Science & Evidence in Natural England

An update from the Chief Scientist Directorate (CSD) - January 2019

Adding to our agri-environment evidence base

The Agri-environment Monitoring and Evaluation Programme is continuing to deliver important findings to improve environmental outcomes by advancing our knowledge around potential improvements to scheme design and delivery. Continuing on from the launch of our annual report, here is a summary of five more recently published reports:

- **Assessing the contribution of agri-environment schemes (AES) to climate change adaptation**

This report presents the development of a monitoring protocol to improve our understanding, and enable assessment, of how AES contribute to climate change adaptation.

- **Monitoring the contribution that Environmental Stewardship (ES) is making to landscape character**

This report presents the methods and findings of research into the effectiveness of ES in conserving and enhancing farmed landscapes, using an innovative 'rapid survey' approach to gather data from 596 sampled landscapes.

- **Monitoring 'Supplementary feeding in winter for farmland birds' options within ES**

This project explored the response of farmland bird populations to ES management. The report provides good evidence that ES management has contributed to an ongoing reversal or slowing of population declines in a number of key farmland bird species.

- **Evaluating the Turtle Dove HLS Package**

During 2015, 20 agreements delivering the package were surveyed for both turtle dove and suitable habitat by the RSPB. Turtle doves were found on two-thirds of the agreements with the Turtle Dove package, and the birds showed a significant association with the extent of option HK15 (Maintenance of grassland for target features).

- **Evaluation of HLS options on lowland heathland**

This project aimed to assess the effectiveness of ES lowland heathland options in contributing to favourable condition status. The report showed that ES options led to some detectable positive changes in vegetation condition and bare ground cover.

Computer vision proof of concept

As part of a future Environmental Land Management (ELM) approach, Natural England is currently running a pilot scheme which pays farmers according to the environmental outcomes they achieve. In the East of England farmers are taking part in the pollen and nectar payments by results trial.

Defra's Data Programme have recently secured funding for proof of concept testing whether computer vision technologies can assist with the delivery of the scheme.
As part of the trial farmers record the number of species present at ten points across the area sown and take supporting photographs. Payments are based on the information submitted by the farmers. Computer vision could be useful in helping farmers identify individual species or alternatively in validating the results submitted. Natural England's Evidence Services team will be leading on the image recognition aspect of the proof of concept.

Whilst image recognition is developing rapidly, the pilot presents many technical challenges. An earlier research project by the Centre of Ecology and Hydrology used images of flower heads to train a machine learning algorithm and achieved high levels of accuracy for many species. The payment by results trial however involves photographs containing many species with flowers often obscured by other vegetation. Early indications are though that it is possible to identify a number of species present in the images. Developing Natural England's capabilities around image recognition and other machine learning technologies is also likely to have wider potential.

Image: Example Pollen and Nectar quadrat

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Earth Heritage: 50 years of sharing our expertise

Earth Heritage is a magazine produced twice yearly by the Geologists Association, Natural England, Natural Resources Wales, Scottish Natural Heritage and the Quarternary Research Association. The latest issue of Earth Heritage electronic magazine marks 50 years of sharing our evidence and expertise on geological and landscape conservation with our partners and stakeholders. Initiated in 1968, to connect conservation agency staff with external geoscientists and to establish a network of experts to provide advice on geoconservation activity, the magazine it in various incarnations chronicles 50 years of progress and change, success and failure.

With Natural England staff amongst the editors of the magazine, and having published around 50 articles in it over the last 10 years, it is an extremely important vehicle in promoting Natural England's work. The current issue, including three articles from Natural England, explores the evolution of geoconservation and the pivotal role Earth Heritage has played as a means of sharing evidence and good practice, and in connecting geoscientists, learned societies, conservation agencies, voluntary groups and the wider public. It also includes a range of articles on innovative projects to enhance, manage and promote our geoheritage.

In addition to providing a source of information for the geoconservation community in the UK and internationally, production of Earth Heritage plays a major role in in building partnerships, with the editorial board including representatives from the UK conservation agencies, two learned societies and the voluntary sector. Natural England has a reputation as a world-leader in geoconservation, partly established through sharing our expertise in Earth Heritage.

Free downloads of the current and back issues are available here.

Beetle survey of Highcliffe to Milford Cliffs SSSI

The first organised survey of the beetles of Highcliffe to Milford Cliffs Site of Special Scientific Interest (SSSI) in Dorset and Hampshire was undertaken in May 2018 as part of a wider assessment of the importance of the SSSI for invertebrates associated with soft rock cliffs (SRC). The survey, carried out by Natural England specialists and Field Unit entomologists, recorded 157 species including 27 with a conservation status.

The SSSI stretches for nine kilometres along the coast from Christchurch Bay to Milford on Sea. Primarily designated for its diverse fossil flora and fauna, the SSSI is also important for semi-natural vegetation and SRC invertebrates. It includes the largest section of soft cliff in Hampshire.

Coastal SRC is a nationally scarce habitat. With around 256 km of unprotected coastal soft cliffs, England supports the greatest area of the habitat in the UK and a significant proportion of the total area in NW Europe. This special habitat supports a great diversity and abundance of rare insects, spiders and other invertebrates, and acts as vital refuge for many declining species.

This survey is an excellent example of NE Field Unit staff and specialists working together. It confirms that the SSSI still supports some excellent SRC habitats of significant value to many scarce and localised beetle species.

Tim Hill, Chief Scientist, 23 January 2019

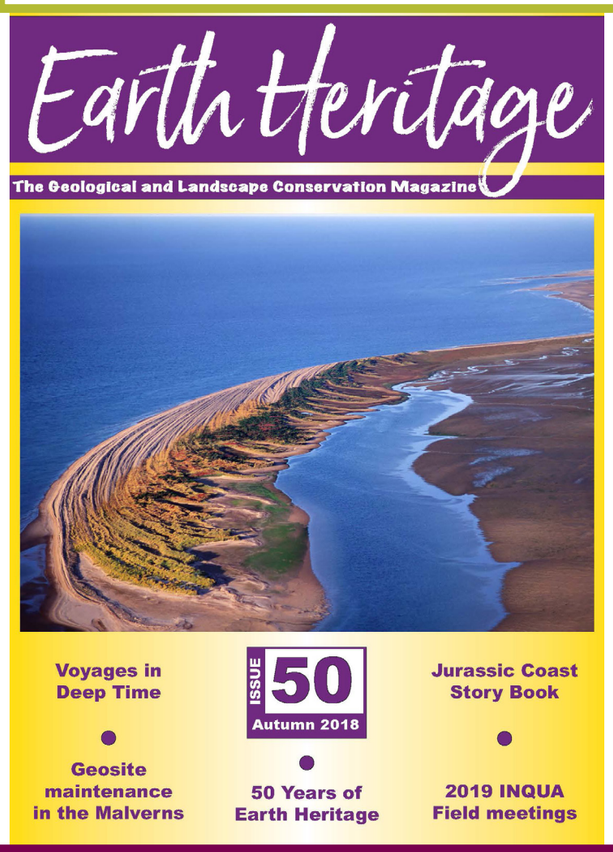

Image: Sam Scriven, Jurassic Coast Trust, explains the important marine fossils found on the Jurassic Coast, while schoolchildren bring some marine reptiles to life. Find out more about their project and other Geology news, including contributions from Natural England, in Earth Heritage 50. Photo by Sam Rose.

The Chief Scientist Directorate in Natural England consists of our national specialists and evidence staff.
For comments or queries, please contact us at CSD.Communications@naturalengland.org.uk.

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