A systems approach reveals urban pollinator hotspots and conservation opportunities

A research paper published last month in Nature Ecology and Evolution was the result of a broad collaboration of scientists and practitioners across the UK. The project used a large-scale study of floral resources and pollinators in 360 sites in order to model city-scale effects of management interventions on plant–pollinator community robustness to species loss.

Co-author Damien Hicks, Senior Advisor in the Statistical and Modelling Service (SMS) in the Chief Scientist Directorate at Natural England, said 'By innovative modelling and sheer weight of numbers we were able to test the ecological importance of different urban habitats to pollinators, and gardens and allotments were the clear winners. The first due to their extensive area, the second due to their high pollinator diversity and plant–pollinator community robustness.'

These findings have direct applications to Defra's 25 year plan and ongoing plant and pollinator trials beyond EU exit this year, underlining the potential of SMS analyses to collaborations throughout the UK.

Photo below: *Merodon equestris*, a hoverfly pollinator of UK urban gardens.

UKDNA Working Group conference 2018 & DNA Webinars

Last year's UK DNA working group conference brought together researchers and end users to discuss recent developments in the use of DNA based applications for monitoring and detection. The conference was held at Derby University with financial support from Natural England and other agencies. It brought together over 100 people from academia, government, agencies, industry and NGOs with sessions on marine and terrestrial ecosystems, fish, ponds, macro-invertebrates and invasive species. A strong theme at the conference was how we interpret and apply these tools to provide us with ecological insights. See twitter #UKDNAWG18.

To ensure that Natural England staff is kept up to date with this fast moving technology, a series of bite-sized presentations on DNA and how Natural England is engaging with this work is underway. To date two very successful webinars, with over 100 staff on each, have been delivered. The first call gave an introduction to DNA, the second covering terrestrial invertebrates, with both explaining what Natural England is currently doing and plans for the future, including techniques that are hoped will become business as usual in the future. Further presentations on DNA and Natural England in the marine environment, fungi and GCN are lined up, with more to follow.

Work underway this year includes a comparison between traditional identification of trap caught invertebrates and identification through DNA analysis; soil sampling for fungi, eDNA sampling for crayfish distribution in a catchment and inshore fisheries communities.

Expanding the Reach of Our Agri-environment Evidence

The Agri-environment Monitoring and Evaluation (M&E) sub-team has increasingly been working to raise the visibility and impact of its M&E Programme, including:

1. European Evaluation Helpdesk for Rural Development Conference, Slovakia
This brought together Managing Authorities, evaluators and other stakeholders from over 20 Member States, to discuss evaluation approaches for assessing CAP Pillar II impact indicators, and answering associated Common Evaluation Questions. Susanna Phillips, Principal Adviser for Agri-environment Evidence in Natural England's Chief Scientist Directorate gave a presentation on assessing the impact of the Rural Development Programme in England. For more information click here.

2. Farming and Wildlife Advisory Groups (FWAG) Annual Conference
FWAG's Annual Conference was held in December and Ruth Oatway, Senior Adviser in the Chief Scientist Directorate Agri-Environment Monitoring and Evaluation team, gave a talk entitled 'What does agri-environment deliver?', sharing findings from recent M&E projects. Participants fedback that they really appreciate the evidence base to support advice they give farmers.

3. Webinars for Defra Environmental Land Management (ELMs) Teams
The M&E sub-team are delivering a series of webinars, with nearly 120 staff from across the Defra family invited. These have been well received, and focused on:
- Introduction to the M&E Programme
- Synthesis of findings from 25+ years of monitoring
- Why agri-environment M&E is especially challenging and how this is reflected in the design of the current programme

Supporting Biological Recording through online data capture

Much of the biodiversity evidence Natural England requires comes from the efforts of an army of biological recorders. As technology advances, recorders are increasingly adopting online data capture tools like iRecord, and Natural England is keen to support them in this.

Last year, Evidence Programme funding paid for a package of improvements to iRecord, designed to facilitate more use by Natural England, and to improve data flow to the National Biodiversity Network Atlas. Specifically, we developed Natural England recording forms which allow all our records to be gathered in one 'pot' and ensures they are transferred to the NBN Atlas where they are openly published for anyone to use. NE biological records can now also be grouped together according to survey codes, and can be uploaded in bulk via a spreadsheet import tool. The transfer of iRecord records to the NBN Atlas has been transformed from a manual, ad hoc process to an automated, monthly one which is available to all iRecord users, and we have supported Biological Records Centre working with some of the smaller National Recording Schemes and Societies to update the taxonomic rules which are used within iRecord to automatically check all entered records as part of the quality assurance process.

So the changes benefit not just Natural England but biological recording more widely. A recent article in Conservation Land Management describes iRecord and some of these changes in more detail.

Upland peatland monitoring

Achieving the restoration of upland peatlands is a key objective for the government. Monitoring is an essential part evaluating of natural recovery and the effects restoration management. For aspects of peatland management where the evidence-base is limited, such as burning for restoration purposes, monitoring is vital.

Upland habitat specialists in Natural England have developed a protocol with a standardised approach to peatland monitoring. The protocol provides a simple methodology so that land managers can carry out the majority of monitoring themselves. The protocol is designed to gather data which is complementary to Natural England's statutory monitoring regimes. The protocol also sets out how to collect data to validate and develop the Moorland Change Map which uses satellite imagery to improve the efficiency of monitoring in the future.

So that data can be recorded easily in the field a free mobile data collection App for has been developed for use by the Web Services and Analysis Team that can be used on smartphones to collect the variables set out in the protocol.

By using the App to collect data we hope that a joint approach to monitoring peatland interventions will increase the evidence base to inform future peatland management.

Tim Hill, Chief Scientist, 20 February 2019