Monday

16:00-18:00

Conservation Action for Threatened Insects

Room 103b

Moderators and Organizers: Axel Hochkirch, Trier University, Department of Biogeography

16:00 **0393** The IUCN conservation cycle applied to insects. **Axel Hochkirch**, Trier University, Department of Biogeography-Chair of the IUCN SSC Grasshopper Specialist Group, Germany

16:15 **0394** Compiling and summarising the evidence for effective conservation action for threatened insects. **Andrew Bladon**[1], Rebecca Smith[1] and William Sutherland, [1]Conservation Evidence Department of Zoology University of Cambridge, United Kingdom

16:45 **0395** Strategic nomination of insects and allied invertebrates for conservation management in Australia. **Gary Taylor**, The University of Adelaide, Australia

17:15 **0396** Sow Wild! Citizen scientists find sown mini-meadows increase pollinator diversity in gardens. **Janine Griffiths-Lee**[1], Dave Goulson and Elizabeth Nicholls, [1]University of Sussex

17:30 **0397** Can green roofs compensate for the loss of (Hymenopteran) biodiversity in cities? **Jeffrey Jacobs**, University Hasselt

Available Abstracts from the Symposium ”Conservation Action for Threatened Insects” [from the ICE2022 Book of Abstracts]

Compiling and summarising the evidence for effective conservation action for butterflies & moths

Authors: Bladon Andrew[1], Sutherland William[2] and Smith Rebecca[1], [1]Conservation Evidence Department of Zoology University of Cambridge, United Kingdom, [2]University of Cambridge

Abstract: Lepidoptera (butterflies and moths) are the second most speciose group on the planet, and play a vital role in many terrestrial ecosystems as pollinators and primary consumers. Butterflies in particular are probably the most popular and well-known group of insects, and in an era of increasing concern about global declines in insect abundance, much of the best evidence comes from butterflies and moths. Despite facing a wide-range of threats, from habitat loss and conversion, to pollution and climate change, only around 1,500 species of Lepidoptera (of ~180,000 described) have been assessed for the IUCN Red List, the majority of which are butterflies. From these assessments, around 30% of species are thought to be in decline, and 5-10% are threatened with extinction. Conservation management is required to reverse these declining population trends, and to recover species that have suffered local extinctions.

Evidence-based knowledge is key for planning successful conservation strategies and for the cost-effective allocation of scarce conservation resources. Targeted reviews may be carried out to collate evidence on the effects of a particular conservation action, but this approach is labour-intensive, expensive and ill-suited for areas where the data are scarce and patchy. The evidence for the effectiveness of conservation actions aimed at insects is scarcer than for vertebrate taxa, and accordingly, only a small number of targeted reviews on butterflies and moths exist. Assembling the existing evidence for butterfly and moth conservation actions in one place, alongside information for other taxa, facilitates easy-access for both conservation scientists and conservation practitioners.

We used a subject-wide evidence synthesis approach to simultaneously summarise the evidence for all actions dedicated to the conservation of butterflies and moths. By simultaneously targeting the entire range of potential actions, we were able to review the evidence for each action cost-effectively. The resulting synopsis can be updated periodically and efficiently to incorporate new research. I will present the theory behind the Conservation Evidence approach, and discuss the findings from our recently published synopsis. The synopsis will be freely available online and, alongside the Conservation Evidence online database, will be a valuable asset to the toolkit of practitioners and policy makers seeking sound information to support butterfly and moth conservation.

Strategic nomination of insects and allied invertebrates for conservation management in Australia

Authors: Taylor Gary, The University of Adelaide, Australia

Abstract: Insects and allied invertebrates are the most numerous and diverse organisms in terrestrial and freshwater environments. They play critical roles in ecosystem function including pollination, herbivory, nutrient cycling, parasitism and predation, and providing food for most invertebrates and vertebrates. The Australian fauna is highly endemic, with numerous ancient lineages, relicts and evolutionary radiations. Yet, under increasing environmental stress, they may be disappearing rapidly, undocumented, in the face of key threatening processes such as habitat loss and fragmentation, exotic and invasive species, pollution and climate change. As impediments to conservation, terrestrial invertebrates are impacted by the Public dilemma (too small, too hidden and too little known), the Political dilemma (too little attention from decision-makers), the Scientific dilemma (too few scientists and scarce funding), the Linnean shortfall (many undescribed species), the Wallacean shortfall (too little known about distribution), and the Prestonian shortfall (too little known about abundance). Of the 285 species of insects and allied invertebrates listed under the Australian State/ Territory Acts, the national EPBC Act and the international IUCN Red List shows a highly biased (mis)representation across the Australian landscape. Of the 89 Australian IBRA regions, six had more than 18 species, 23 had less than five species and thirty-six (40%) had no species at all. For a more uniform representation, the AESCC proposes a novel regional approach by selecting a relatively small number (3-5) ‘flagship taxa’ from each IBRA region to engage scientists, government agencies, local community groups and the general public in conservation management. The nomination of iconic flagship species that may include threatened species at risk of extinction, or species of important scientific, social or cultural value from under-represented IBRA regions is currently being advanced to better represent insects and allied invertebrates across the Australian landscape. Nominations will be progressively posted on the AES website at www.austentsoc.org.au.

Sow Wild! Citizen scientists find sown mini-meadows increase pollinator diversity in gardens

Authors: Griffiths-Lee Janine[1], Goulson Dave[1], Nicholls Elizabeth[1], [1]University of Sussex

Abstract: With increasing urbanisation there is growing potential to support insect populations in urban landscapes. Using citizen science, we investigated the effectiveness of a small 4m² mini-meadow in recruiting beneficial insects in UK gardens and allotments. Participants were allocated one of three treatment groups: Seed mix 1 (commercially available 'meadow mix'); Seed mix 2 (formulated based on pollinator foraging preferences); or Control (no additional wildflower mixes). All participants conducted insect sampling over two years using standardised pan and sticky trap methods May-August. Samples were returned for identification by trained specialists. Mini-meadows provided resource-rich habitats, increasing wild bee richness and supporting on average 111% more bumblebees, 87% more solitary bees and 85% more solitary wasps in the year following seed-sowing, compared to Control. The wildflower mixes were also taxon-specific in their attractiveness, probably due to key plant species in the mix. We used citizen science as a novel and pragmatic approach to access private gardens to survey insects. Participant retention was good, and citizen scientists made an invaluable contribution. Domestic gardens and allotments provide huge potential habitat for pollinators. Small-scale floral enhancements can attract more beneficial insects in fragmented urban landscapes, supporting urban biodiversity, pollination services and biological control.

Can green roofs compensate for the loss of (Hymenopteran) biodiversity in cities?

Authors: Jacobs Jeffrey, University Hasselt, Belgium

Abstract: In an urbanizing world, the roles and benefits of urban green space cannot be denied. The aim of our study is to check if green roofs can compensate, for this loss of biodiversity in cities. However, research on Hymenoptera and more specifically on pollinator communities and what is driving their species richness and community composition on green roofs is limited.

We have sampled invertebrate communities on eighteen extensive green roofs over a half year period from march until September, in the city of Antwerp, Belgium. Our assumption was that the more isolated the roof was the less biodiversity we would find there, as it becomes more and more difficult for species to colonize these isolated habitats.

Our results show that we found significant more Hymenoptera per trap on the ground level sites then on the green roofs. However, we were unable to support our hypothesis that we would find significantly less biodiversity in more isolated roofs compared to roofs closer to green spaces.

We will try to understand which species traits are best for surviving on these green roofs and which green roof traits are needed to support a wide variety of invertebrates.