesday 9th October 2019

Arup Offices, Fitzroy Street, London
Introduction

The UK population has risen steadily over the last century, and is predicted to reach 70 million by 2029. Following global trends, there is also a gradual shift of the population from rural to urban centres. On the one hand, this provides opportunities to focus development within restricted zones, ‘sparing’ the wider countryside. But on the other hand, this centralisation of human populations necessitates a network of major transport, energy, water and other infrastructures, to meet demands for food, goods and human movement: an additional 1500 miles of road were constructed between 2006 and 2017.

Urbanisation has direct consequences for wildlife (usually negative) in terms of habitat loss and also acts to fragment landscapes creating barriers between more natural areas. There are also many overlooked indirect effects, stemming from light pollution, sound pollution, air quality issues, and human disturbance. Critically, these changes are generally irreversible, unlike transitions between most other forms of land use. Nevertheless, most urban environments are not covered with built structures — buildings, roads, car parks etc. — but are instead gardens, verges, parks and cemeteries. The exact amounts are unknown, owing to a lack of suitable surveys, but detailed analysis of British urban centres (Bristol, Edinburgh, Reading and Leeds) show that over 60% of the total land-cover is ‘green’ — with residential gardens making up 24-36% of each city. The value of this greenspace for biodiversity is therefore worthy of consideration.

Urbanisation encompasses a spectrum of scenarios, ranging from extensive sprawl — where built land is interspersed with natural environments — to intensively urbanised scenarios where compact built environments are separated from large areas of contiguous greenspace. For the most effective provision of ecosystem services such as flood control, temperature regulation, and regulation of air quality, intensive urbanisation coupled with extensive green infrastructure is the optimal solution (Stott et al. 2016). However, this may not necessarily always align with social and psychological needs of people to have ready access to small natural areas such as gardens and city parks. The relative value of this ‘land-sharing’ compared with
‘land-sparing’ within urban environments to biodiversity, as opposed to wider ecosystem services, has not been well-studied. Some towns and cities are embracing the concept of ‘green-infrastructure’, the idea being that corridors of greenspace provide ecosystem services (such as waste water filtration and flood control), improve human health, and act as refuges for wildlife. But is it possible to deliver all of these benefits simultaneously? From the perspective of wildlife, are most ‘green spaces’ just that, rather than valuable habitat? And is it only the common and widespread species tolerant of human disturbance that can make use of these places? What happens when we start to feed wildlife in our back gardens? Is it a way of supporting nature, and an opportunity for rare and precious interactions between people and wildlife; or is it a route to skewing interactions between competing species?

Today’s symposium brings together the latest research and practical examples, to assess ‘How can we make cities sustainable for wildlife’. To join in the conversation, please use twitter hashtag #MSAS19.

Once again, we would like to extend our thanks to Arup for generously providing such a great venue for our annual Autumn Symposium.

Enjoy the day!

Fiona Mathews
Chair of the Mammal Society
Programme

09.30 – 10.00  Registration and coffee
10.00 – 10.15  Zeb Soanes - Introduction from the Patron of the Mammal Society

Urbanisation – a Free Lunch for Wildlife?
Chaired by: Prof Fiona Mathews, University of Sussex and Chair of Mammal Society

10.15 – 10.40  Dr Bryony Tolhurst, University of Brighton
Adaptations of foxes to urban living

10.40 – 11.05  Dr Patrick Wright, University of Sussex
Suburbia: hedgehog haven or death-trap?

11.05 – 11.30  Tea, coffee and biscuits

What are the threats from urbanisation and how can they be mitigated?
Chaired by: Livvy Cropper, Ecologist, Arup

11.30 – 11.55  Prof Fiona Mathews, University of Sussex
Light and sound pollution: overlooked threats to wildlife?

11.55 – 12.20  Hannah Bilston, WSP
The opportunities and challenges for incorporating biodiversity benefits into new residential developments

12.20 – 12.45  Lydia Collas, University of Cambridge
Urban development, land sharing and land sparing: the importance of considering restoration

12.45 – 13.45  Buffet lunch with a selection of sandwiches and salads, savoury tarts, choice of cakes and a fresh fruit platter
Strategic Planning for Biodiversity
Chaired by: Tom Gray, Senior Ecological Consultant, Arup

13.45 – 14.10  Herman Limpens, Dutch Mammal Society
Conservation of bats in an urban landscape – an ecological or organisational challenge?

14.10 – 14.35  Domhnall Finch, University of Sussex
Incorporating animal movement, as well as habitat suitability, into strategic planning

14.35 – 15.00  Rob Cameron, Natural England
Reforming the protected licensing system to make it work better for conservation

15.00 – 15.30  Tea, coffee and biscuits

Maximising the value of greenspace for wildlife and people
Chaired by: Dr Graham Smith, Lead Scientist, National Wildlife Management Centre

15.30 – 15.55  Dr Mark Goddard, Northumbria University
The value of urban green spaces for pollinator conservation: Insights from the Urban Pollinators Project

15.55 – 16.20  Jess Kennedy, Associate Director, Arup
Greening London

16.20 – 16.45  Dr Martin Dallimer, University of Leeds
Biodiversity and human health in sustainable cities

16.45  Thanks and close
Mammal Photographer of the Year 2020

Do you have a passion for mammals and a love of photography? Could you be our next Mammal Photographer of the year?

Our 2020 competition for amateur wildlife photographers opens for entries on 24 October 2019, with top prizes available and special categories for young photographers to showcase their talents, all amateur wildlife photographers are welcome to enter.

Entry is free and the competition is open until 1 Feb 2020. Keep an eye on our website www.mammal.org.uk/mpoy/ and on social media #MPOY2020.

University Mammal Challenge (UMAC) 2020

The University Mammal Challenge (UMAC) will be running for the fourth consecutive year from 1st January to 30th June 2020. UMAC sees teams of students using a variety of survey techniques to record as many mammals as possible on their campuses in a bid to be crowned the winners! All students, from undergraduates to PhD students, are welcome to form a team and take part. For full details and registration go to: https://www.mammal.org.uk/umac/
Abstracts

Adaptations of foxes to urban living

Dr Bryony Tolhurst: School of Pharmacy and Biomolecular Sciences, University of Brighton, Huxley Building, Lewes Road, Brighton BN2 4GJ, United Kingdom
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Globally urban areas are increasing to support human populations but urbanisation impacts biodiversity and only select species can thrive in the new urban landscapes. The red fox is one of a handful of mammals that has managed to adapt to urbanisation and become one of the successful city dwellers alongside us. In this talk Dawn will explain the research they have been doing to explore how foxes have adapted to urban living and their relationship with humans in urban environments.

Suburbia: hedgehog haven or death-trap?

Dr Patrick Wright: School of Life Sciences, University of Sussex, Sussex House, Falmer, Brighton, BN1 9RH, United Kingdom
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Vehicle road collisions are likely to be an important contributory factor in the decline of the European hedgehog (Erinaceus europaeus) in Britain. Here, a collaborative roadkill dataset collected from citizen science projects across Britain was used to assess when, where and why hedgehog roadkill are more likely to occur. Seasonal trends were assessed using a Generalized Additive Model (GAM). There were low numbers of casualties in winter — the hibernation season for hedgehogs — with a gradual increase from February that reached a peak in July before declining thereafter. A multi-level hierarchical Habitat Suitability Modelling (HSM) framework was then used to identify areas showing a high probability of hedgehog roadkill throughout the entire British road network (~ 400,000 km) based on environmental determinants. Using hedgehog roadkill presence data and landscape variables, the HSM predicted that grassland and urban habitat coverage were important in predicting the probability of roadkill at a national scale. Roadkill probabilities peaked at roughly 50% urban cover and increased linearly with grassland cover (improved and rough grassland). Areas predicted to experience high probabilities of hedgehog roadkill occurrence were therefore in urban and suburban environments, i.e. where a mix of urban and grassland habitats occur. These areas covered 9% of the total area within the national British road network. Used alongside evidence on the persistence with which hedgehog roadkill are recorded in a given location over time, the HSM framework can help to identify priority areas for mitigation measures.
Light and sound pollution: overlooked threats to wildlife?

Prof Fiona Mathews: School of Life Sciences, University of Sussex, Sussex House, Falmer, Brighton, BN1 9RH, United Kingdom
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Over the last hundred years, our sensory experience of the night has changed beyond recognition. A series of technological revolutions — most recently the invention of LEDs — have made artificial lighting cheap and all-pervasive. The amount of light in the night sky is increasing by about 2% annually. Much of this is derived from street-lighting, but architectural trends for large glazed windows also play a role. Soundscapes are also changing rapidly, reflecting increases in the amount of traffic. These impacts are felt not only within urban centres, but also extend along transport routes and into the wider landscape. Yet, the ecological impacts of light and sound pollution are only beginning to be recognised. In this talk, I will discuss recent research findings, and consider some of the potential mitigation options available.

The opportunities and challenges for incorporating biodiversity benefits into new residential developments

Hannah Bilston: WSP, 62-64 Hills Road, Cambridge, CB2 1LA, United Kingdom
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New residential development presents excellent opportunities for incorporating measures for biodiversity within and around the development area. Some developments maximise benefits for wildlife while others can feel like concrete jungles which do not provide for wildlife or provide residents with healthy places to live. This Think Piece will report on the results from semi-structured interviews with a range of stakeholders including developers, planners, landscape architects, ecologists and wildlife charities. Discussions regarding the constraints and barriers for incorporating biodiversity within the design of new residential developments will be presented. It will explore the opportunities and delivery pathways for ensuring wildlife is considered in all new residential developments. Good and bad examples for onsite initiatives across the UK will be used to illustrate the challenges and possibilities often faced through the design and planning process.
Urban development, land sharing and land sparing: the importance of considering restoration

Lydia Collas, Rhys Green, Alex Ross, Josie Wastell and Andrew Balmford: Department of Zoology, Downing Street, Cambridge CB2 3EJ, United Kingdom
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Urban development – the fastest growing land use – is a major threat to biodiversity. At present, there is limited knowledge of whether populations of wild species would be greater under low-density housing (with larger gardens; land sharing), or high-density housing (allowing more area to be left as undeveloped green spaces; land sparing). We applied the sharing/sparing framework – originally developed in the context of farming – to address this question. We found that, at present, most native and non-native tree species would do best under land-sharing development, since tree densities are higher in areas of low-human density, compared to both higher-density areas and green space. However, restoring woodland in green spaces would lead to far greater densities of native trees than on any existing land use. Indeed, land-sparing development becomes the optimal strategy after just 2% of current green space is restored to woodland. Likewise, carbon sequestration is maximized under land sparing coupled with restoration, though at best 2.5% of the city's annual greenhouse gas emissions could be offset.

Conservation of bats in an urban landscape – an ecological or organisational challenge?

Herman Limpens: Dutch Mammal Society
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In the urban landscape, bats roost in built structures, as well as in trees. Green and blue structures provide hunting habitat and flightpaths. A bat colony uses a network of habitats, its roosting habitat itself being a network of roosts with different functional requirements.

Planning and development involves licencing based on accurate surveys of the functional network of bat habitats. Often mitigation of roosts (and other habitat) is a requirement.

In highly dynamic urban landscapes, working project by project is often relatively ineffective. Therefore, in the Netherlands, pilot projects are developing Species Management Plans at a municipality-wide scale. These involve identifying bat habitat networks across the municipality and planning large scale mitigation of fatality risk and damage to or loss of roosts, as well as proactive inclusion of bat roost habitat in newly built constructions.
Specific functional requirements of bat roosts are only partly known. Creation of such functional environments in buildings draws on expertise of structural physicists, architects, developers and housing estate agencies as well as bat specialists. These people come together at workshops to design and incorporate customized and prefab roosts and to share expertise. Workshops also assist in ensuring that roosts are included in the course of the development and in finding synergies among often differing interests of stakeholders.

**Incorporating animal movement, as well as habitat suitability, into strategic planning**

Domhnall Finch: School of Life Sciences, University of Sussex, Sussex House, Falmer, Brighton, BN1 9RH, United Kingdom
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The importance of habitat connectivity for wildlife is widely recognised. The rapid increase in urbanisation and infrastructure projects can cause fragmentation at a landscape scale. Yet, such developments are rarely considered in the wider context of strategic planning for both humans and nature. Here we use bats as focal species to examine how different landscape features, e.g. lights, roads and other linear features, can act as barriers to species movement or make the environment more permeable for them at a landscape scale. We highlight how knowledge of species habitat suitability can inform predictive connectivity models, which can allow for visual input into strategic planning both at a local and a landscape scale. Thus, allowing for cumulative impacts of an individual development to be assessed at a much wider scale and for appropriate species conservation plans to be designed.

**Reforming the protected licensing system to make it work better for conservation**

Rob Cameron: Natural England, 17 Smith Square, Westminster, London SW1P 3JJ, United Kingdom
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England’s most well-known example of strict protection of species is the great crested newt. In recent decades law, policy and lack of evidence have resulted in protective measures for this species being focussed on action to safeguard specimens, whilst the conservation status of this species is determined largely by the quality and connectivity of its habitat. This presentation describes the limitations in effectiveness of strict protection and identifies the policy, economic and ecological factors which have allowed a new strategic approach to be put in place for this species. It then
considers how these same factors apply to bats in England and puts forward early thinking on a new strategic approach to regulation for bats, based on evidence provided by the Norfolk Bat Survey.

The value of urban green spaces for pollinator conservation: Insights from the Urban Pollinators Project

Dr Mark Goddard: Department of Geography and Environmental Sciences, Northumbria University, Sutherland Building, Newcastle-upon-Tyne, NE1 8ST, United Kingdom
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There has been much concern about the decline of bees and other pollinators in recent years. The Urban Pollinators Project was set up to explore the importance of urban habitats for pollinators and asked three main research questions: (i) How does pollinator biodiversity in towns and cities compare to that of nature reserves and farmland? (ii) Where are the hot-spots of pollinator biodiversity in cities? (iii) What can we do to improve pollinator diversity and abundance in cities? In his talk Mark will discuss the results of the project and the implications for how we manage our urban green spaces to make cities more pollinator-friendly.

Greening London

Jess Kennedy: Arup, 13 Fitzroy Street, London, W1T 4BQ, United Kingdom

Recent studies have shown significant declines in people’s connections with nature, with children in urban environments in particular missing out on the numerous benefits access to nature provides. In a city like Greater London where over 47% of the area is designated as green space, these trends are alarming and may have significant health impacts for current and future generations. National Park City seeks to reverse these trends by encouraging people to access and enjoy London’s great outdoors more, and to make London greener, healthier and wilder. National Park City aims to link existing and inspire new initiatives under a banner which evokes the vision of Britain’s National Parks and is actively supported by the Mayor of London. One project which exemplifies the intended outcomes of National Park City is Wild West End, a partnership between six of central London’s largest land owners who have committed to fight the effects of urbanisation and climate change by creating accessible and multifunctional green space, whilst improving existing areas in London’s West End. With Arup as Technical Partner, the project has set a new benchmark for developers who are working towards sustainable, regenerative futures, and showcases how we can deliver functional, valuable environments within cities.
which contribute to biodiversity, health and wellbeing and climate resilience within one of London’s busiest built-up areas. During this session we shall give an overview of National Park City programme, definition, intended outcomes and Arup’s involvement in steering the initiative, and describe the Wild West End project’s impressive achievements to data and goals for the future.

**Biodiversity and human health in sustainable cities**

Dr Martin Dallimer: School of Earth and Environment, University of Leeds, Leeds LS2 9JT, United Kingdom

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Many of the global health challenges we face today are linked in some way to declines in biodiversity. Indeed, healthy human communities rely on functioning, biodiverse ecosystems to provide clean air, fresh water, food, and places to exercise and relax. For people living in cities, there is growing evidence that living in neighbourhoods with greater coverage of, and access to, green and blue spaces has a positive effect on physical and mental health. However, there remains little consensus regarding the particular aspects of ecosystems that deliver the greatest health benefits for the widest range of people, or indeed how important the biological diversity of urban green and blue spaces is at all. This presentation will explore what roles biodiversity, green space and the natural environment can play in ensuring cities are healthy, liveable and sustainable as global urbanisation rates continue apace.
Our training courses are for everyone, from interested individuals, to conservationists and ecological consultants. From species introduction courses, to practical field-craft weekends, mammal identification and survey techniques, we focus on ecology & biology, law, technical skills, handling & surveying. We can also arrange bespoke courses for groups. For full programme, see Mammal Society Training Courses.

“Thank you to Merryl Gelling & Mammal Society Training Courses for providing a highly informative & engaging course on water vole ecology, mitigation & live-capture techniques. It comes highly recommended!”.

Water Vole Ecology, Mitigation and Live-capture techniques for Practitioners, Oxfordshire 2019

“Had a fantastic time learning all about British Mammals this weekend. Big thanks to Debbie Alston for a comprehensive course and valuable experience”.

Mammal Identification Weekend, FSC Malham Tarn 2019

“Thank you so much to the Mammal Society for the camera trap course at RSPB Loch Leven yesterday. Learnt lots and inspired me to start using my camera more especially in my own garden. Always a pleasure to spend time at this great place too.”

Camera Trapping for Mammals, RSPB Loch Leven 2019
Join us as we celebrate our 66th Spring Conference

Friday 27 March 2020 – Sunday 29 March 2020

at Robinson College, Cambridge

This year’s Cranbrook Lecture will be given by

Prof Andrew Balmford, University of Cambridge.

The annual Mammal Society Award will be presented during the conference dinner.

Tickets for the dinner, as well as conference tickets, will be on sale shortly on our website.

For those wishing to submit an abstract, the deadline is Sunday 8 December. Submission details available soon on the website.