

The UK Environmental Observation Framework

Delivery Plan 2023-2024



A working document of the UKEOF Management Group

Version: May 2023

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This Delivery Plan is a working document of the UKEOF Management Group and will be updated as the programme progresses. It describes how the United Kingdom Environmental Observation Framework (UKEOF) will be delivered. Further details of the programme itself can be found at: <http://www.ukeof.org.uk/>.

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Delivery Plan Summary

This document summarises the purpose, terms of reference, structure and functions of the UK Environmental Observation Framework (UKEOF) and its Secretariat. In particular, it sets out the scope and timing of activities and deliverables currently planned for the financial year 2023-24, and also includes recent examples of UKEOF outputs for wider reference.

UKEOF brings together public sector organisations with an interest in collecting and using environmental observations in order to improve partnership working and maximise the benefits of observations to the UK including for science, policy and economic growth.

The UKEOF Secretariat is hosted by the UK Centre for Ecology & Hydrology (UKCEH) and facilitates programme and project management, communication and co-ordination between the interlinked work areas, most notably the UKEOF Working Groups. The Secretariat is financed by contributions from Defra, UKCEH and approximately ten other partners. All partners also provide in-kind support for Management Group (MG) and Working Group (WG) activities.

The following pages detail the specifics of activities currently planned to be delivered by the Secretariat over 2023-2024 subject to sufficient funding being secured. It is important to note that the UKEOF Delivery Plan is a working document that is regularly updated over the course of the year depending on evolving requirements and opportunities and shifts in priorities resulting from a continuing discourse between the Secretariat and the UKEOF MG. Currently, the key activities and outputs planned for the year include:

- 1) Organising, facilitating and providing minutes on four UKEOF Management Group meetings, two in-person and two on-line. Providing regular updates on central Secretariat and UKEOF Working Group developments at each meeting.
- 2) Organising, facilitating and providing provide minutes for the five UKEOF WGs, held at frequencies of up to quarterly.
- 3) Working with the UKEOF chair in developing a plan for a new strategic approach to monitoring and observation, and facilitating the activities of the resulting start-and-finish group involving representatives from across the UKEOF membership, including organising a series of on-line meetings, to oversee the process.
- 4) Liaising with individual UKEOF partner representatives to secure the funding necessary to deliver all components of the Delivery Plan.
- 5) Supporting the Date Advisory Group (DAG) in its review of the UKEOF Catalogue and development of plans for its renewal.
- 6) Seeking funding for the upgrading of the UKEOF Catalogue, subject to DAG recommendations and approval from the UKEOF MG.
- 7) Working with DAG in the development of a plan for the next UKEOF conference (to be held in February 2024) around the theme of the opportunities and risks posed by recent developments in artificial intelligence for environmental monitoring and observation.
- 8) Supporting the DAG in the delivery of a seminar on “ELIXIR training”. The aim of the ELIXIR Data Platform is to drive the use, re-use and value of life science data.
- 9) Supporting the Citizen Science Working Group (CSWG) in the co-design of a “question bank” for citizen science inventories.

- 10) Working with the CSWG in the production of briefing notes summarising a) a re-run of a 2016 survey concerning embedding citizen science within UIKEOF organisations, and b) the outcomes from the “Citizen science, farmers and farming” meeting.
- 11) Supporting CSWG in the delivery of an online symposium on the subject of “Inclusivity and Trust”.
- 12) Supporting the Natural Capital Working Group (NCWG) in the delivery of an online workshop on the theme of “Monitoring Net Gain – what it means and how is it applied”.
- 13) Supporting and reporting on a joint NCWG + Earth Observation Calibration/Validation Working Group (EO Cal/Val WG) interactive in-person event to explore the potential of EO to support Natural Capital monitoring objectives, establish how partners use EO routinely/operationally and how capacity is developing).
- 14) Supporting NCWG in delivery of an online event on the theme of “Understanding condition in relation to ecosystem services”.
- 15) Supporting the NCWG in the drafting of two papers on “Impacts of devolution on NC monitoring: drawbacks and opportunities.” and “Use of meteorological data for Natural Capital and Ecosystem Assessments” drawing on outcomes from the 2022 UKEOF conference.
- 16) Supporting the EO Cal/Val group in delivering an event focussed on the development of standardised databases for Earth Observation.
- 17) Supporting the DNA Working Group (DNAWG) in organising and delivering the 2024 UK DNA conference.
- 18) Supporting the DNAWG in the production of a report on making DNA-derived species data available.
- 19) Supporting the DNAWG in the writing and submission for peer review of a scientific paper on the application of eDNA tools for regulatory monitoring.
- 20) Providing regular newsletters to subscribers and Twitter posts when significant activity occurs.
- 21) Undertaking development of the UKEOF website in the process of moving it to a new platform, in consultation with the UKEOF Management Group.

1. Overview of the UK Environmental Observation Framework

1.1. Introduction to the Delivery Plan 2023-2024

The UK Environmental Observation Framework (UKEOF) was founded in 2008 and has since been reviewed and refocused twice. A major review undertaken in 2017 concluded that UKEOF partners and users particularly value three aspects of the framework, namely; i) the UK-wide exchange of knowledge, ii) facilitation of joint activities and production of outputs, and iii) development of cross-partnership strategic agendas and common approaches to emerging challenges. This plan remains founded on the findings and recommendations of the 2017 review (see Annex 2 for full details of recommendations) while setting out planned activities and deliverables for the financial year 2023-2024.

1.2. Aim

UKEOF is a partnership involving UKCEH and public sector organisations with an interest in using, and providing evidence from, environmental observations. It aims:

- To achieve effective partnership working in environmental observations
- To maximise the benefits of observations to the UK including for science, policy and economic growth.

Working with partners and with direction from the Management Group, the aims are met by achieving the following outcomes/objectives:

1. **Provision of a holistic picture** of national environmental evidence needs, and the role of observations in providing the necessary information. This improves the ability of each agency, department or observation initiative to contribute to existing and anticipated national and international programmes, enables optimisation of investments, recognises dependencies, and promotes opportunities to work in partnership.
2. **Maintenance of an open flow of up-to-date information** on environmental observation plans and programmes, so that all organisations are aware what is being monitored by whom and for what purpose. This not only helps inform planning of new initiatives, but also improves understanding of the potential application of existing environmental data to address new challenges, and the means of accessing it.
3. **Enabling effective and transparent decision-making** by embedding the information, ideas and tools developed under the other objectives and encouraging good practice.
4. **Ensuring funding for observation programmes is effective, transparent** and capable of supporting the long-term information needs of the UK and the role of the UK in a global perspective.
5. **Forging and growing a strong community** to ensure the most efficient and effective gathering and sharing of data, knowledge, expertise and technological innovation.

1.3. Secretariat structure and funding

The funders and initiators of UK environmental observations have agreed to work together towards the main strategic priorities for UKEOF (listed in Section 2). The work is delivered through the Management Group and (since 2019) five working groups (Citizen Science, Natural Capital, EO Calibration/Validation, and DNA working groups, and the Data Advisory Group). See Annex 4 for the terms of reference of the groups.

The UKEOF Secretariat is hosted by the UK Centre for Ecology & Hydrology (UKCEH) and provides day-to-day programme and project management, communication and co-ordination between the interlinked work areas. It reports to the Management Group via papers submitted to each meeting. Financial support for the Secretariat from UKEOF funding partners declined progressively over the first 10 years of operation as initial programmes to build up capacity including, for example, the development of the UKEOF catalogue, were scaled back (see Table 1).

Table 1: Total UKEOF partner subscriptions

year	subscriptions
2008-09	£459,000
2009-10	£450,000
2010-11	£271,000
2011-12	£271,000
2012-13	£271,000
2013-14	£271,000
2014-15	£265,000
2015-16	£156,000
2016-17	£154,500
2017-18	£145,500
2018-19	£148,500
2019-20	£148,500
2020-21	£148,500
2021-22	£150,000
2022-23	£150,000
2023-24	£156,000

The time allocated to the Secretariat team for its activities depends on the level of the subscription revenue (see Table 1). In early years, the bulk of financial support for the Secretariat was provided by Defra and the Natural Environments Research Council (NERC), the latter also having responsibility for operating the Secretariat. After NERC withdrew as a direct funding partner in 2017, the Centre for Ecology (now UKCEH) took over the Secretariat, and NERC's proportion of the Secretariat funding contribution. Over the last 3 years, attempts have been made to achieve a more equitable funding model, with slight reductions in matched funding contributions from Defra and what is now UKCEH, balanced by increased contributions from other UKEOF partners.

The current level of funding (see Table 1) covers part time roles for a UKEOF Programme Manager, a Programme Coordinator, a Communication Lead and Secretariat Working Group leads. In total this amounts to around 1.25 of a full time equivalent (FTE) post. Expansion over the last three years in the number of Working Groups has been achieved without a significant increase in budget by reducing the time available for central management activities. Recent increases in staff costs, however, will require an increase in revenue if the current level of effort is to be maintained.

2. Work Areas

2.1. Work Programme

Core activities, pertinent to all UKEOF partners, comprise planning, facilitating and reporting on regular meetings of the UKEOF, including:

- The Management Group, with a focus on partners' strategic needs
- The Data Advisory Group (DAG)
- The Citizen Science Working Group (CSWG)
- The Natural Capital Working Group (NCWG)
- The DNA Working Group (DNAWG)
- EO Calibration/Validation Working Group (otherwise known as the EO Cal/Val group)

In addition, the Secretariat oversees all internal and external communications, and undertakes short, focussed activities concerning issues in specific areas. Recent examples include the provision of advice notes on "habitat condition indicators" and "designing and implementing data portals", and an assessment of the impact of the Covid-19 epidemic on partners' environmental monitoring programmes (see Section 7).

In 2023, the Secretariat is proposing a plan for a **new "start-and-finish" group**, involving representatives from across the UKEOF membership, on the theme of "Towards a unified UK monitoring strategy". This will focus on the development of a central set of principles around the development and maintenance of monitoring initiatives intended to improve the interoperability of observations across the UK, help in the development of a clearer picture of environmental change at a UK scale, provide added value to individual organisation's monitoring data and help to reduce unnecessary replication of effort and improve efficiency.

Since 2020, the Secretariat has also organised, facilitated and reported on a **series of themed conferences**. The purpose of these events is partly to showcase the value of UKEOF in enabling truly UK-level and cross-organisational knowledge exchange in areas of major common interest to UKEOF partners, and also to stimulate new ideas and spin-off opportunities for novel areas of collaboration. The themes of the conferences to date are listed as follows, and proceedings and videos of presentations are provided on the UKEOF websites:

2019: "Environmental Monitoring: meeting evidence needs". A face-to-face event in Manchester (February 2020).

2022: "Approaches to Environmental Monitoring for Natural Capital Reporting Across the UK: Merits of Closer Coordination". An online event (March 2022).

2023: "Integrating Environmental Observations to Meet Evidence Needs". An online event (March 2023).

The Secretariat, in consultation with DAG, are currently working on a proposal for the next UKEOF conference, to be held online in February 2024, to be put to the UKEOF Management Group in June 2023. This is likely to focus on the opportunities and challenges for organisations involved in environmental monitoring and surveillance posed by recent rapid developments in Artificial Intelligence.

2.2. The UKEOF Catalogue

The original UKEOF Catalogue was an INSPIRE compliant, online searchable database of metadata (i.e. knowledge of who is doing what, where and why) covering over 2,000 records. It was developed largely in the early years of UKEOF when central funding was relatively high. It was freely available online resource, linked to via the UKEOF website, and offered the only UK overview of observation activities. An online portal provided direct access for partners to update their records directly.

By 2014, the Catalogue included mapping functionality and geo-located records, enabling visualisation of the geographical distribution of monitoring and observation activities. Reductions in Secretariat funding from around that time prevented any further significant development. Without regular upgrades to software, it was not possible to maintain the functionality of more complex tools such as the geographical interface, and access to this element of the catalogue was removed in May 2021.

During 2022/2023 the UKEOF MG agreed that the services provided by the Catalogue should continue to be a vital and central element of UKEOF's role, and tasked the DAG with reviewing options on how to bring it back up to date and improve aspects of its functionality. Linked open data refers to structured data which is interlinked with other data so it can be queried. It uses URIs (Unique Reference Identifiers) and RDF (Resources Description Framework) to standardise metadata so that it can be queried by computers. The DAG are currently exploring costs for the various options for consideration at the next UKEOF MG meeting.

2.3. UKEOF Groups

A summary of the long term UKEOF Groups is given below, the Terms of Reference for each is given in Annex 4.

The **Management Group** includes representatives of all UKEOF partners. It provides a supported neutral space for organisations to share news, ideas and plans, and to discuss approaches to more efficient and collaborative working. The Management Group steers UKEOF planning and delivery. **The Secretariat** works in partnership with the Management Group members to identify, facilitate and undertake activities of strategic importance to partners.

The **Data Advisory Group (DAG)** is a collaborative forum enabling organisations to share approaches to data management and data science. It considers data sharing initiatives at the UK, EU and global levels, and aims to develop a common long-term vision for making data visible and available, and to maximise its use and application. The DAG has responsibility for overseeing the UKEOF Catalogue.

The **Citizen Science Working Group (CSWG)** provides a medium for member organisations to share good practice, discuss current opportunities and future needs, and develop plans for working with volunteers to provide high quality, environmental observation data.

The **Natural Capital Working Group (NCWG)** focuses on developing a broader understanding of Natural Capital concepts and appropriate monitoring approaches, and sharing knowledge and expertise. Specifically the group is working towards creating a common UK framework for monitoring & assessment of Natural Capital.

The **UK DNA Working Group (UKDNA WG)**, facilitates dialogue and collaboration by providing a forum for the wide community of government agencies, academics and other stakeholders to discuss priorities and emerging developments in the use of DNA for environmental monitoring.

The **Earth Observation Calibration and Validation Working Group (EO/CV WG)** takes a holistic view of the role of earth observation (satellite and drone based) within wider environmental monitoring, focussing on linking observations across spatial scales, i.e. from ground observations to drones to satellites.

2.4 The UKEOF Workplan

The UKEOF Workplan is a live document that sets out to the UKEOF Management Group the proposed future activities of the Secretariat and its operation of the various working groups. Focussing on milestones and deliverables within each financial year, it is reviewed by partners at Management Group meetings where changes may be adopted, depending on members' priorities and the availability of resources. The current workplan, for discussion at the forthcoming Management Group meeting in June 2023, is tabulated in the next Section.

3. UKEOF Work Plan 2023/24

An updated workplan, including status and progress on each item, is reported to the Management Group at each quarterly meeting (i.e. 3 monthly).

Key to symbols in first column

→ Adjusted and carried forward from 2022/23 ★ New activity for 2023/24

No.	Activity	Output	Timescale	Resource	Progress to report		
1. Management Group							
1.1 →	Facilitate MG meetings	Forum for understanding the landscape of environmental observations and sharing knowledge, priorities and expertise. Circulation of information generated by the group.	Quarterly meetings	UKEOF Secretariat, Members attend and provide updates MG Chair: BD	Online Meetings planned for 07/06/23 and 26/09/23 and December In person meeting planned for March 2023, currently canvassing for dates.		
1.2 →	Toward a unified UK monitoring strategy	A Task-and-finish group will develop a set of principles for organisations with environmental monitoring remits to maximise the future interoperability of measurements and data, and improve the ability to provide UK-wide information on the state of, and change in, the natural environment .	Autumn 2023 – Spring 2024	UKEOF Secretariat, Members MG champion: TBC	see UKEOF, Item 5, June 2023 MG meeting		
1.3 →	Regular Horizon Scanning	Maintenance of a list of emerging priorities for UK observations community.	Ongoing	UKEOF Secretariat, Members MG champion: Don Monteith	Ongoing		

No.	Activity	Output	Timescale	Resource	Progress to report		
1.4 ★	UKEOF Conference 2023 Report	A report on the 3 rd UKEOF conference, giving an overview of the event as well as highlighting main points and priorities for the natural capital community.	June 2023	UKEOF Secretariat, Members MG champions: Jo Savage & Don Monteith	Report to be circulated and presented at the June 2023 MG meeting.		
1.5 ➔	Demonstrate efficiencies / cost savings to partners [Recommendation from UKEOF Review]	Report on examples of where sharing knowledge or producing joint outputs has resulted in benefits to partners in terms of efficiencies/ cost savings e.g. new collaborations resulting from UKEOF discussions. Target: two examples per year.	Ongoing – to be reported at each MG meeting	UKEOF Secretariat, Members MG champion: Don Monteith			
1.6 ★	Prioritised workplan [Recommendation from UKEOF Review]	Workplan for 2023/24 defined and agreed by Management Group, to meet strategic needs of partners, specifying outputs that can be co-produced by partners and how impact will be measured	June 2023	UKEOF Secretariat, Members MG champion: TBC	Workplan circulated to MG in June and signed off. Progress updates being given to the MG at each quarterly meeting.		
1.7 ★	Secure funding for the UKEOF Secretariat for 2023-24	Fully signed co-funding agreement	July 2023	UKEOF Secretariat, Members	Agreement to be circulated to the MG in July for partners to approve and sign		

No.	Activity	Output	Timescale	Resource	Progress to report		
1.8 ★	UKEOF Annual Conference	Deliver online conference on the opportunities and risks posed by the rapid emergence of AI tools for the public environmental monitoring sector:	February 2024?	UKEOF Secretariat, Members MG champion: TBC			
2. Citizen Science Working Group							
2.1 →	Facilitate Citizen Science Working Group	Forum for sharing good practice, discussing future needs for using volunteers to provide environmental observation data, including areas where UKEOF could potentially add value	Ongoing Quarterly meetings	UKEOF Secretariat, Community attend and provide updates CSWG Chair: Rob Grew, Environment Agency	Ongoing	a. Run at least four meetings b. Demonstrate added value of networking and sharing through examples. c. Provide reports and updates to MG	
2.2 →	Signpost Citizen Science resources	Web-based signposting of case studies & resources for public sector use of Citizen Science for monitoring	Q2-4 (ongoing)	UKEOF Secretariat, Members CSWG champion: Rob Grew, Environment Agency	Ongoing Dependent on broader changes to website	a. Refresh the UKEOF CS website b. Grow the number of resources available	

No.	Activity	Output	Timescale	Resource	Progress to report		
2.3 →	Evaluate embedding of citizen science in member organisations and its potential future role	<p>A question bank for citizen science inventories for use within member organisations to help monitor the nature and scale of citizen science projects.</p> <p>A briefing note drawing out the conclusions from a comparison of a re-run of the 2016 survey and the original .</p> <p>The value of structured interviews with key contacts within member organisations is assessed and if appropriate further actions planned.</p>	Q2-4	<p>UKEOF Secretariat, Members</p> <p>CSWG champion: Rob Grew, EA (support from Kathy Gill, NE and other nominated sub-group members)</p>		<p>a. The question bank for citizen science inventories has been co-designed and tested with members of the UKEOF.</p> <p>b. The 2016 questionnaire is rerun within member organisations and the conclusions from a comparison with the original are published.</p>	
2.4 →	Citizen science, farmers and farming	Generate a briefing note	Q1-2	<p>UKEOF Secretariat, Members</p> <p>CSWG champion: Michael Pocock, UKCEH</p>		a. Briefing note	

No.	Activity	Output	Timescale	Resource	Progress to report		
2.5 ★	Citizen science, inclusivity and trust	Host a 3-3.5 hour long online symposium in late 2023 on the topic and invite both UK-based and international speakers. Write this up as a briefing note afterwards.	Q3-4	UKEOF Secretariat, Members CSWG champions: Sam Amy, UKCEH Katrin Bohn, NE et al.		a. Symposium (in Q3 2023) b. Briefing note (to be delivered in 2024)	
2.6 ★	Sustainability of data platforms	a. Host a discussion, potentially with external invitees (e.g. CaSTCo), about building sustainability into data platforms and other tools.	Q3	UKEOF Secretariat, Members CSWG champion: Patrick Bell/Giselle Sterry		a. Write up for the WG narrative summary	
2.7 ★	Forum for CS leads in partner organisations	Propose and test ideas for a meeting of CS leads in partner organisations		CSWG champion: Morag Taite		a. Decision on whether a forum would meet needs for the agencies	
3. Data Advisory Group							

No.	Activity	Output	Timescale	Resource	Progress to report		
3.1 →	Facilitate DAG meetings	Forum for understanding the data initiatives landscape and sharing knowledge and expertise. Circulation of information generated by the group.	Quarterly meetings	UKEOF Secretariat, Community attend and provide updates DAG co-chairs: Richard Ostler (Rothamsted) and Sophia Ratcliffe (NBN Trust)	Meeting booked in for 1st June, with additional meetings due late-Sept, and early December.		
3.2 →	Oversee UKEOF catalogue	Oversee the re-development of the UKEOF Catalogue with help from the MG and UKEOF Organisations.	Ongoing through 2023/2024	UKEOF Secretariat, Community provide updates, support, additional resources required. DAG champion: Sophia Ratcliffe (NBN Trust)	Currently working on Project Initiation document to establish redevelopment proposal to seek additional funding required.		
3.2 ★	DAG-led Seminar 1	Seminar on Elixir training	Q2	UKEOF Secretariat, Community attend and provide updates DAG champion: Richard Ostler (Rothamsted)	Had planned to hold this seminar in March as part of a DAG meeting however we will try to hold it later in 2023 as a standalone webinar open to all.		

No.	Activity	Output	Timescale	Resource	Progress to report		
3.3 ★	DAG-led Seminar 2	Seminar on DAG related topic (tbc)	Q3	UKEOF Secretariat, Community attend and provide updates DAG champion: Richard Ostler (Rothamsted) and Sophia Ratcliffe (NBN Trust)	Plan to discuss the topic in a future DAG meeting.		
3.4 ★	Activity for 2023/2024	Assist in organisation of February 2024 UKEOF Conference on Artificial Intelligence	Q2-Q4	UKEOF Secretariat, Members DAG champion: Steve Turner (Secretariat)	Present and gather initial thoughts at June DAG meeting and report back to MG.		
3.5 ★	Output for 2023/2024	Finalise the 'Data Skills' paper	Q2-Q4	UKEOF Secretariat, Members DAG champion: Richard Ostler (Rothamsted)			
4. Natural Capital Working Group							

No.	Activity	Output	Timescale	Resource	Progress to report		
4.1 →	Facilitate NCWG meetings	Forum for understanding the natural capital monitoring landscape and sharing knowledge and expertise. Circulation of information generated by the group.	Quarterly meetings	UKEOF Secretariat, Community attend and provide updates NCWG Chair: Hanna Espie, NatureScot	Online meeting held 18.04.2023. Online meetings planned for 18.07.2023 and Jan 2023. Canvassing for date for joint NCWG & EO Cal/Val event in October 2023		
4.2 ★	Workshop	Host an online workshop planned around the topic of Monitoring Net Gain (what does it mean and how is it applied?).	Q2	<i>UKEOF Secretariat, input from partners</i> NCWG champion: TBC	Date confirmed: 18.07.2023		
4.3 ★	Joint interactive NCWG & EO Cal/Val Meeting/Event	Host an in-person meeting/event to explore the potential of EO to support NC monitoring objectives e.g. monitoring net gain, understanding change, scaling from local to national levels, integrating data. Members are also keen to find out how each partner organisation uses EO routinely/operationally, (and how capacity is growing/developing). Briefing note or report to be produced afterwards.	Q3	<i>UKEOF Secretariat, input from partners</i> NCWG champion: JNCC TBC	Canvassing for date in October or November 2023. Potentially will be held in person.		

No.	Activity	Output	Timescale	Resource	Progress to report		
4.4 ★	Group Meeting/ Seminar or Workshop	Host an online workshop, meeting or seminar on “Understanding condition in relation to ecosystem services”. The group are interested in engaging with academics and stakeholders outside of UKEOF membership on this theme.	Q4	UKEOF Secretariat, input from partners NCWG champion: TBC	Activity to occur later this FY. Exact date in Jan TBC.		
4.5 ★	Group Meeting/ Seminar or Workshop	Host an online workshop, meeting or seminar on “Spatial prioritisation”, e.g. Where are priorities? Identifying locations where ES delivery and NC assets could be maintained or enhanced, and where this may be constrained by landscape characteristics.	Q4 and into spring 2024	UKEOF Secretariat, input from partners NCWG champion: JNCC TBC	Activity to occur later this FY. Exact date in April TBC.		
4.6 ➔	UKEOF Natural Capital Conference 2022 output	Following discussions from the 2022 UKEOF conference on NC monitoring and assessments, the group felt that it was important to draft an academic paper on the “ <i>Impacts of devolution on NC monitoring: drawbacks and opportunities.</i> ” Progress has not been made due to lack of resources, but there is clearly an ongoing need for developing a consensus on “what needs to be measured to understand (and assess changes in) our natural capital, from a science/policy perspective”. The group will continue to focus on ways to achieve this.	Q3-4	UKEOF Secretariat, input from partners. NCWG champion: Lisa Norton			

No.	Activity	Output	Timescale	Resource	Progress to report		
4.7 →	Workshop output	Following the 2022 Workshop, Debbie Hemming (MO) is drafting a paper on the “Use of meteorological data for Natural Capital and Ecosystem Assessments” with assistance from the group.	Q3-4	UKEOF Secretariat, input from partners. NCWG champion: Debbie Hemming			
5. Earth Observation Calibration and Validation (Working Group)							
5.1 →	Facilitate Cal/Val meetings	Forum for organisations to forge better links between ground-based and satellite-based observations, and discuss best practice with regard to technological updates and the changing legislative framework.	Bi-annual meetings	UKEOF Secretariat, Community attend and provide updates Cal/Val co-chairs: Nic Malone (EA), Andrew Richman (EA), and Paul Robinson (JNCC)	Online meeting being held 20.06.2023. Canvassing for date for joint NCWG & EO Cal/Val event in October 2023 Established SHARE-UKEOF community on Yammer for sharing thoughts, questions and ideas		
5.2 ★	Group Meeting	Host a 3 hour meeting on the development of standardised databases for EO. Talks From Donna Lyndsay (OS) and Bridgett Emmett (UKCEH) on a ‘National Field Verification Centre for Earth Observation’ and Scott Simmons (OGC) on plans for AI/ML standards, followed by discussions.	Q2	UKEOF Secretariat, Community attend and provide updates Co-chairs: Nic Malone (EA), Andrew Richman (EA) and Paul Robinson (JNCC)			

No.	Activity	Output	Timescale	Resource	Progress to report		
5.3 ★	Joint interactive NCWG & EO Cal/Val Meeting/Event	See 4.3	See 4.3	See 4.3			
6. UK DNA (Working Group)							
6.1 →	Facilitate DNA WG meetings	Forum for understanding DNA across academic, conservation and regulatory users of DNA tools. Circulation of information generated by the group.	Quarterly meetings	UKEOF Secretariat, Community attend and provide updates DNA WG chairs: Andy Nisbett (Natural England)			
6.2 ★	2024 DNA WG conference	Organise and source funding for 2024 UK DNA WG conference	Annual	To be led by: Laia Rovira-Craven (SEPA) Colin Bean (Nature Scot) Bernd Haenfling (University of the Highlands and Islands) Iveta Matejusova (Marine Scotland Science)			

No.	Activity	Output	Timescale	Resource	Progress to report		
6.3 ★	Activity for 2023	Making DNA derived species data available report	Q3	Debbie Leatherland (Natural England) Lori Lawson-Handley (University of Hull)			
6.4 →	Activity for 2023	Co-author peer reviewed manuscript on the application of eDNA tools for regulatory monitoring.	Q3	UK DNA WG steering committee.			
6.5 ★	Activity for 2023	Citizen science and DNA workshop	Q3	Paul Woodcock (JNCC) Andy Nisbet (Natural England)			
7. Communications and impact							
7.1 ★	Raise awareness of UKEOF and of the value of observation activities	Revised Communications Plan, outlining required communication activities in addition to any workshops and outputs listed above, including website, newsletter, social media and printed material disseminated at events	Ongoing, short newsletters and Twitter posts sent when significant activity occurs. Regularly update Wakelet 'Environmental observations' collection & website	Andy Sier, UKEOF Secretariat & input from partners	Comms plan reviewed and updated Feb 2023; Occasional tweets sent; website content being managed; Wakelet collection being added to; Newsletters sent as and when there is significant activity to report.		

No.	Activity	Output	Timescale	Resource	Progress to report		
7.2 →	Report impact [Recommendation from UKEOF Review]	Report on the impact of UKEOF activities	Ongoing, report twice per year	UKEOF partners and Secretariat	These are collated throughout the year. We welcome new examples from this FY from the MG.		
7.3 ★	New website	New website to replace current UKEOF website	End March 2024	Andy Sier with input from Secretariat and MG	New website development plan currently being prepared for presentation to MG in June		

4. Examples of key recent activities and outputs

UKEOF 2023 conference: Integrating environmental observations to meet evidence needs (Mar 2023)

The third UKEOF annual conference aimed to bring together representatives from environmental policy and management sectors with evidence gathering communities drawn from government agencies, academia and NGOs, and featured a range of exemplar projects and speakers drawn from around the UK. Videos of the presentations are available on the UKEOF website and a summary report will be provided soon (see <https://www.ukeof.org.uk/conference-2023>)

UK DNA Working Group Conference 2023 (21-22 Feb 2023). This event was held at the Fera Science Ltd., at the York Biotech campus, and included a wide range of presentations on the development and application of eDNA-based research within the sphere of environmental monitoring and assessment.

Symposium on 'Farmers, citizen science & environmental monitoring' (13 Jan 2023) (CSWG)

An online event attended by over 200 people - Video recording available

<https://www.ukeof.org.uk/resources/citizen-science-resources/farmer-cs-symp>

UKEOF EO Cal/Val Working Group meeting (May 2022)

Optimal integration of drone surveys within UK Environmental Monitoring — UKEOF. The purpose of this meeting was to assess the volume, interests and needs of drone-based monitoring within UKEOF community and involved 25 participants.

“eDNA week” webinar (January 2022)

This webinar series, comprising of five days of 1 ½ - 2 ½ h seminars, covered the current stats of eDNA research and applications in academia, regulatory monitoring, conservation and industry. The seminars were extremely well attended, with over 500 people registering and an average of 207 attending each seminar. The meeting recordings are hosted on the UKEOF website:

<https://www.ukeof.org.uk/news/uk-dna-wg-2022-edna-week-recordings>.

UKEOF 2022 conference: Approaches to environmental monitoring for natural capital reporting across the UK: Merits of closer coordination

This was the second annual UKEOF conference, and was conducted online via Teams. The aims of the meeting were 1) to review regional, national and international needs for evidence concerning natural capital; 2) share knowledge/information on the current natural capital-focused monitoring strategies and methodologies of the four home nations; and 3) identify opportunities for greater integration, as well as the mutual benefits and limitations of coordinating methodologies at wider scales (from UK upwards). In addition to a series of talks provided by experts in the field, participants contributed to three interactive sessions focussed on seek wider views on the current state of NC monitoring and the need for, and approaches to, greater coordination of evidence gathering and reporting.

Selected talks available on UKEOF website:

<https://www.ukeof.org.uk/news/conf-2022-talks-available>

Habitat condition indicators advice Note

<https://www.ukeof.org.uk/resources/natural-capital-resources/ncwg-habitat-condition-advice-note.pdf>

Designing and implementing data portals advice note <https://www.ukeof.org.uk/documents/dag-data-portals-guidance-june-2021.pdf>

Impacts of COVID-19 on environmental monitoring by UKEOF members. 2021

A report summarising how environmental monitoring by UK public sectors was affected by the Covid-19 pandemic, how they responded and what has been learnt from experience.

[Impacts of COVID-19 on environmental monitoring by UKEOF members — UKEOF](#) (login required: contact Secretariat for assistance)

Impacts of COVID-19 on environmental citizen science: Lessons learned and recommendations for the future. 2021 (CSWG)

The Citizen Science Working Group carried out an analysis of UKEOF partners to determine how the response to Covid-19 has affected environmental citizen science in the UK. Outcomes are reported here:

<http://www.ukeof.org.uk/resources/citizen-science-resources>

Environmental observation around the web (our Wakelet collection). 2022

We regularly add to this collection of relevant articles from across the internet, focussing on environmental monitoring, modelling, remote sensing and earth observation, citizen science, natural capital assessment and environmental data management. Our collection focuses on the UK.

<https://wakelet.com/@UKEOF>

UKEOF Conference 2020: Environmental Monitoring: meeting evidence needs.

The first UKEOF National Conference was held in February 2020, bringing together public sector providers and analysts of long-term data with researchers and a broad range of stakeholders with interests in environmental change. The aims of the meeting were to i) provide a range of examples of current activities and what is being learnt from them, 2) consider opportunities for synergies and efficiencies through more joined up activities and adoption of novel technologies, 3) identify areas where important lines of evidence are currently most lacking 4) consider what can be done to address current gaps. Videos of presentations and poster pdfs are available via the following URL:

<http://www.ukeof.org.uk/conference-2020>

Workshop 'Using Social Media as a Data Source for Environmental Science' - speakers' presentations. 2020

A series of talks provided examples of how social media is increasingly used to provide data for environmental science. Breakout group discussions focussed on issues such as ethical considerations of the use of social media as a data source and the availability of technical enabling tools. Speaker presentations are available here:

<http://www.ukeof.org.uk/news/social-media-for-env-data>

UKDNA Working Group 2020 Conference

The annual conference of the UKDNA Working Group was held at the Natural History Museum on Monday 27th and Tuesday 28th January, with support from the NERC Environmental 'Omics Synthesis centre.

Data Management Planning for Citizen Science. 2020

Guidance booklet providing specific, practical advice to citizen science practitioners (specifically those involved in the planning, collection, storage or use of data) about the development of data management plans to support the value of datasets from citizen science projects.

<http://www.ukeof.org.uk/resources/citizen-science-resources/cswg-data-guidance-booklet-web.pdf>

What is the Future of Citizen Science? What is UKEOF's Role? 2020

To help identify future opportunities for UK governmental bodies to get involved with citizen science, the UKEOF Citizen Science Working Group (CSWG) held a workshop in October 2018 with representatives of UKEOF partners. It identified the broad opportunities that exist and also what it could do to help partners realise them. This briefing is for anyone with an interest in citizen science, especially those in government organisations in the UK.

<http://www.ukeof.org.uk/resources/citizen-science-resources/cswg-horizon-scanning-flyer-web.pdf>

Joint UKEOF-ShARE conference on using drones for environmental regulation and monitoring. 2019

Experts from UKEOF and the Shared Agency Regulatory Evidence Programme (ShARE) met at a two day conference to discuss how the use of drone technology can protect and enhance the environment. The event was hosted by UKEOF partner Natural Resources Wales (NRW) and took place at Glyndwr University, Wrexham, from 29-30 January 2019.

<http://www.ukeof.org.uk/news/drone-conf-2019>

UKEOF-hosted session at the Natural Capital Initiative conference. 2019

Members of UKEOF's Natural capital working group (NCWG) attended the Valuing our Life Support Systems Natural Capital Initiative conference at the Crystal in London in May 2019, where they hosted a session on *Advancing and Integrating methods for natural capital monitoring and assessment in the UK*.

<http://www.ukeof.org.uk/news/ukeof-at-nci-summit>

UKEOF Leaflet – “Underpinning UK Natural Capital Approaches”

This leaflet, produced in 2019 by the UKEOF Natural Capital Working Group, aims to share knowledge and best practice for incorporating existing environmental monitoring into a natural capital management approach. It provides a general introduction to natural capital, an overview of current work on assessing natural capital assets across the UK and, using three case studies, shows how current monitoring schemes have been adapted for use in natural capital assessment.

<http://www.ukeof.org.uk/our-work/natural-capital>

UKEOF Monitoring and Modelling workshop and webinar. 2018

We held a webinar in July 2018 to share the findings from our earlier monitoring and modelling workshop. The webinar was co-ordinated by Gareth Old (UKEOF Secretariat) to widely disseminate findings of the Monitoring and Modelling workshop held in Birmingham (7th March 2018) and to identify next steps. A recording of the webinar (audio and presentation slides) is available.

<http://www.ukeof.org.uk/news/monitoring-modelling-webinar-report>

Communications platforms include the UKEOF website, Twitter account and newsletter. The Scoop.it! page gathering UK-focused articles from across the internet on monitoring and observation, has recently been replaced with Wakelet on the UKEOF website.

5. Risk Log

Note: PM = Programme Manager, MG = Management Group

Score = Impact (Extreme= 5, Major =4, Moderate=3, Minor=2, Low=1) x Probability (Remote=1, Unlikely=2, Possible=3, Probable =4, Highly probable=5).

See Annex 1 for matrix linking scores to RAG status

Owner	Risk	Impact	Probability	Current Status	Mitigating Actions	Status after Mitigation	Contingency
PM	Funding: Committed funds not realised/ met	4	3	A	Co-funding agreement in place. Gain early confirmation before start of financial year, and handle paperwork promptly. Plan ahead and realign work	A	Scale down tasks and re-prioritise as far in advance as possible with revised funding schemes
PM & MG	Funding: Multiple partners impacted by funding constraints	4	3	A	Maintain good communication with MG members throughout the year to ensure any issues are identified early	A	Re-prioritise and investigate different funding models to support project activities
PM & MG	Funding: major funders (DEFRA & UKCEH) unable to maintain current level of contributions	5	4	R	Maintain good communications with core partners and identify risks early	R	Re-prioritise and scale down; viability of programme would depend on the scale of reduction
PM	Personnel: Team sickness delays progress (small team)	3	2	G	Ensure team are aware of progress in all areas, so that urgent matters can be taken up & resolved by another member of the team	G	Reprioritise the workloads of the team to ensure that critical tasks are delivered

Owner	Risk	Impact	Probability	Current Status	Mitigating Actions	Status after mitigation	Contingency
PM	Personnel: Team members leaving	3	4	A	Ensure team are aware of progress in all areas, and work backed up on central systems. Refill vacant posts quickly	A	Reprioritise workloads to critical tasks
PM	Programme: UKEOF duplicates work of other groups	3	2	G	Strong communication with MG and their organisations. Outreach to wider community	G	Adjust work programme to avoid duplication and ensure it adds value
PM & MG	Programme: UKEOF core focus does not align with current monitoring community priorities	4	2	A	Ensure that there is buy in from the community. Engage with key external partners throughout the process	G	Step-by-step approach to allow on-going review; project to be closed if necessary.
PM & MG	Programme: Slippage	3	2	G	Strong project/ programme management. Review progress regularly	G	Realign work plan.
PM & MG	Programme: Creep	3	2	G	Allow a degree of flexibility in the programme, and review regularly with the MG	G	Realign the work plan to accommodate new priorities and reset goals
PM & MG	Programme: Outputs/ recommendations incorrectly interpreted	4	1	G	Progress transparent and directed by partners. Outputs/ recommendations signed off by the MG. Caveats should be clearly stated	G	Withdrawal of outputs/recommendations or rewording to clarify the issues

Owner	Risk	Impact	Probability	Current Status	Mitigating Actions	Status after mitigation	Contingency
MG	Management: Too many bosses – management by committee	3	2	G	Empower the Secretariat for day to day decisions. Have clear work programmes and MG Champions to support work and report to MG mtgs	G	Create a smaller executive to make timely decision where necessary
MG	Partners: Lack of engagement / time input from staff	4	3	A	Maintain good engagement with the MG representatives. Have clear tangible milestones	A	Arrange meetings to discuss the relevance to organisations and the need for their support
PM	Partners: Organisational changes	3	4	A	Swift engagement with new personnel to maintain network	A	Ensure that contact is maintained and new personnel identified
MG	Partners: Organisations do not take ownership of the work / outputs/ engage	4	2	A	Ensure that any work is fully supported by the MG and resources are available to provide the required information	A	Understand why there is a lack of engagement & if necessary alter the focus of the work to ensure it meets the MG needs
MG	Partners: Engagement lost from Devolved Administrations with a perceived London-centric or one size fits all approach	3	4	A	Be aware of and open to the issues. Ensure that activities are based UK wide, including MG meetings. Demonstrate value of UK approach where appropriate	A	Encourage policy makers to consider the benefits of coordinated observation programmes and include this in their policies
PM	Community: Events not well attended	3	2	G	Canvass for dates & advance advertising. Good organisation, set clear objectives and target the audience needed to achieve the outcome. Seek feedback	G	Alter the focus or format of the events. Provide incentives for attendance and input

Annex 1: Risk Model (Ref Forestry Commission Corporate risk register 26/07/2012)

Category 1-7: Manageable Risks

Category 8-14: Material Risk

Category 15-25: Significant Risk

Likelihood	Remote (1)	Unlikely (2)	Possible (3)	Probable (4)	Highly Probable (5)
Extreme (5)	5	10	15	20	25
Major (4)	4	8	12	16	20
Moderate (3)	3	6	9	12	15
Minor (2)	2	4	6	8	10
Low (1)	1	2	3	4	5

Annex 2: 2018 Review - summary of recommendations

A review of UKEOF was published in March 2018. This review was carried out for the UKEOF Management Group to inform decisions about the future of UKEOF, and in recognition of changes to the landscape for monitoring and observation since the last review in 2013. The review consisted of three parts (i) an online survey for partners and users of UKEOF, (ii) revisiting the 2013 review to identify changes since then (iii) analysis of options for the future UKEOF delivery model. The resulting recommendations agreed by the UKEOF Management Group are listed below. These have been implemented through the UKEOF Work Plan and the activities of the Management Group.

Recommendations

- 1. UKEOF Objectives.** The overall objectives of UKEOF are strongly supported and the benefits are highly valued in terms of UK wide exchange of knowledge, production of joint outputs and activities, and developing strategic agendas and partnership approaches. **Recommendation: Overall UKEOF objectives should continue as they are, but (i) with greater recognition of the efficiencies / cost savings of sharing knowledge and producing joint outputs, and (ii) strengthening the relationships with research organisations.**
- 2. UKEOF Activities.** UKEOF activities are highly valued, and delivery of activities through working groups made up of UKEOF partners is very effective. **Recommendation: The overall type and approach of UKEOF activities should be continued, with partners continuing to define and prioritise activities and actively contributing to their delivery via working groups.**
- 3. UKEOF Secretariat.** The role of the Secretariat is highly valued, with partner recognition that the benefits from UKEOF would not be realised without a dedicated team driving activities. **Recommendation: The model of a Secretariat hosted by a UKEOF partner should continue, with the Management Group defining priorities, and providing a champion for each activity.**
- 4. Partner Engagement.** The success of UKEOF activities depends entirely on partner engagement. **Recommendation: Recommendation: To ensure partner engagement, each partner should make a financial contribution and/or specify their in-kind contribution (e.g. minimum 5 days per year, covering agreed activities such as targeting communications within their own organisation).**
- 5. UKEOF Workplan.** There is a need for a clear definition of future activities for UKEOF to enable partners to commit resources and demonstrate that their key strategic needs are being met. **Recommendation: The Secretariat should lead planning activities with the Management Group and working groups to identify key strategic needs and define a prioritised workplan for the next two years that clearly reflects partner priorities. It should include sufficient flexibility to react to changing drivers, while maintaining a clear focus. It should recognise links to other relevant initiatives rather than duplicating activities. The workplan should identify specific outputs which can be co-produced by partners, and specify how the impact of activities will be recorded.**
- 6. Communications.** Not all respondents were aware of all UKEOF activities. **Recommendation: UKEOF communications should be promoted more widely. The Secretariat and Management Group members should direct effort to targeted communications within partner organisations. Each organisation should identify a UKEOF communications lead (or team). Efforts should be made to broaden opportunities for participation in activities, and to strengthen links between the working groups and the Management Group.**
- 7. Catalogue.** The UKEOF catalogue is valued as the only UK-wide database of observation and monitoring activities, and for the INSPIRE Directive. **Recommendation: The Management Group should review use and define expectations for the catalogue and allocate resource accordingly.**

This should include agreeing the priority outcomes needed from the catalogue, identifying any gaps that are needed to inform future policy, and defining how the impact of the catalogue will be measured in future. Secretariat time may need to be allocated to supporting data providers with keeping their records up to date (e.g. 6 monthly reminders with export of records for their organisation and an offer of help).

8. **Strengthening the UKEOF Role.** Suggestions were made to strengthen the UKEOF role through developing common approaches, representing partners, providing advice and creating more direct links to government advisors (e.g. Chief Scientific Advisor sponsorship). **Recommendation: The Management Group should discuss opportunities for strengthening the role of UKEOF, and seek to do this where there is full MG support. This could include the development of common approaches where there is support across the Devolved Administrations. Alongside this the MG should articulate the challenges of governance on monitoring and observation issues of UK interest.**

9. **Funding Model.** Despite declines in partner contributions the current level of c.£150K provides a critical mass of Secretariat support to deliver UKEOF functions and brings in an equivalent value of in-kind support. **Recommendation: The current subscription model should be retained. The period of the agreement should be extended (e.g. to three years) where possible. Additional commissioned activities should be considered by the Management Group on a case by case basis, but only as add-ons to the core UKEOF Workplan. The Management Group should decide whether to define principles and expectations of partner support (e.g. is in-kind sufficient, at what level?) and the balance of funding across UK partners.**

10. **Membership.** **Recommendation: Membership should be kept within organisations with a public sector focus. The Management Group should consider whether to extend partnership invitations to other sectors which may inform environmental monitoring. The Management Group should consider carefully the costs and benefits of extending outside the core environmental remit of UKEOF.**

Annex 3: Role of UKEOF Programme Manager and Secretariat

Programme Manager	<ul style="list-style-type: none"> ● Oversee planning and delivery for the Secretariat at CEH ● Report to Management Group ● Manage the UKEOF programme: <ul style="list-style-type: none"> ○ Update delivery plan, risk register, impact reports ○ Represent UKEOF and develop partnership relationships ○ Oversee projects & development of new ideas ○ Ensure well run meetings & information management ○ Oversee budget, reporting, communications
Working Group Leads & Coordinators	<ul style="list-style-type: none"> ● Provide Secretariat to Management Group & Working Groups ● Work with partners to deliver, report on and communicate UKEOF activities (e.g. include Natural Capital metrics, monitoring & modelling workshop, facilitating discussion and decisions on monitoring, updating catalogue, citizen science activities) <ul style="list-style-type: none"> ● Plan and manage delivery of UKEOF events such as workshops ● Represent UKEOF at external meetings ● Provide UKEOF first point-of-contact via email account ● Provide links & ensure UKEOF is well represented in Wales & Scotland ● Oversee finance including ensure co-funding agreements in place & subscriptions collected, and managing any sub-contracts
Communications Lead	<ul style="list-style-type: none"> ● Develop UKEOF communications plan & work with partners to identify future communication priorities & pathways. ● Deliver communications activities: website, newsletter, twitter account, update standard materials, promote activities & outputs

Secretariat Roles

Programme Manager: Don Monteith

Programme Coordinator: Jo Savage

Management Group Lead & Coordinator: Don Monteith & Jo Savage

Natural Capital Working Group Lead & Coordinator: Lisa Norton & Marcia Spencer

Citizen Science Working Group Lead & Coordinator: Michael Pocock & Hannah Risser

Data Advisory Group Lead & Coordinator: Stephen Turner & Gayatri Suman

UK DNA Working Group Lead: Dan Read

EO Calibration/Validation Working Group Lead & Coordinators: Dan Morton & Jo Savage and Marcia Spencer

Communications Lead: Andy Sier

Annex 4: Terms of Reference of UKEOF groups

UKEOF Management Group

Chair: Ben Ditchburn (FR)

Membership: Scientific and policy representatives (Grade 7/Band 4) drawn from sponsoring Agencies and Institutes.

Purpose: As funders and partners in UKEOF, to contribute to and steer delivery of the partnership, to plan future activities to meet partners strategic needs.

Frequency of meetings: 3-4 per year as necessary

Terms of Reference

1. Programme overview

- Define and co-ordinate the UKEOF programme and ensure that it is supported by the appropriate structures, processes and strategies.
- Monitor progress, high-level risks and issues, take decisions and provide strategic guidance and direction to meet the outcomes/objectives.
- Regularly review the likelihood of the Programme meeting its goals and take appropriate action.

2. Resources Input

- Approve major deviations from the Programme Plan and allocate resources accordingly.

3. Add expertise

- Define and articulate the international and national obligations and commitments, including operational forecasts, which require environmental observations, looking across all of the UKEOF domains.
- Provide overall direction to observation programmes ensuring that the maximum efficiency and effectiveness is made of UK resources devoted to observations and assessments.
- Assign a champion to each area of work/ project to guide the activities, liaise with the Secretariat and represent the activity at Management Group meetings.

4. Outreach and Communications

- Identify and highlight to the appropriate board any emerging issues.
- Ensure alignment between the Programme and their organisation's strategies (transfer the outcomes of UKEOF and embed them within these strategies).
- Engage with other stakeholders (non-member organisations) to encourage the uptake and adoption of UKEOF outcomes.
- Provide a platform for discussion of UK interests in observations.

Citizen Science Working Group

Chair: Rob Grew (EA)

Purpose: The aim of the UK Environmental Observation Framework (UKEOF) Citizen Science Working Group is to provide a forum where member organisations ('partners') can share good practice and discuss future needs and plans for using volunteers to provide environmental observation data. This will enable the sector to take a coherent and mutually beneficial approach, and will include identifying areas where UKEOF could potentially best add value.

Frequency of meetings: 3-4 per year

Terms of Reference

- Provide advice and recommendations on citizen science related matters to the UKEOF Management Group;
- Monitor feedback on outputs from the UKEOF Citizen Science Working Group, identify gaps and potential developments;
- Add value to the citizen science related work of member organisations (and potentially others outside the working group), by drawing on the expertise of the group and identifying areas where UKEOF could potentially best add value;
- Promote greater collaboration between partners on citizen science activities;
- Promote the potential for co-funding of research and other citizen science activities.
- The UKEOF Citizen Science Working Group will meet in person twice a year and twice by teleconference. It will report to each meeting of the UKEOF Management Group and to members' organisations where appropriate.

Data Advisory Group

Co-chairs: Richard Ostler (Rothamsted) & Sophia Ratcliffe (JNCC)

Purpose: Environmental evidence is based on data and information about the environment, which must be open to all if environmental outcomes are to be delivered efficiently and effectively. The purpose of the UKEOF Data Advisory Group (DAG) is therefore to support delivery of and advice on methods for data integration, sharing, and transparency across the environmental observing sector, facilitated by the exchange of knowledge on local, national and international data and information initiatives.

Frequency of meetings: 3-4 per year

Terms of Reference

- Serve as a key forum for co-ordination of data and information sharing initiatives that impact the environmental observations community
- Advise and provide information, to the UKEOF Management Group and other bodies as appropriate, on best practice in data integration, transparency, open data, data sharing and management across the environmental sector at UK, European and wider international level
- Support co-ordination of the UK implementation of the INSPIRE Annex III Environmental Monitoring Facilities (EF) theme

- Manage the UKEOF observations catalogue: ensuring the information contained is up to date, through provision of technical expertise for the platform, and provision of advice to data providers in areas of data management.

UK DNA Group

Chair: Andy Nisbet (NE)

Purpose: The DNA Working Group provides a forum for government agencies, academics and other stakeholders to discuss priorities for the use of DNA in environmental monitoring and to ensure effective communication with the wider community of interested groups and organisations. The Working Group helps facilitate methods development, share learning and good practice, explore technical challenges, develop collaborative opportunities and leverage research funding.

Frequency of meetings: Twice per year plus organisation of one national conference per year.

Terms of Reference

The DNA Working Group will:

- Provide a link between researchers, developers of DNA based monitoring methods, and end users to ensure that activities are focussed on meeting priority information needs and that knowledge is transferred effectively within the wider community
- Support and encourage best practice and the development of standards to inform the evaluation and use of DNA based methods.
- Engage and work collaboratively with others nationally and internationally, seeking opportunities to influence research, share best practice, facilitate re-use of samples and data, and increase capacity.
- Promote the use of DNA based methods and increase the awareness of the opportunities DNA based methods may provide to improve organisational efficiency and effectiveness.
- Ensure good communication with the wider UKDNA network¹ and the End Users Group²
- Support and co-ordinate DNA Technical Groups³ that focus on specific applications of DNA in environmental monitoring

By joining the DNA Working Group members agree to

- Use the Terms of Reference to guide the activities of the Working Group;
- Input into the development and implementation of a deliverable Work Plan;
- Work towards completion of the agreed activities within the allocated timescales, including taking on the role of Working group Lead as needed;
- Promote awareness of the activities of the Working Group within their organisation, and externally when appropriate.
- Attend and participate in face-to-face and teleconference meetings of the Working group, or nominate and brief a representative;

- Use the Working Group as a forum to share information about planned and potential projects, and facilitate this exchange by circulating information in advance of each meeting.

Natural Capital Working Group

Chair: Hanna Espie (NS)

Purpose: To build a common understanding of Natural Capital and how it relates to both the UKEOF community and decision making

Frequency of meetings: 3-4 per year

Terms of Reference

- Provide advice and recommendations on Natural Capital related matters to the UKEOF Management Group
- Identify needs, gaps, and potential developments relating to Natural Capital monitoring
- Add value to the Natural Capital monitoring-related work of member organisations (and potentially others outside the working group), by drawing on the expertise of the group and identifying areas where UKEOF could potentially best add value
- Promote greater collaboration between partners on UK Natural Capital monitoring
- Share approaches and best practice, and identify capacity issues which may restrict reporting
- Promote the wider dissemination of information and accessibility of data which highlights how Natural Capital underpins the provision of ecosystem services
- Identify the potential for collaboration and/or co-funding for Natural Capital monitoring and related research
- Monitor feedback on impacts and outputs from the UKEOF Natural Capital Working Group

Cal/Val Working Group

Co-Chairs: Paul Robinson (JNCC) and Andrew Richman (EA)

Purpose: To bring together experts in satellite and drone remote sensing and ground-based monitoring to promote mutual understanding and improved collaboration towards enhanced information products. Frequency of meetings: 2 per year

Terms of Reference

- To enhance communication between monitoring communities, remote and ground-based.
- To provide a forum for best practice in the derivation of EO products.
- To identify methods and resources to support the data needs of remote sensing
- To support the derivation of enhanced digital products describing the UK land surface and in doing so
- Support a more targeted application of ground-based monitoring activities
- To provide advice and recommendations on satellite-based land cover monitoring and how to improve digital land surface information through improved integration of monitoring communities.
- Identify the potential for collaboration and/or co-funding for novel EO initiatives
- Monitor feedback on impacts and outputs from the UKEOF Cal/Val working group

Annex 5: UKEOF Partners

Current UKEOF partners are listed below.

British Geological Survey (NERC/UKRI)
Department of Agriculture, Environment Rural Affairs Northern Ireland
Department for Energy Security & Net Zero
Department for Environment, Food and Rural Affairs
Economic & Social Research Council (UKRI)
Environment Agency
Forestry Commission
Joint Nature Conservation Committee
Met Office
Natural England
Natural Environment Research Council (UKRI)
Natural Resources Wales
NatureScot
Office for National Statistics
Scottish Environment Protection Agency
Scottish Government
UK Centre for Ecology & Hydrology
UK Space Agency
Welsh Government