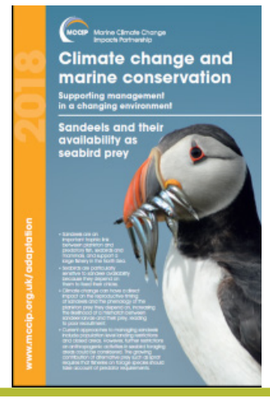
Science & Evidence in Natural England

An update from the Chief Scientist Directorate (CSD) - December 2018

Launch of Marine Climate Change Impact Report Card

The Marine Climate Change Impact Partnership (MCCIP) published a series of seven report cards explaining how some of the UK's most important marine habitats and species are being affected by climate change, and how these impacts could be managed. Natural England Specialists were amongst some of the UK's leading experts from academia and nature conservation agencies to contribute to these cards. Each card focuses on a specific protected habitat or species known to be vulnerable to climate change, such as saline lagoons, sandeels and saltmarsh.



The cards highlight the need for a holistic approach that reduces other man-made pressures to boost resilience to climate change, gives due consideration to climate change during marine planning exercises, and allows for flexible management of marine protected areas and their boundaries.

Full detailed findings from the seven cards are available at here.

DNA based methods for monitoring the environment

DNA based methods for monitoring the environment have huge potential. Natural England work in this area began with the use of environmental DNA to detect the presence of great crested newts in ponds. For the last 2 years we have been running projects looking at species detection for a range of taxa in different ecosystems (standing and flowing freshwaters, saline lagoons, coastal waters and sediments, terrestrial invertebrate traps, deadwood mould, vegetation and soils). The results from the first year of these projects have just been published. The report can accessed here.

Responding to Ash Dieback

The Derbyshire Dales NNR team have been pioneering the response to ash dieback and since November 2017 has been re-introducing these lost species to the reserve. Areas for planting were selected from stands which are expected to be at highest risk from ash dieback. These areas are then thinned, by removing young stressed trees which are already diseased, whilst leaving other species and more mature ash. This is the exciting beginning of the restoration of an ecosystem.

Parliamentary approval to charge for wildlife licences

The Statutory Instrument (SI) that allows Natural England to charge for licences passed its Parliamentary scrutiny on 12 October. Once fully implemented, this could increase Natural England's income by over £1 million per year, significantly reducing the reliance of the service on grant-in-aid.

Getting the SI through Parliament involved integrated working led by the change and reform team and with significant input from CSD's Thom Harle, Senior Specialist for Economics. At the core of this process was the need to demonstrate a positive cost-benefit case to applicants to gain support from Treasury and the Regulatory Policy Committee, whilst also showing that the proposals supported both environmental ambitions and those of other Government Departments.

In order to do so, Thom used our extensive data on licence applications, combined with external evidence on the impacts of licensing on different sectors, to estimate the benefits to applications through faster issuing of licences. He calculated what the charges for licensing should be and demonstrated that the benefits will not only outweigh the associated costs but also support the Government objectives, such as faster throughput of housing. Finally, he calculated what the regular income from the charges would be, so the licensing service can look to support more pre-application engagement and compliance checking which will improve environmental outcomes.

What could Natural England look like in the future?

What could Natural England look like in the future? Efficient Administrator, Strategic Facilitator, Expert Authority, Partnership Manager or Competitive not-for-profit?

The names above relate to five scenarios, developed over the last year, describing the plausible space we think Natural England could operate in out to 2030. Following a process of expert interviewing with NE managers, we created scenarios based on axes of outcome vs outputs; our reliance on GIA and whether our business processes support top down short-term targets or prioritised, user-driven targets. Each scenario describes how we see ourselves, how we relate to others, create value, use resources and regulation and respond to business shocks.

For each scenario we articulated the underpinning business model through 10 business attributes, for example on leadership and culture to produce a wind tunnel assessment framework. The wind tunnel can be used to test the strategic fit of NE models to see where they fit within the plausible scenario space. At an October workshop we put the emerging NE Road Map through the wind tunnel. Our analysis suggests that the Road Map most closely aligns with the facilitator and partnership scenario space - indicating we need to increase our expertise and capabilities in convening and facilitating collaboration. The analysis also suggests that if aspects of our work are in the Efficient Administrator or the Competitive not-for-profit space they are not a good strategic fit for what we want to achieve through C21 and the Road Map.

New Research Report: Natural Capital Indicators

Natural England's Natural Capital Indicators project takes a new and systematic approach to identify environmental properties vital for sustaining human well-being. This allows us to define and measure change in natural capital. Rather than being driven by the available data, we have taken a fundamental step back to identify how the quantity, quality and location of our ecosystems underpin the provision of ecosystem services, which provide benefits and value to people. The indicators have been designed to be wide reaching in their applications, of use wherever the aim is to measure change in natural capital. So far, for example, they have been used in the Office for National Statistics' national ecosystem accounts and are informing implementation of our Conservation Strategy, such as attributes of resilience. To find out more see our recently published Natural England Research Report Natural Capital Indicators: for defining and measuring change in natural capital.

Green is the new Red: Development of IUCN Green Listing

The International Union for Conservation of Nature mandated the development of Green Listing to establish the effectiveness of species recovery projects, resulting in a paper this year on Quantifying species recovery and conservation success to develop an IUCN Green List of Species. Some early exploratory work on the IUCN's new Green Listing process was undertaken with Dr Molly Grace at Oxford.

As part of this development we have been initially working with Molly and her student Joe to provide them with real world examples, using Fen raft and Ladybird spider Species Recovery project data, in conjunction with the expertise of our spider contractors. The method looks at what has happened, what is happening and what would have happened had we not intervened, and then takes three future views on status with and without further intervention, and what the ideal conservation state might look like. It graphs all of this out and calculates the percentage recovery.

It is still in development, so some war-gaming on conservation scenarios has been useful, especially around translocation and whether the method might predict how many sites are required to reach recovery. In its more mainstream application, how well are those species doing, and what degree of support remains necessary to ensure they maintain the "viability" or "functionality" as the method allows. It has possibility of formalising our species recovery actions and more fully understanding when enough is enough.

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Evaluation Work

Doing more and better evaluation is one of the strategic evidence shifts within the Chief Scientists Directorate. Evaluation is important to demonstrate accountability, facilitate learning and improve policy. Here we report two separate evaluation projects both taking place in English Uplands but at very different stages of their evaluation story. The first is the successful completion of the Upland Ecosystem Services Pilot Evaluation whilst the second reports the development of the evaluation framework for NE's Upland Programme.

Example 1: Upland Ecosystem Service Pilot Evaluation

Evaluation of pilots is essential because lessons learned are often the most important outputs. The Bassenthwaite, South Pennines and South West Upland Ecosystem Service Pilots, initiated in 2009, applied the ecosystem approach in a place. They focussed on natural capital and ecosystem services, using participatory approaches to develop shared, landscape scale and place-based plans. In addition, they explored techniques to put an economic value on ecosystem services. The learning points from these pilots are critical to our implementation of C21 and the 25 Year Environment Plan.

The evaluations considered how well the pilots achieved their stated aims and investigated the differences between them in terms of approaches, outputs, outcomes and successes and the reasons for these. The variations between the pilots enabled analysis of what worked well, what didn't, and why. One major finding highlighted the importance of existing and effective partnerships for engaging stakeholders through a participatory approach. Having a shared and not too large pilot boundary, was also found to be important. Crucially, the reports also highlight the importance of building in and planning for evaluation from the start of a project, ensuring that relevant data and records are collected.

These ground-breaking pilots were amongst the first to adopt an ecosystem approach. Their legacy has influenced national work on ecosystem services and natural capital, strengthening the evidence base as well as providing much needed practical examples. A Synthesis Report of the Evaluation of the Upland Ecosystem Service Pilots was recently published and can be accessed here.

Example 2: Uplands Programme Evaluation

The strategic significance and high profile of the Uplands Programme, in delivering the Blanket Bog Restoration Strategy and addressing the current EU infraction on rotational burning of blanket bog, is well recognised. The programme also represents the first large scale test of the Outcomes Approach, through the development of Long term Plans (LTPs) which seek to achieve a shared vision and actions to secure long term outcomes between plan partners. These features make the programme an obvious priority for robust, transparent and proportionate evaluation effort. We have used a logic model approach to develop the Uplands Evaluation Framework, repeatedly refining this through consultation with area team staff. Development of the logic model has helped us: identify key evaluation questions at each stage in programme delivery; think critically about the assumptions that underpin delivery of the programme's objectives and identify any specific risks associated with operational delivery. We presented the proposed evaluation framework to the Natural England Science Advisory Committee (NESAC) on the 17th October. NESAC endorsed the approach taken and principles proposed, flagged risks associated with the availability of monitoring data, suggested useful refinements, and agreed to provide oversight of the evaluation process and output. This helpfully ensures we're not seen to be "marking our own homework". Work is underway to progress recommended actions including finalising the botanical monitoring protocol associated with the Long Term Plans.

Studying Roseate Terns on Coquet Island

Under the Actions for Birds in England scheme, Natural England and RSPB collaborate on projects to benefit the conservation status of birds in England. Under this scheme, and with additional financial support from the EU LIFE Programme, a project investigating the metapopulation dynamics of the UK's rarest breeding seabird has just concluded. Roseate terns breed at just three main colonies in Britain and Ireland with a total population of under 2,000 pairs and only one regularly-used colony in England – Coquet Island. This colony has been managed by the RSPB for many years and numbers have increased from about 16 pairs in the 1970s to 118 pairs in 2018.

The research, led by Dr Adam Seward and Dr Mark Bolton of RSPB, with input from several others (including Dr Richard Caldow, a Senior Specialist for Ornithology in Natural England) combined data on the ringing and re-sighting of roseate terns and their breeding success at each of the three principal colonies in a population model. The modelling revealed that Ireland's Rockabill colony is the only one which is currently "exporting" roseate terns, and that for nearly 30 years the growth of the colony on Coquet Island, has been driven by immigration from Rockabill. The modelling also indicated that the metapopulation might have been 10% larger if all the birds that fledged at the Rockabill colony but recruited to Coquet Island had stayed at home to breed instead. However, the Coquet Island colony has played an important role in maintaining the species in the UK. This third colony means that the UK and Irish population as a whole is better protected against catastrophes like severe weather events, disturbance or disease that might hit the other two colonies. Nonetheless, the "sink" status of the Coquet Island colony indicates that before future attempts to encourage recolonization of former sites, assessments of site suitability should be undertaken to avoid creation of a "sink" population to the detriment of the overall metapopulation size. The findings of the study are published in the Journal of Animal Ecology.

Tim Hill, Chief Scientist, 5 December 2018

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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