

Defra Science Advisory Council (SAC)

Minutes of meeting, 7 September 2022

Actions arising

Action number	Action	Owner
01	CSA requested notes for BNG section	Secretariat

1. Welcome and apologies

The Chair welcomed attendees, apologies are recorded in Annex A.

2. The Chief Scientific Advisor (CSA) Update

The CSA shared a summary of their first meeting with Ranil Jayawardena MP, the new Secretary of State (SoS) for Environment, Food & Rural Affairs.

The SoS would like to shift Defra's focus from one of regulation to one of growth outlining his top four priorities:

1. Food security (increasing production and innovation),
2. Improving water quality and security,
3. Growth
4. The United Kingdom's (UK's) place on the international stage in terms of science.

The CSA notes that the SoS is keen to get involved in the Convention on Biological Diversity ([COP15](#)) and the climate negotiation process (occurring through the United Nations Framework Convention on Climate Change ([UNFCCC](#))).

The CSA also updated the SAC on the following:

1. Water continues to be a big issue within Defra with droughts, flooding and sewage considered important topics requiring scientific input.
2. The Genetic Technology (Precision Breeding) [Bill](#) is currently progressing through parliament and should shortly be going to the House of Lords.
3. The Farming Innovation Programme which is relevant to the current challenges being faced by farmers due to fertiliser prices and CO₂ supply for food systems. The Programme is part of a large R&D settlement. As part of this Defra will be working with UK Research & Innovation (UKRI) and hoping to announce a net zero joint programme in the coming months.
4. There is a desire to establish an international body on pollution (with the UK, Switzerland and Norway championing this). The United Nations Environment Assembly have started the scoping and phasing for this.
5. This meeting will be the current Deputy CSA's (Dr Robert Bradburne) last meeting before their departure from Defra. The DCSA was thanked for all their work with the SAC.

3. Biodiversity net gain (BNG)

Biodiversity net gain is an approach that intends to deliver measurable improvements for biodiversity by creating or enhancing habitats in new developments. This can be achieved on-site, off-site or through a combination of both measures. Under the [Environment Act 2021](#) Defra intend to mandate net gain using a specified biodiversity metric. The habitats are to be managed for up to 30 years and must deliver at least 10% BNG.

Defra presented work currently being undertaken on the development of a biodiversity metric in order to calculate “[biodiversity net gain](#)”. The aim is to address the habitat loss impacts of urbanisation and improve consistency in planning processes for new developments by defining and measuring biodiversity value at a site scale. Defra have made adaptations to Natural England's biodiversity [metric](#) and are currently consulting on biodiversity metric [3.1](#); proposing to formally publish this as the statutory metric (version 4). The statutory metric will be used for assessing habitat changes for Town and Country Planning Act [1990](#) development and Nationally Significant Infrastructure Projects, and to determine whether this is expected to meet the requirement for a 10% increase in biodiversity value. Defra asked for the SAC's steer on future changes and perceived risks of the biodiversity metric.

Connectivity in metrics is an area Natural England and Defra have explored. Difficulties arose in this work around the most appropriate connectivity measurements to use in the biodiversity metric to have real value in showing habitat loss. Different methods of including connectivity measurements into the biodiversity metric tool were discussed. Defra's aim is to ensure a consistent approach in measuring BNG through use of the metric tool. The SAC noted that the current biodiversity metric tool was complex and would require qualified ecologists to use it to create assessments. The SAC felt that academic institutions could provide support by ensuring Ecology courses equipped new graduates with the appropriate skill set to use the application.

Defra stated that in the current tool, habitats are being used as the best practical option for measurement of biodiversity gains and losses at the site scale. Defra, however, noted that using habitats as the biodiversity measure has limitations owing to its simplification of complex ecological processes. In the following three to five years, Defra hopes to explore whether integrating flora and fauna measurements into the biodiversity metric tool would be an improvement.

The SAC discussed Defra's current monitoring schemes; noting that the UK, being one of the most environmentally monitored nations, has a strong resource for widespread monitoring coordination led by Defra. The SAC suggested that Defra

consider aligning data monitoring capabilities from the Natural Capital and Ecosystem Assessment (NCEA) with the biodiversity metric tool. Defra were asked to consider the risk of land potentially being converted for BNG purposes resulting in low species diversity.

The SAC discussed the possibility of developing a biodiversity offset bank for small developments to pool together land and using the metric tool to calculate the percentage of land needed for BNG. Using a form of Green Finance and biodiversity offset banking could facilitate large-scale restoration programmes, potentially run by an independent organisation with the experience to ensure a good level of species diversity is introduced in the restoration programme. The SAC discussed the different onsite and offsite biodiversity banking options and the value each option could bring to BNG. Defra were asked to consider the possibility of biodiversity restoration by developers leading to low quality BNG and how this could be avoided.

Defra were asked to consider ways to plan for future changes in habitat values as the metric evolves over time or making comparisons of diversity through time would be difficult. The SAC felt the habitat focus approach was sensible but there is a science gap on connectiveness and scoring. The need to consider functionality of ecosystem services in relation to biodiversity was raised; and Defra were asked to consider the use of National airborne LiDAR (Light Detection and Ranging) to provide 3D habitat re-construction.

Information regarding the Scottish approach to BNG assessments were shared with Defra. Furthermore, Defra were informed of the outputs from the Welsh Government's biodiversity assessments which had fostered collaboration and focused discussions on biodiversity monitoring needs.

Defra responded to the SAC that they felt a systems approach would be helpful to align with NCEA, but more work is required to effectively merge both sets of data. There is still the requirement to test the metrics that have been developed.

Action 01: CSA requested notes for BNG section

4. Marine Natural Capital and Ecosystem Assessment Update

Marine Natural Capital and Ecosystem Assessment (mNCEA) programme was last discussed by the SAC in December 2021 ([minutes](#)). The mNCEA programme aims to assess progress towards environmental targets and indicators ([UK Marine Strategy](#) and the [25 Year Environment Plan](#)) and evaluate policy and programme measures aimed at managing the marine environment. Marine monitoring in the UK covers a wide range of areas, including biodiversity, eutrophication, non-indigenous species, marine litter, radioactivity, and fisheries. Defra acknowledges marine monitoring data is fragmented due to limited strategic oversight and coordination.

Data gaps have been highlighted in this field in the update to the UK [Marine Strategy Part Two](#) published in 2021. The mNCEA programme is aiming to improve the way data is being used strategically for decision making. Defra's intention is to move from a status-based to a natural capital system in marine monitoring.

A marine status-based monitoring approach uses long-term time-series data to assess change over time in specific features to evaluate the health of the marine environment. This approach limits opportunities to adopt an integrated view of the marine environment. A natural capital approach considers a multi-dimensional view, incorporating how environmental, economic, and social challenges interact as we manage UK seas.

The SAC asked Defra to clarify which ecosystem services will be measured and if marine biodiversity will be calculated separately. In response Defra provided carbon sequestration and recreation as examples of ecosystem services which will be measured to understand their value. Defra aim to include more varied ecosystem services in the mNCEA assessment in the future, but this needs to be balanced with value for money. Defra informed the SAC that the United Nation (UN) framework on Biodiversity lists biodiversity as an indicator of natural capital state, rather than being directly measured. Scientific literature, however, debates if biodiversity should be measured and Defra are still exploring this.

The SAC suggested Defra run two systems in parallel, the traditional monitoring system (status-based approach) and the new (natural capital-based) approach for a short time to ensure a smooth transition. Defra were asked about their plans for looking at natural capital data from the past; in response the SAC were informed of Defra's intention to do this when the data becomes available. Defra were asked to look at how effectiveness will be measured. The SAC noted the importance of ensuring monitoring is done correctly with appropriate use of historical records. It was also noted that comparing the two systems (status based and natural capital) to evaluate the affect changing to the new system (natural capital) will have on policy is likely to be a difficult task. The SAC welcomed Defra's approach to assessing natural capital in many policy discussions and viewed this as a helpful approach. The SAC felt more understanding is required of what exactly natural capital is. Defra were also asked to think about how to value genetic diversity and resilience of a system and how this could be incorporated into current thinking.

The SAC discussed the use of metric tools to show changes over time in natural assets. Defra explained that the mNCEA team have based their measurements for marine natural capital on the UN's System of Environmental-Economic Accounting - Ecosystem Accounting (SEEA EA) [framework](#), with the intention to measure additional ecosystem services on top of the systems currently being monitored.

The SAC suggested Defra look at launching a funding competition around improving marine data systems and data management approaches with the CSA advising that the SAC can help inform future proofing of data gathering.

The Scottish government representative felt the value being delivered by the Natural Capital data cannot stand alone and should be monitored in conjunction with other factors, for example: can natural capital data show if waters surrounding industrial fish farms are safe for swimmers; are fisheries managed sustainably long term; or are carbon stores sustainable and well managed? It was considered important for the Natural Capital data monitoring programme to prove the value in/of nature to the public and to demonstrate the benefit of shifting from status-based monitoring to Natural Capital based monitoring.

5. Green Finance

Defra's Green Finance program and its aims were introduced to the SAC. Defra explained their collaboration with the Department of Business, Energy & Industrial Strategy (BEIS) and HM Treasury (HMT), on green finance, and the recently agreed goal (in the Spending Review 2021) to increase private finance flows into nature's recovery from around £100 million a year to over £1 billion a year by 2030. Defra informed the SAC that they are supporting the work of the market-led Taskforce on Nature-related Financial Disclosures ([TNFD](#)); and are drawing on evidence from a number of different bodies, including the United Nations Development Programme Biodiversity Finance Plans ([UNDP BIOFIN programme](#)) and work done by the Organisation for Economic Co-operation and Development ([OECD](#)).

The SAC advised Defra to move beyond carbon counting and investigate how to stack credits representing various ecosystem services, and how to account for credits in regulated and voluntary markets. The SAC also noted that the voluntary biodiversity credits market has potential to become more popular than the regulated biodiversity offsetting market due to credits not being as spatially constrained as offsets. The SAC felt that in some situations, investment should be able to blend nature-based solutions with hard infrastructure to provide better efficacy, however the evidence-base for this needs to improve. The SAC noted that a method for improving permanence would be to use nature covenants.

The SAC asked Defra to assess how to avoid double counting offsetting projects. The SAC suggested a good approach to tackle double counting and carbon credit trading would be to link up existing offsetting registers such as the [UK Land Carbon Registry](#), the [Biodiversity Net Gain](#) (BNG) register, and other registers set up by the private sector. While the SAC noted that Defra already has conditions in voluntary markets and are developing carbon and water codes, it was considered that there is a need for a trusted space to provide independent oversight of carbon trading and standard setting for investors trading. The SAC were interested in how Defra could use Green Finance to drive growth as opposed to stifling it by regulation.

Risks associated with natural capital investments were discussed. Defra were asked to consider how they could manage long-term portfolios for stranded assets (e.g., fossil fuel resources and infrastructure no longer productive and potentially becoming a liability) when moving away from fossil fuels. Defra informed the SAC that TNFD are looking at nature related risks – both physical and transition risks. Greater knowledge and understanding of these risks should encourage private investment in nature positive activities. The SAC queried how food production would be affected if green investment was being used to divert land and resources to meet the 2030 biodiversity goals. Defra responded that they recognise the importance of food security and committed to a Land Use Framework in the [Government's Food Strategy](#) published earlier in 2022.

In terms of risk mitigation, Defra highlighted an example of insurance companies potentially benefitting from natural flood management activities, but that benefit not necessarily being passed down to insurance premiums for local communities living in these high flood risk areas. Working with insurance companies on Natural Flood Management (NFM), could therefore provide an additional market mechanism for the funding of the natural environment.

6. Convention on Biodiversity (CBD)

Defra briefed the SAC on the negotiation preparations for the upcoming Convention on Biodiversity (CBD) Conference on Parties (COP) 15 scheduled for December 2022. The global biodiversity framework is proposed to be adopted at [COP15](#). The SAC discussion focussed on the evidence underpinning the global biodiversity framework.

Defra asked the SAC to consider if the overall framework is sufficient to meet the global biodiversity challenge. To achieve the framework outcomes by 2050 there are a series of actions that can be taken by 2030 to address the threat, to maximise the benefits to people, to implement tools and solutions and to provide the means of implementation. SAC expressed concern that soil biodiversity was not specifically referenced within the [draft post-2020 global biodiversity framework](#).

Defra informed the SAC that they had prioritised goals and targets related to conservation of ecosystems and species. The SAC suggested Defra look at linking this work on global biodiversity framework with that done by The Biodiversity Targets Action Group (BTAG; a SAC subgroup which has now been stood down). BTAG was focused on environmental targets in England and had carried out a lot of analysis on environmental targets, feasibility and pathways. The SAC felt that the connection between what can be done in the UK and what can be done globally is interesting and worth exploring further. Defra recognised that how the UK biodiversity targets related to the global biodiversity targets and the underpinning science needed to be explored further.

The SAC raised concerns with data variation between countries even when using the same indicators and, therefore, how quality assurance would be brought into the process. The SAC noted technology transfer is critical in helping countries that lack the available tools or laboratory access and how the UK's global scientific reach

could be mobilised to facilitate technology transfer with appropriate funding. Limitations of the CBDs national level reporting was discussed with the SAC noting how at sites that cross international borders actions that are put into place by one nation may be different than its neighbour's which could have knock on ecosystem effects.

The SAC recognised that there is a challenge for the CBD on how to hold parties to account in terms of monitoring, reporting, reviewing and assessment. The SAC discussed the proposed goals and targets of the draft global biodiversity framework and what is feasible and asked if the UK is trying to be too precise in the wording for actions that are intended to be rolled out globally. The SAC also enquired about the data that is available to inform Defra of the targets needed for the CBD. Analytics may enable simplification down to a few targets.

The SAC recognised that there could be capacity and resource issue implications for the UK in adopting some of the CBD framework indicators that are not already in use and the knock-on effects. The SAC suggested that a smaller list of indicators would be more feasible for all parties to implement reasonably well with some quality assurance.

The UK has a very small proportion of land classed as natural or semi-natural. Similarly, degradation cannot be applied equally as the definition of degradation is not universal. The SAC felt that for some countries the focus will need to be on the protection of ecosystems and for countries like the UK the focus should be on restoration of degraded ecosystems. Parties will need to respond to a universal framework in different ways.

7. SAC wrap-up session, future SAC discussion proposals, and any other business

The SAC considered greater internal collaboration within Defra might be beneficial to the projects discussed at this meeting and offered their support to help Defra enhance collaboration (e.g., via stand-alone focused Defra-SAC workshops). The SAC felt more thought was needed in identifying gaps and opportunities for joined up work especially regarding biodiversity.

The SAC reflected on data gathering and the potential growth for Green Finance in the UK, they noted a focus on data gathering and felt this should be extended to include how the data could be effectively used, and how public preconceptions around land use sharing could be reviewed. The SAC discussed how Defra could assess short-term/intermediate goals given results can take many years to see. The SAC felt data would need to be used intelligently and ideally work should begin, with framework's put in place to ensure continued monitoring and learning which can be incorporated into policy.

Annex A: Attendees and apologies

SAC Members

Louise Heathwaite (Chair)	Rowland Kao
Richard Bardgett	Rosie Hails
Lisa Collins	Nick Hanley
Peter Cox	Marian Scott
Felix Eigenbrod	Lin Field

Defra's Chief Scientific Adviser's Office

Gideon Henderson – Chief Scientific Adviser
Rob Bradburne – Deputy Chief Scientific Adviser
SAC Secretariat

Devolved administration observers

Matthew Williams – Scottish Government Observer
Caryl Williams – Welsh Government Observer

Defra and other officials in relation to specific agenda discussion

Marine and Fisheries G6
Marine and Fisheries
Land Use Strategy / Net Gain Policy and Legislation
Biodiversity Net Gain Policy and Legislation
Green Finance and Green Recovery
Green Finance and Green Recovery Deputy Director
International Biodiversity and Wildlife
International Biodiversity and Climate Director
International Biodiversity and Wildlife Deputy Director

Defra observers

International Nature Climate and Development Deputy Director
International Biodiversity and Climate International Biodiversity and Wildlife

Apologies

Susan Owens – SAC member
Alistair Carson – Northern Irish Government Observer