



Nature News Spring 2019

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Chief Executive's Introduction

Welcome to the second issue of our re-launched JNCC Nature News – bringing you updates and information on our UK and international work. Our first edition was well-received around the world and in this issue we're pleased to report on more of our work in global nature conservation as well as some of our UK activities.

Hot off the press, I'm delighted to report that Defra have recently announced the designation of a third tranche of Marine Conservation Zones (MCZs) in English waters, comprising 41 new sites. JNCC provided scientific advice to underpin the designation of the 13 new offshore MCZs included in this tranche of sites. This is a fantastic achievement that represents the culmination of over 10 years of work by JNCC and partner organisations. It is a major milestone towards completion of an ecologically coherent network of marine protected areas in UK waters.

The UK Overseas Territories are of huge importance for global biodiversity and several of the articles showcase the evidence and advice we provide in support of their environmental priorities. For example, there's currently a communications revolution in the South Atlantic Territories that is transforming the data links between the Territories, their neighbours and the rest of the world. Taking advantage of these changes, we're working with our partners in the region to apply modern techniques, develop local skills and deliver improved outcomes for nature conservation.

And in the wider UK Overseas Territories, we report on a workshop that JNCC organised, hosted by the Government of Anguilla. The workshop brought together experts from the region to explore the threats facing coral reefs and other marine ecosystems.

Earth observation techniques are providing a continuous stream of information about the Earth's surface. With the collection of so much information it's important that we make the most of this valuable resource. In this issue we highlight the opportunities that these techniques offer, including a personal view from Gwawr Jones in our Meet the Expert feature.

We recently said farewell to our Senior Ornithologist David Stroud who was an internationally renowned expert in his field. I'd like to take this opportunity to thank him for his extraordinary contributions to nature conservation in the UK and globally over many years. And finally, congratulations to our Committee member Charles Banner on his recent appointment as Queen's Counsel.

Marcus Yeo, JNCC Chief Executive

News in Brief

NPMS relaunch

Since 2015, hundreds of skilled volunteers have recorded plants in over 3,000 survey plots of semi-natural habitat. The National Plant Monitoring Scheme, funded and run by JNCC, Botanical Society of Britain & Ireland, Centre for Ecology & Hydrology and Plantlife, had a media-drive this Spring to relaunch the scheme to sign up more volunteers and increase coverage. You can find [out more and about how to get involved](#)

MPA Progress Report

We are delighted to have partnered with Scottish Natural Heritage (SNH) and others to input into the Marine Protected Area (MPA) Progress Report - recording progress towards Scotland's commitment to an ecologically coherent MPA network.

SNH presented the last six years' progress in developing Scotland's MPA network in a report to Scottish Government. During this time we have made some great achievements towards the conservation of important features of Scotland's seas. This has included the designation of 41 new MPAs and the extension of two sites, affording protection to a wider range of Scotland's important cultural and historical artefacts, marine habitats, species, geology and landforms within the [MPA network](#).

Air Pollution Bulletin

The latest Inter-agency [Air Pollution Group](#) (IAPG) Bulletin is available online. This edition features new air quality thresholds in Wales, tackling ammonia emissions in Northern Ireland and the development of the Nitrogen Decision Framework.

The IAPG is a collaboration between JNCC and the country nature conservation bodies, who work together to provide evidence and advice on air pollution impacts on biodiversity and ecosystems.

JNCC in Nairobi

Global Environment Outlook is the United Nation's flagship assessment of the state of the world's environment; its 6th report (GEO6) was published at the UN Environment Assembly in Nairobi, on 11 to 15 March 2019. The full report, at over 700 pages, documents the challenges facing the world's environment and the risks that its degradation poses to human health and well-being.

At Defra's request, JNCC's Vin Fleming represented the UK at the negotiations, early in the year, to agree the 'Summary for Policy Makers' which synthesises, into c40 pages, the key messages of GEO6 in a form which is [accessible to decision makers](#).

Expanding the ‘blue-belt’ of Marine Protected Areas around the UK

At the end of May, the designation of a third tranche of 41 Marine Conservation Zones (MCZs) in Secretary of State waters was announced. The 41 new MCZs range from the coast of Northumberland in the North-east of England (for the protection of Eider ducks) to the deep-waters of the south-west of England to expand protection for fragile habitats such as gardens of cold-water corals.

The MCZ Project was established back in 2008 by Defra, JNCC and Natural England, to work with regional stakeholder-led projects to identify and recommend MCZs to Government. This announcement of the third tranche marks over 10 years of work across multiple organisations and stakeholders.

JNCC has played a pivotal role in collecting and collating the best available evidence and providing high-quality scientific advice to Defra on possible locations for MCZs away from the coast. This third tranche includes 13 MCZs in offshore waters; the greatest number of any of the tranches.

JNCC Chief Executive Marcus Yeo said: “This is a fantastic achievement in our collective vision for clean, healthy, safe and biologically diverse seas across the UK. As lead advisors we’re proud to see the designation of a substantial number of additional MCZs in waters away from the coast, including the deep- sea; furthering vital protection for habitats and species of national and international importance such as coral gardens, sea-pens and fan mussel. We know this is not the end of the story and look forward to continuing working with Defra and the other responsible organisations to ensure these new MCZs contribute effectively to the UK Marine Protected Area (MPA) network and deliver tangible conservation benefits.”

The newly designated areas cover 12,000km²; an area almost eight times the size of London. Taking a UK-wide snapshot, we now have 355 MPAs formally designated, and by sea area this puts the UK in the top four global leaders on MPA protection. Overall, nearly one quarter of all UK waters fall within MPAs; an area close to the size of the UK’s landmass itself. You can view UK MPAs on JNCC’s MPA mapper system.

JNCC will continue to provide quality assured advice to governments to best ensure the UK’s MPA network is well-managed and delivers conservation benefits to society.

For further information on the designations visit the Defra website. Visit the JNCC website for our advice on tranche three MCZs.

Pete Chaniotis

Meet the Expert

In this issue we focus on Dr Gwawr Jones, Senior Earth Observation Specialist. Gwawr joined JNCC in 2016 and currently works in the Ecosystem Analysis team

Question: What prompted your interest in understanding the natural environment?

I grew up in rural mid-Wales, up in the mountains but close to the sea. The diversity of landscapes that was on my doorstep means that I've always appreciated the natural environment. My favourite subject in school was geography and I went on to do an undergraduate degree in physical geography at Aberystwyth University. After graduating I wasn't sure what to do next, so took a couple of years out to travel and see the world. I ended up back in Wales and Aberystwyth University studying for a master's degree in remote- sensing and geographical information systems (GIS). During my work experience with the Countryside Council for Wales I discovered that remote-sensing technologies can provide a unique perspective for nature conservation practitioners. I continued this strand of research during my PhD, which was part- funded by Natural Resources Wales.

Question: Why are Earth observation techniques so important?

Earth observation has been around for a long time in the form of aerial photography. Even satellite Earth observation is not a new technology, with the first satellite in the Landsat Programme being launched in 1972. However, the last 10 years has seen an influx of new sensors being launched into space, from very high spatial resolution satellites that can provide images at a spatial resolution of 31cm, to the most ambitious Earth observation programme and a suite of new satellites, the Copernicus Programme.

With so much information being collected from space it's important that we make the most of this valuable resource.

One of the many advantages of Earth observation techniques are their abilities to provide a continuous and frequent stream of information about the surface of the Earth. The data allows us to not only visualise events from algal blooms to wildfires, but also analyse what the state of the environment was before and after. This monitoring capability is critical in areas which are difficult for people to reach. Collecting data in the field is still essential for evaluating information generated from Earth observation techniques, but the images can better inform where people need to be on the ground and when.

These techniques have also been used to discover new things about our planet.

Question: Looking forward over the next 10 years, how do you see Earth observation techniques evolving?

We are inundated with new sensors and volumes of data, so what I would like to see is more tools to better integrate Earth observation data into systems for decision making. With the new age of big data and artificial intelligence upon us, the infrastructure required for this to happen are being developed, but there is still a

disconnect between a variety of users that can benefit from Earth observation data and implementation. So, there are two strands of development:

1. The continuation of technical advancement, such as using artificial intelligence to create products from Earth observation data, and;
2. Building capacity for a range of users to better understand what Earth observation data can do for them, and how to use the relevant information.

Question: What has been your most significant achievement working for JNCC?

One of the biggest barriers of Earth observation data use is the requirement for the data to be cleaned before analysis. This process requires Earth observation expertise to carry out, but I identified that the process can also be automated.

Our team then embarked on a series of projects to identify the most appropriate set of processing techniques and automate them as standard to produce what we call 'Analysis Ready Data' (ARD) for Sentinel-1 and Sentinel-2 datasets. The term ARD is now used globally by the Earth observation community, but we were one of the first. This piece of work has allowed us to remove costs and duplication of effort from projects that used Earth observation data, so we can focus more on product generation and applications. It also allows us to support the country conservation bodies with their Earth observation requirements and is a key stepping stone for us to demonstrate where it can add value to JNCC's work.

Question: Tell us about an Earth observation project that inspires you?

At the end of the day, Earth observation is a tool that can be used and integrated into many different areas of work. One of the most interesting projects that we're currently working on, and an example of Earth observation as a tool, is use of satellite data in modelling the impacts of storm surges and flooding events in Caribbean British Overseas Territories. The information provided can help inform decision making i.e. where is the safest place to build a hotel. This work then contributes to building economic resilience from natural disasters such as hurricanes, but more important than that, can save lives.

Gwawr Jones Senior EO Specialist

Broadening access to satellite data

[Earth observation](#) is the gathering of information about our planet's physical, chemical and biological systems via remote-sensing techniques, using optical and radar sensors on environmental satellites that scan the Earth from space.

The raw data from the European Union's Earth observation programme (Copernicus) satellites are made freely available, but processing and analysing them requires expert skills and involves significant investment in terms of time and cost. Finding the right data and pre-processing them into a ready-to-use format can be a lengthy process that may represent as much as 70% of a project budget.

The increasing availability of Earth observation imagery and open data is supporting development opportunities across the public sector in the UK and our expertise is helping meet environmental policy and operational evidence needs.

The focus of JNCC's work in this field is exploring the potential Earth observation offers biodiversity conservation: advising governments on its application in assessing the status of, and changes in, natural environments, and using technical innovation to turn raw data into standardised data products that are ready to be used directly in a range of applications at a substantial cost saving. Known as Analysis Ready Data (ARD) products, they can be used easily and cost-effectively, and reduce the duplication of effort and storage, since the data only need to be processed once and are held in one place, on a cloud platform. From this work, we have generated UK standards for environmental evidence from satellite data to ensure it is produced consistently and feeds into the development of international standardisation and protocols.

As members of the Defra Earth Observation Centre of Excellence we work collaboratively with organisations from across the Defra network and the devolved administrations on projects covering a range of policy areas, such as rural payments, water quality monitoring, forestry and habitat assessments. We also provide Earth observation skills to accelerate uptake, help the country nature conservation bodies develop their own capabilities and provide our expertise in projects for administrations in Scotland, Wales and Northern Ireland.

In Northern Ireland, JNCC has processed satellite data and generated habitat maps for the Department of Agriculture, Environment and Rural Affairs, which will be using the outputs in its planning, land management decisions and policy making.

We are bringing this approach to the UK's Overseas Territories, where the satellite data are being used in conjunction with other data sources to create habitat maps to investigate environmental resilience, and to Chile and Peru to assist with ecosystem services projects.

Paul Robinson Senior Natural Capital Evidence Specialist

Marine pollution incidents – a UK approach

The UK has a thriving energy industry and one of the busiest shipping lanes in the world – which is why we must be able to respond to every eventuality. The UK Government's marine pollution response system is one of the best in the world and recently featured in a film in which JNCC's Offshore Industries Advice Manager Bethany Graves took centre stage.

The two-minute video, aimed at the public, shows how JNCC works with partners from across the UK to protect marine wildlife following a pollution incident. It explains how we fulfil our UK offshore role and work with the other UK response agencies to co-ordinate a timely and appropriate response.

The video was filmed in JNCC's Aberdeen office and features the Maritime and Coastguard Agency's Lisa McAuliffe, Deputy to the Secretary of State's Representative for Maritime Salvage and Intervention (SOSREP). Lisa talks about the National Contingency Plan and the role the Maritime and Coastguard Agency plays in pollution incidents.

The video can be viewed through the following social media channels:

<https://twitter.com/UKGovScotland/status/1110879999152795648>

<https://www.facebook.com/UKGovScotland/videos/804893593204916/>

Bethany Graves Offshore Industries Advice Manager

Britain's birds hit by weather double whammy in 2018

The recently published 2018 Breeding Bird Survey (BBS) report suggests that the Beast from the East and Saharan winds may have had a big impact on both resident and migrant birds last year.

The short, sharp impact of the snow and ice that came with the Beast from the East may have affected some of our smallest birds in particular. Goldcrest, Wren and Long-tailed Tit numbers were all down in comparison with the 2017 figures. As a group these birds are the real lightweights of the bird world, weighing in at between 5-10g. As such, they can be particularly vulnerable to cold weather, and even though the Beast delivered a brief shock, it appears this was enough to hit these birds hard.

While all this was unfolding in the UK, our usual summer visitors were safely ensconced in sub-Saharan Africa, thousands of miles from any snow and ice. However, when the time came to head back to the UK, strong northerly winds in the Sahara desert seemingly hampered the return journey. This appears to have had quite an impact on the number of returning birds and House Martin, Sand Martin and Swift numbers were all down on the 2017 breeding season surveys.

It wasn't all bad news and some birds apparently managed to either tough it out through the snow and ice, or find a window in the Saharan winds to cross the desert. The Cuckoo was one of the long- distance migrants that managed to time its flight across the desert to coincide with better winds. Not only did they arrive back on cue, they returned to breed in good numbers.

The BTO/JNCC/RSPB Breeding Bird Survey is a partnership jointly funded by the British Trust for Ornithology, Royal Society for the Protection of Birds and JNCC, and the report is published by BTO annually on behalf of the partnership.

Paul Woodcock said about the survey: "The great work done over many years by volunteers on the Breeding Bird Survey has created an invaluable resource for understanding bird populations that now covers over 4,000 sites across the UK"

Paul Woodcock Evidence Specialist

Farewell David

We recently said farewell to our Senior Ornithologist David Stroud MBE. David has retired after 33 years' service with JNCC and the Nature Conservancy Council. During his outstanding career, David has worked tirelessly for conservation in the UK, the rest of Europe and globally – playing a major role in many national and international bodies involved in wetland and waterbird conservation.

Most recently, David was declared Honorary Patron of the African-Eurasian Waterbird Agreement (AEWA), having been part of the bedrock of AEWA since its inception.

In David's honour, his team created a beautiful cupcake woodland to mark his departure from JNCC. We wish David a very long and happy retirement.

Working together for coral reef action in the UK Overseas Territories

Coral reefs are one of the planet's most beautiful and diverse natural environments, providing a variety of benefits or ecosystem services. From the provision of habitats for commercial fish species to protecting coastlines from storm surges, coral reefs play an important role within their communities. However, they are increasingly under threat from climate change, disease outbreaks, invasive seaweed (Sargassum) and other pressures relating to human activities.

Exploring the threats facing [coral reefs in the UK Overseas Territories](#) (UKOTs) and identifying management solutions were the aims of a workshop organised by JNCC and hosted by the Government of Anguilla. The workshop brought together experts from across the Caribbean region to articulate priorities for future work both within their own organisations and in collaboration with partners.

At the workshop, many of the participants met face-to-face for the first time and were excited to share ideas and build new partnerships. Sessions were energetic and participatory, capturing ideas from broad visions to tangible, immediate tasks. Participants drafted coral action plans that will support a coordinated approach to coral projects in the region.

The wide-ranging plans considered research and monitoring, management of human activities, education, restoration and funding. The priorities identified will build on existing or planned management measures in the UKOTs to conserve coral reefs and other marine ecosystems.

External organisations will be able to utilise these plans when preparing funding bids and tailor their work to these priorities – thus maximising the impact of their projects.

Following the workshop, our experts will collaborate with participants to develop and publish the plans, bringing in knowledge from those unable to attend. Many ideas for working collaboratively across the Territories, and with regional and UK bodies will be taken forward, and as a first step, we will establish a platform for knowledge exchange.

This workshop is part of a wider UKOTs Coral Reef Initiative from the Department for Environment Food and Rural Affairs (Defra) to deliver an ambition, outlined in the 25 Year Environment Plan, to promote coral reef conservation and biodiversity. We are working in partnership with the Centre for Environment, Fisheries and Aquaculture Science (Cefas) and the Foreign and Commonwealth Office to share skills and link with other projects, such as the Blue Belt.

Our experts provide evidence and advice in support of environmental priorities in the UK Overseas Territories.

Jane Hawkrige Marine Ecosystems Team Leader

Megan Parry MEAA Assess & Report Manager

South Atlantic Overseas Territories – a communications revolution

Picture an island far, far away, remote and isolated. This was the reality for many of our South Atlantic Overseas Territories until a recent communications revolution in the South Atlantic region. Regular flights are now possible between St Helena and southern Africa and new air links are planned between the Falklands and South America - all these will make movement of people between these Territories and their continental neighbours much easier. The building of the 'South Atlantic Express' fibre optic cable will soon deliver superfast broadband to islands previously dependent on satellite links. Running from South Africa to Brazil, with branches to St Helena and possibly Ascension, the cable will transform the data links between these UK Territories, their neighbours and the rest of the world.

The position of the islands means they are home for a wide range of endemic species found nowhere else in the world. However, their isolation limits data sharing and the type of face-to-face interaction that allows partnerships, transfer of skills and the pooling of resources that are increasingly necessary for effective nature conservation. Two recent JNCC supported events have shown how opening new flight links and laying submarine cables could transform these islands into focal points for UK efforts to support biodiversity conservation in the region.

St Helena's Natural Capital Conference, in March this year, marked the culmination of an almost three-year JNCC work programme supported by the Department for Environment, Food and Rural Affairs (Defra) and the Foreign and Commonwealth Office, through the UK Government's Conflict, Stability and Security Fund. Taking advantage of the new island airport, the event organised by the South Atlantic Environmental Research Institute (SAERI) brought representatives from regional Territories, international scientists and local experts to St Helena to discuss the importance of the environment, socially and economically, to the UK's South Atlantic Overseas Territories. Before the new airport such an event would have been impossible.

Previously the only way to visit St Helena was by ship which took five days from Cape Town and set sail every third week.

Also in March, the Falkland Islands provided the venue to promote the use of Earth observation techniques (mainly satellites and drones) in the South Atlantic. JNCC and regional partner SAERI intend to use a Falklands Centre of Excellence to transfer these skills and technologies into the region. The Centre of Excellence will bring together UK and regional scientists with a background in geospatial science, to build working collaborations between research institutes in South America and the Territories. Greater connectivity between the Falklands and South America through proposed improved air links will come at exactly the right time to make this feasible. Both events supported JNCC's aim to work with the Territories to help them protect their wildlife and manage their environments. This support prioritises enhancing economic security and building disaster resilience alongside biodiversity conservation.

Using a natural capital approach in the Territories, our experts provide information on the benefits the natural environment provides to society. New data- dependent techniques, and partnership building between Territories and their neighbours, are both critical to success. We supported the development of an Information Management System data centre in the Falklands, to establish a central and standard system for data management, accessibility and sharing in the region.

The movement of both people and information is vital. Steve Wilkinson, Head of Strategy Development at JNCC, sees a bright future for data management in the Overseas Territories based on the new submarine fibre optic cables: “This opens the possibility of Overseas Territories making use of large-scale computer infrastructures allowing them to work collaboratively with others across the globe to apply modern techniques, further develop local skills and improve outcomes.”

JNCC also enables individuals to support Territory-to-Territory collaboration, through visits between territories, and by Territory experts to Chile and Namibia. Tara Pelembe, Deputy Director at Falklands-based SAERI and a native of St Helena, is familiar with both countries: “Our recently launched Earth Observation Centre of Excellence, which focuses on South America, and also extends the concept to Namibian partners, shows how the small islands of the South Atlantic are ideally placed to reach out to neighbouring countries to share solutions and work together.”

New airports, new flight links and submarine fibre-optic cables, combined with a JNCC- led strategic approach to supporting the Territories, will in the future transform perceptions of the South Atlantic Overseas Territories.

For almost a decade, JNCC has been working with the wider UK Overseas Territories.

St Helena Natural Capital Conference

Representatives from the South Atlantic territories gathered for the St Helena Natural Capital 2019 Conference. The conference consolidated the final outputs of the two-year Natural Capital Assessment Project across the UK’s South Atlantic Overseas Territories, funded by UK Government through JNCC. Project Manager Ness Smith from the South Atlantic Environment Research Institute (SAERI) organised and welcomed speakers and participants from St Helena, the Falkland Islands, Ascension, South Georgia, the South Sandwich Islands and Tristan da Cunha. Guest speakers included Dimitrios Boumpoudakis from the University of Kent, and Alistair McVittie from Scotland’s Rural College.

Tony Weighell Biodiversity & Ecosystems Services Team Leader

Seed Money – bringing Bastard Gumwood back

There's been a change in fortune for the St Helena Bastard Gumwood - thanks to the dedication of the island's Vanessa Thomas-Williams and a stream of external funding. The tree, endemic to this remote UK Overseas Territory, is now thriving and faces a positive future with the creation of a living gene bank.

Declared extinct at the end of the 19th Century, the St Helena Bastard Gumwood (*Commidendrum rotundifolium*) was rediscovered in 1982 on an inaccessible cliff face on the west of the island. It died a few years later, but not before seeds and cuttings were taken to keep the species alive in cultivation. The population dwindled again, due to problems with hybridisation and low fertility, and in 2008 the species' survival hung in the balance when the last remaining tree in cultivation was damaged in a gale.

But in 2009 the species was thrown a lifeline with a small funding pot from JNCC (£6,100 through Defra) which Vanessa, the Species Officer with the island's Agriculture and Natural Resources Division, used to kick-start an intensive propagation project.

The surviving tree was covered with insect-proof netting to prevent hybridisation, and a painstaking daily programme of hand-pollination and seed collection began. However, due to low self-fertility rates only around 1 in 1000 seeds germinated successfully.

Then, later that year, another wild individual was discovered by Lourens Malan and Andrew Darlow growing on a cliff at Botley's Ley. Cross-pollinating this individual with the last cultivated plant increased the germination rates to 50%, and the species recovery project took off.

Ten years on, and with an additional Overseas Territories Environment Programme (OTEP) funded recovery project, Vanessa is proud of the Division's achievements and thankful for that small, but incredibly significant, seed funding: "I just want to thank JNCC for starting the project work. St Helena has gone from one Bastard Gumwood in the wild to over 6000 individuals and a living gene-bank has been created - one at Drummonds Point and one at the nursery in Scotland.

Vanessa Thomas-Williams with a new sub-species of Old Father Live Forever (*Pelargonium cotyledonis*) recently identified through DNA analysis, soon to be named after Vanessa. ©James Hutchison, JNCC

"As one of four staff members working on endemic recovery this is really positive, but of course there are another 50 endemics which also need our help. This includes the critically endangered False Gumwood (*Commidendrum spurium*), a sister species to the Bastard Gumwood of which there are only six individuals left in the world."

Other species on St Helena currently being supported include the Large Bellflower (*Wahlenbergia linifolia*) and Old Father Live Forever (*Pelargonium cotyledonis*). Both species are critically endangered plants with less than 50 Large Bellflowers left in the wild.

Amanda Gregory Senior Overseas Territories Officer

James Hutchison Senior Analyst

Viewing the BIG PICTURE – from the seabed

Assessing the condition of biological communities on the seabed – using photography or video – is a key approach for national seabed monitoring programmes. To discuss approaches to the collection and analysis of video and still photography, also known as benthic imagery, JNCC brought together organisations from the UK's marine monitoring community. Our BIG PICTURE workshop enabled experts to grapple with a broad range of issues over three days, seeking collaborative solutions and opportunities.

Rocky habitats and their biological communities form natural reefs, harbouring a wide variety of fantastic marine organisms such as cup corals, anemones, sponges, starfish and feather stars. Reef habitats are common across the UK and, when healthy, will attract many larger marine animals such as crabs, ground fish and seals.

However, effective analysis of benthic imagery can be limited by a range of issues – from difficult survey conditions when the imagery is collected, to inconsistencies in analysis methods and the interpretation of the resulting scientific data. During the workshop these issues were explored by the multidisciplinary group of 51 participants, who represented 29 organisations spanning government bodies, research institutes, universities and environmental consultancies. The group also considered how cutting-edge technological developments in autonomous underwater vehicles (AUVs) and machine learning could be better utilised in monitoring programmes.

Following an informative and productive workshop it was agreed that an action plan would be developed to take the work forward. JNCC will lead this work, which will be delivered by a small group of specialists with representation from across the stakeholder group. A forum will be established to improve knowledge transfer, sharing of resources and greater collaboration between the stakeholders. The workshop closed on a very positive note, highlighting the benefits of working together to develop shared solutions and identifying opportunities to meet the emerging challenges of marine seabed monitoring.

Using benthic imagery of these communities, in national seabed monitoring programmes, forms part of our commitment to provide high-quality evidence and advice on UK's network of Marine Protected Areas.

Henk van Rein Marine Monitoring & Evidence Manager

Monitoring focus – The UK Butterfly Monitoring Scheme

JNCC works with partners to run a number of long-term biodiversity monitoring schemes in the UK. In this edition of Nature News we look at the UK Butterfly Monitoring Scheme (UKBMS). The scheme benefits from the commitment of thousands of skilled volunteer recorders – with over 3,000 recorders monitoring a record 2873 sites in 2018.

Since 1976, the UKBMS has monitored changes in the abundance of butterflies throughout the UK. The scheme, run by Butterfly Conservation (BC), the Centre for Ecology and Hydrology (CEH), JNCC and the British Trust for Ornithology (BTO), currently has three components. The original recorder-selected 'Pollard walk' transects are monitored every week throughout the summer. 'Wider Countryside Butterfly Survey' survey lines, which follow a prescribed route and are sited in random 1 km squares, are walked at least twice between July and August. A small number of targeted species surveys also take place, including standardised counts of specific butterfly species, egg, larval or adult forms.

The latest results of the UKBMS (released as [Official Statistics](#) on 29 March) show that last year's hot, sunny summer benefited many species, with over two thirds showing an increase in 2018 compared with 2017. However, abundance levels were only slightly above average for the series as a whole. Over a third of butterfly species in the UK are showing a significant long-term decline in abundance, approximately twice as many as those showing a significant long-term increase. Whilst weather conditions can create noticeable fluctuations in butterfly populations from one year to the next, long-term trends showing a decline in abundance are attributable to changes in the extent, condition and fragmentation of habitats caused by the intensification of farming, forestry practices, urban development, pollution and climate change.

Country level results

As the UKBMS sample size has increased it has become possible to analyse trends for the different countries in the UK. In 2018 there were sufficient data to produce trends for 55 species in England, 13 species in Northern Ireland, 25 species in Scotland, and 33 species in Wales. Trends were similar to overall UK trends.

The following species fared particularly well in each country in 2018. Species with their best year on record for the country are highlighted in bold.

- England: **Large Blue** **Black Hairstreak** Dingy Skipper Green-veined White High Brown Fritillary Purple Hairstreak
- Wales: **Brimstone** Grayling Painted Lady Small Tortoiseshell
- Scotland: Comma Grayling Large White Ringlet
- Northern Ireland: **Marsh Fritillary** Peacock

The UKBMS is highly valued as a key evidence source by the UK's NGOs, country conservation and research bodies. Results from the scheme feed into the UK Biodiversity Indicator – Insects of the wider countryside.

UKBMS results also feed into England and Scotland indicators, and may feed into indicators currently under development in Wales. The data also contribute to the European Grassland Butterflies indicator. Sadly, indicators are reflecting the long-term declines in abundance, particularly so for habitat specialist species. However, landscape-scale conservation efforts can play an important role in improving the fortunes of declining butterfly species, and there have been some success stories. Woodland coppicing, to create more open areas that can support butterfly food plants, has been successfully carried out for the Heath Fritillary. Management of unimproved grassland has benefited the endangered Large Blue, for which 2018 was the best year on record with numbers having almost tripled in the past ten years. The Large Blue is protected under the Habitats Directive, and UKBMS data have been valuable in helping the UK meet its reporting obligations, contributing to the wider understanding of this species at a European level.

Ongoing monitoring through the UKBMS is important to help us better understand the environment, identify where there are problems, and thus provide a stimulus for conservation action.

Butterfly populations are good indicators of environmental change due to their rapid and sensitive responses to subtle habitat or climatic changes, and as representatives for the diversity and responses of other wildlife.

Anna Robinson Monitoring Ecologist

Survey #CEND0119: Collaborating in the English Channel

In our second instalment of the marine survey diary, we focus on a highly collaborative 21-day survey our marine scientists carried out with colleagues from Cefas. It took place in the English Channel, aboard the research vessel RV Endeavour, from 3-25 January. The survey team visited Offshore Overfalls and Offshore Brighton Marine Conservation Zones (MCZs), to collect data which will be used to monitor any changes to the condition of the designated features of these important sites over time.

In planning this survey, we worked with Natural England (NE), as Offshore Overfalls MCZ is a site for which JNCC and NE share responsibility. We also worked with the Marine and Coastguard Agency and UK Hydrographic Organisation's Civil Hydrography Programme (<https://www.gov.uk/guidance/the-civil-hydrography-programme>), whose 2018 hydrographic survey of the site was crucial to our planning and will complement the data we collected on this survey. Ahead of the survey we also spoke with Historic England, who identified shipwrecks of interest to them in the area.

Post 1

With bellies full of turkey and Auld Lang Syne still ringing in our ears, we're off from Lowestoft, on the Suffolk coast, to Offshore Overfalls MCZ. Offshore Overfalls is just east of the Isle of Wight in the English Channel and has a mixture of sediment types that make up its protected features, including subtidal coarse sediment, subtidal mixed sediment and subtidal sand. The site is similar in size to the New Forest National Park.

Post 2

Our first challenge is to produce a more detailed map of what the seabed looks like at Offshore Overfalls MCZ. We will be using a Multibeam Echo Sounder that will tell us two things about the seabed: how deep it is, and how hard it is.

The sonar data also reveal further information about the wrecks Historic England had spoken to us about. One of the wrecks is the SS Alaska, which sank in collision with the British cargo vessel SS Dotterel on 15 November 1939. Two men were sadly lost in the collision but the remaining crew were rescued by other vessels.

Post 3

With our sonar data collected, we begin using the underwater camera system to collect live footage and high-resolution images of the seabed and its inhabitants. We also collect Hamon grab samples from areas of seabed which look 'grabbable', for particle size analysis of the substratum and identification of the animals living within the sediment. As the seabed is quite hard here, many of the stations are deemed to be un-grabbable!

Post 4

We've finished our survey at Offshore Overfalls and move a few miles south to Offshore Brighton MCZ. Offshore Brighton MCZ has similar protected features to Offshore Overfalls MCZ, with high-energy circalittoral rock and subtidal coarse and mixed sediment as protected features. This site is deeper than and roughly ten times the size of Offshore Overfalls.

Survey operations here are focussed on the collection of imagery using an underwater camera system. These provide our team with plenty to talk about and to try and identify, particularly while sampling in a 'rocky' part of the MCZ. Dubbed "Offshore Brighton Rock", this part of the site provides a hard substrate for sessile (non-moving) animals like sponges, bryozoans (sea mosses), anemones and sea squirts, as well as providing nooks and crannies for mobile species including crustaceans and some fish species.

As at Offshore Overfalls, we also collect Hamon grab samples and sonar data.

Post 5

And that's a wrap! We have enjoyed good weather and sea conditions on this survey, particularly given the time of year. We return towards Lowestoft happy in the knowledge that we have completed all of our objectives. We've documented a huge variety of marine life and habitats across these sites, and the data will form a crucial part of a dataset that will be used to monitor how these diverse habitats change over time.

All in all, we have collected 76 Hamon grab samples, and completed more than 200 camera transects and over 2500 km of multibeam bathymetry and backscatter across both MCZs.

Even with the superb weather, this would not have been possible without the hard work of the crew and our Cefas colleagues aboard, so I will close this account with a huge thank you to everyone involved!

Joey O'Connor Marine Evidence Manager

JNCC: Contributing to conservation across the flyway

It's not often that conservationists from across Africa and Europe get the chance to discuss the conservation of migratory species together. And even less often that they do so in Peterborough! But recently experts from both continents did just that – all thanks to JNCC.

The cuckoo, the turtle dove and the nightingale are three of the UK's most-loved bird species. Each one is known for their characteristic song, elusive behaviour and their incredible migrations to and from Africa. But sadly, all three are red-listed in the UK following sustained declines over the last few decades.

Dozens of UK bird species winter in Africa and many of these species, particularly the landbirds, are declining at an alarming rate. Worryingly, these declines are not restricted to the UK, with migratory landbirds across Europe showing significant declines.

As these species breed, migrate and winter across many – sometimes dozens – of countries, intergovernmental cooperation is needed to conserve them. Such cooperation is coordinated under the UN Convention on Migratory Species, the treaty through which African and European nations have adopted the African Eurasian Migratory Landbird Action Plan (AEMLAP), a flyway scale plan to address the issues facing migratory landbirds in both their European breeding grounds and African wintering grounds.

Although the AEMLAP is a significant achievement, there has been a lack of resources to effectively implement the plan – and this is where JNCC has stepped in. Recognising the importance of AEMLAP to conserving some of the UK's most iconic species, and the desire of the UK Government to increase its support for global conservation (as stated in Chapter 6 of the 25 Year Environment Plan), our experts organised a workshop on the AEMLAP's implementation. This was held in Peterborough, in March.

The workshop brought together development, policy and scientific experts from Africa and Europe to identify how greater resources could be directed towards AEMLAP's implementation. Specifically, workshop participants developed a series of project proposals which could be easily tailored to suit the needs of differing bilateral and multilateral funding bodies.

We're delighted that the workshop was a success, with many participants praising our facilitation and the rare opportunity to discuss issues in a neutral and relaxed atmosphere. The value of the workshop was demonstrated almost immediately, as we were able to submit some of the developed project proposals to a recent Defra Official Development Assistance call.

Danny Heptinstall Senior International Biodiversity Adviser

Protecting the harbour porpoise – the UK's smallest cetacean

The harbour porpoise is a small, highly mobile species of cetacean (the collective term for whales, dolphins and porpoises) which occurs throughout UK waters. Recognised as a species of conservation importance, it is protected under several national and international directives and conventions, including the EU Habitats Directive. JNCC is committed to producing robust, evidence-based advice to the Government to ensure effective measures are in place to achieve a favourable conservation status for harbour porpoise – on both a national and biogeographic scale.

Harbour porpoise are protected in UK waters through two key pillars of the Habitats Directive (Annex II and Annex IV):

- 1) The designation of Special Areas of Conservation (SACs) as part of a European-wide network of marine protected areas known as the Natura 2000 Network, and;
- 2) The implementation of measures to protect the species from deliberate capture, injury, killing or disturbance throughout their UK range.

The Habitats Directive is transposed into UK law through the Conservation of Habitats and Species Regulations 2017¹ and the Conservation of Offshore Marine Habitats and Species Regulation 2017² (collectively referred to as the Habitats Regulations). Specialists in JNCC and the country nature conservation agencies work in close collaboration to deliver on these requirements on behalf of the UK.

Given the broad nature of pressures faced by harbour porpoise, from incidental bycatch in fisheries to disturbance from underwater noise, JNCC is involved in a variety of projects to ensure evidence gaps are addressed. We have recently led and commissioned several projects with a specific focus on harbour porpoise in the North Sea, driven by the designation of SACs for this species in February 2019:

- To inform fisheries management advice for SACs, research led by JNCC and conducted by academics at the University of St Andrews' Sea Mammal Research Unit (SMRU) investigated the use of 'pingers' (acoustic devices attached to fishing gear designed to deter porpoise) and closed areas in SACs to mitigate incidental bycatch of harbour porpoise.
- Commissioned by JNCC, SMRU Consulting conducted a comprehensive review to provide a high-level assessment of survey methods (both visual and acoustic) to inform long-term monitoring options for harbour porpoise in the Southern North Sea SAC and wider waters.
- To better understand the distribution and availability of harbour porpoise prey, SMRU and SMRU Consulting were contracted to develop a calorific map of key prey species in the North Sea.

The outputs of these projects will contribute to the assessment and management of the SACs, required to ensure Conservation Objectives of the sites are met. Through

collaborations with the country agencies and professional partnerships with academic institutions, JNCC will continue to support UK Government and the devolved administrations in achieving their ambitions for the conservation of the UK's smallest cetacean.

Julia Sutherland Marine Species Advisor

Window on Wales: Meet our Wales Relationship Management Officer Becky Phillips

Delivering devolved environmental priorities in the UK through shared solutions and joint working is one of JNCC's strengths. To support our work in Wales we have a dedicated liaison officer, Becky Phillips, who is the focal point for relationships between JNCC, Welsh Government and Natural Resources Wales (NRW).

"I'm based in Cardiff and work between the NRW and Welsh Government offices. For the past two years I've been facilitating engagement with our Welsh colleagues across the breadth of our portfolio. My first year in the role was a whirlwind of meeting people across Wales and getting to know their work areas. My list of contacts kept getting longer and for every person I spoke to at least another two names were added to the list. These people became my key contacts and I was able to connect them with my JNCC colleagues.

Anyone who has worked with me knows that I'm fond of a chat and this has served me well. It's a real strength when I'm trying to build open and easy channels of communication between all three organisations.

More recently my role has focused on priority areas of work - jointly agreed every three months by JNCC, Welsh Government and NRW. This ensures I make the best use of my time and focus on the appropriate internal meetings that will give me an overview of our priority work. The meetings, alongside the guidance and direction of my key 'sponsors' in Wales, are key to the success of my liaison role.

Being based remotely from the majority of my JNCC colleagues comes with its own set of challenges. These, however, have been resolved with the use of communication tools and regular scheduled contact with my line manager and the rest of the team. In contrast, being present in Wales is one of the key things that has worked well for the liaison post. Attending important meetings in person and building working relationships while in the same location means that I've been able to develop links quickly and simply for priority work areas. It's often unplanned, informal conversations with colleagues that provide the greatest insight into upcoming work and essential links for joint working.

I've learnt that it can take a long time to get the right people in the room for important conversations, but the effort is worth it. It's often the little things that people value, like finding them a specialist contact or attending meetings on their behalf if they can't make them. Tea and cake always go down well – and I get to eat them too! On the other hand, I've learnt that as a single point of contact I'm not able to do everything, and sometimes things inevitably get missed. Prioritising my focus areas with NRW and Welsh Government has minimised this as much as possible.

From my perspective the main reason the role has worked well in Wales is due to trust. By inviting me to attend key internal meetings and into the offices themselves, both NRW and Welsh Government have placed trust in me that I will use the information I gain appropriately. They enabled this access as they thought that the benefits of having me involved in discussions would outweigh the risks of sharing

this information in the first place. Hopefully I've never given them cause to reconsider this.

In the last two years I've felt welcomed by everyone I've met, and I'd like to think that some of my colleagues here in Wales have become friends."

JNCC works closely with governments of the four countries of the UK to ensure that how we work and what we do are fully aligned with different operating models and organisational cultures.

Becky Phillips Wales Relationship Management Officer

Mapping Europe's seas: JNCC leads project at forefront of mapping Europe's seas

Ensuring that European seabed habitat data are discoverable and available is an important role for JNCC. We help to deliver this information by hosting the EMODnet Seabed Habitats portal, providing a one-stop shop for seabed habitat data from across Europe. We've been part of a consortium of partners across Europe since 2009, taking a leading role in its inception (2009 to 2012) and in its current phase (2017 to 2019).

Seabed Habitats is one of seven themes under the wider European Marine Observation and Data Network (EMODnet). EMODnet aims to provide long-term access to high-quality marine data covering all European coastal waters, shelf seas and surrounding ocean basins. Our marine experts work with partners to make those data freely available for all marine data users, including policy makers, scientists, private industry and the public.

The EMODnet Seabed Habitats portal holds collections of habitat data from across Europe, with separate collations of approximately 300,000 habitat sample points, over 800 habitat maps from survey and more than 80 single habitat models available to view, access via web services and download.

In addition to providing access to existing data and products, EMODnet Seabed Habitats creates new products. The flagship, EUSeaMap, is a full-coverage broadscale habitat map for the whole of Europe's seas. New for 2019, this model has extended to now cover the Barents, North-East Atlantic, Baltic, Mediterranean and Black Seas. EUSeaMap has already been used extensively across the policy, research and industry sectors.

For the first time, by plugging into other international initiatives, we have used our extensive collection of habitat maps to create composite maps for habitats of particular conservation importance. This initial work has focussed on three of the Global Ocean Observing System Essential Ocean Variables – seagrass cover, macroalgal canopy cover and hard coral cover. We have assembled Europe-wide products showing the current best knowledge on the extent of these important habitats.

The portal also plays host to the official product showing the current best knowledge on the extent and distribution of the habitats listed on the OSPAR's (Convention for the Protection of the Marine Environment of the North-East Atlantic) list of threatened and/or declining habitats. This is a composite product that our team updates on behalf of the OSPAR Commission.

EMODnet is an initiative of the European Commission Directorate-General for Maritime Affairs and Fisheries as part of its Marine Knowledge 2020 strategy.

For more information and to view and access all of this information, visit: www.emodnet-seabedhabitats.eu

Amy Ridgeway & Helen Lillis Marine Monitoring & Evidence Team

The Norbrit Agreement: The UK and Norway's joint approach to marine pollution incidents

The UK and Norway share a maritime boundary of approximately 570 miles length. Both countries' water bodies are host to numerous industries, from thriving oil and gas activities to busy shipping lanes. Therefore, it is crucial that we are prepared in the case of a pollution incident to ensure any impacts on the marine environment and our offshore marine industries are minimised. Norway and the UK have developed the Norbrit Agreement which describes joint counter- pollution operations (such as resource availability and communication lines) in the zone extending 50 miles either side of the median line separating the UK and Norwegian continental shelf.

In February 2018, UK Government invited Norwegian colleagues to take part in a national exercise which involved numerous government agencies coming together to role play and respond to a pollution incident in offshore UK waters. The scenario involved a significant amount of oil spilling into the marine environment and travelling across into Norwegian waters. As a result, a commitment was made to build on and improve relationships and share lessons learned across governments.

In April this year, JNCC's Bethany Graves travelled to Horten in Norway, the headquarters of Kystverket, or the Norwegian Coastal Administration (NCA), where she was joined by colleagues from the Norwegian Environment Agency, Marine Scotland, Scottish Natural Heritage, Offshore Petroleum Regulator for Environment and Decommissioning and the Maritime and Coastguard Agency.

Discussions covered response processes and tools, oiled wildlife response, oil spill modelling, environmental sensitivity mapping, and research and development. Participating organisations also discussed how they could work more closely together under the Norbrit Agreement. It was agreed that UK colleagues will observe a Norwegian incident response or exercise should the opportunity arise. Participants were lucky enough to have a tour of the Kystverket response stockpile which included a rapid- response barge, mechanical oil removal equipment such as booms and skimmers, and a test facility. This facility consists of a huge pool filled with oil, which is placed under a range of conditions, including wave activity and temperatures, to test the efficiency of response equipment and chemicals.

Building strong relationships and sharing knowledge, tools and lessons learned are the keys to pollution response, both within the UK and across maritime boundaries. High-quality evidence, international leadership and shared solutions are an important part of this. We are hugely grateful to our Norwegian colleagues for hosting us and look forward to continuing future engagement.

Bethany Graves Offshore Industries Advice Manager

Conservation Conversation

This issue we focus on JNCC's independent Committee member Marian Scott OBE. Marian is Professor of Environmental Statistics in the School of Mathematics and Statistics at the University of Glasgow; she is an elected member of the International Statistical Institute (ISI), a Fellow of the Royal Society of Edinburgh (RSE) a chartered statistician of the Royal Statistical Society (RSS).

Question: Species that inspired you as a child?

There are a few species that I am especially fond of, but the one I will select is the red squirrel. Beautiful colours, fabulous tail and at the risk of anthropomorphising, they always seem so inquisitive. For about 10 years or so, I holidayed regularly on the Island of Arran, a stronghold of red squirrels, and there was nothing more pleasant than looking out the upstairs windows of the holiday home and seeing the red squirrels playing in the trees at the side of the garden. Occasionally they would be very brave and venture in to explore the bird table and feeder. Indeed in that horrible interview question style, if you were an animal what would you be, my choice is squirrel (but only red).

Question: What concerns you most about the natural world?

What concerns me most remains our apparent (global) inability to muster action on the scale that we need to tackle the environmental issues we have created for ourselves. There are of course, pockets of light, inspirational people, but too few of them.

Question: Who is your human hero in the natural world?

I think it would be Rachel Carson, closely followed by David Attenborough.

Question: If you could dine with any four guests who would they be?

Bruce Springsteen, for his music, his words and his social care and commitment. Isaac Asimov, for his Foundation series (I read it before I started my career as a statistician, but the idea of predictability of behaviours and the future, just amazing) but maybe also his I Robot series (especially given the increasing current public debate around artificial intelligence) would be another choice. Eric Morecambe would be my third choice, he still makes me laugh even after all these years. My final choice is Mr Spock, he was my science hero of youth. I am not sure how the conversation would go at dinner, but I think it could be interesting.

Question: Where is your favourite place?

Home, including my home town Glasgow, then following that, I would say Venice - any time I visit I am simply blown away by the townscape and landscape.

Question: Desert Island Disc?

Really hard since so many good things to choose from, but Bruce Springsteen, Born to Run, I think would win.

Question: What do you do away from the office?

Reading is probably my most common activity, I read anything and everything from crime thrillers to science fiction, to Harry Potter and of course science (in the office). I also like dog walking with my sisters, they both have terriers, who are cheeky and fun.

Question: Place you'd most like to visit?

Antarctica would be number one on the list, but given I am not fond of boats (understatement), I think this is highly unlikely to ever occur. Next best would be Greenland, which is more likely.

Question: What would you like to achieve in your time at JNCC?

I would like to see the value of environmental informatics or analytics to be more valued generally, and part of that is of course the communication story around all the work we do at JNCC in this area. I keep being amazed by the work being done, but not sure that its impact is always recognised in the wider communities including our public audience.

Question: If you could choose another job or career, what would it be?

Actually, I would choose the career I have, I am truly blown away by what being a statistician has meant for me. Failing that choice, I think an archaeologist would be a fascinating role (but not too many muddy wet fields).