



Department
for Environment
Food & Rural Affairs



Science
Advisory
Council

Defra Science Advisory Council

Annual Report: April 2014 – March 2015



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Overview of the Science Advisory Council

What is the SAC?

SAC is an advisory non-departmental public body that provides expert independent advice on science policy and strategy to the Department for Environment Food and Rural Affairs (Defra).

Terms of reference for the SAC can be found at:

<https://www.gov.uk/government/organisations/science-advisory-council/about/terms-of-reference>

How does the SAC operate?

SAC's working practices are detailed in the SAC Handbook, which can be found on the SAC website; primarily it is organised in four ways:

- principal meetings;
- monthly teleconferences;
- subgroups on specific evidence areas; and
- Defra Official and SAC Member pairing scheme.

How can I contact the SAC, or invite SAC members to a meeting?

Email: science.advisory.council@defra.gsi.gov.uk

Want more information about the SAC?

Go to:

<https://www.gov.uk/government/organisations/science-advisory-council>

Register for email alerts or an RSS feed of document publications at:

<https://www.gov.uk/government/latest?departments%5B%5D=science-advisory-council>

Who are the SAC?

Professor Charles Godfray – Hope Professor in the Zoology Department and Director of the Oxford Martin Programme on the Future of Food at the University of Oxford. His research interests include ecology, epidemiology and evolutionary biology

Professor Peter Liss – Professorial Fellow in the School of Environmental Sciences at the University of East Anglia. His research interests are in ocean-atmosphere interaction particularly involving trace gases.

Professor Ian Bateman – Professor of Environmental Economics and Director of the Centre for Social and Economic Research on the Global Environment at the University of East Anglia. Main research interests are integrated environmental and economic modelling for decision making.

Professor Sheila Bird – Visiting professor at the University of Strathclyde's Department of Mathematics and Statistics, and Programme Leader at the MRC Biostatistics Unit, Institute of Public Health, Cambridge. Her research interests include UK dietary exposure to BSE, autopsy surveillance for carriage of subclinical variant CJD, and the application of statistical methods to the criminal justice system's treatment of drug-dependent offenders.

Professor Louise Heathwaite – Professor of Land and Water Science, Lancaster Environment Centre, Lancaster University. Her research interests are in diffuse nutrient pollution, wetland hydrochemistry and water quality.

Professor Judith Petts – Pro-Vice-Chancellor (Research and Enterprise), University of Southampton. Research has focused on environmental risk governance and response to environmental and health hazards in areas such as climate change, energy, waste management, land contamination, natural hazards, and health and wellbeing.

Professor Lynda Warren – Emeritus Professor of Environmental Law at Aberystwyth University. Research interests centre on how law and science are used in developing and implementing environmental policy, focusing on two main areas – radioactive waste management and nature conservation.

Professor Sarah Whatmore – Professor of Environment and Public Policy at the University of Oxford. Her research addresses the relationship between science and democracy and is concerned particularly with the nature and role of expert knowledge in the management of environmental resources and risks, including those relating to water, food and biodiversity.

Executive Summary

This is the third Annual Report of the Defra Science Advisory Council (SAC) and covers the period from April 2014 until March 2015.

The SAC is a Non Departmental Public Body (NDPB) which provides independent and scientific support, advice and challenge to Defra.

The SAC supports Defra, at various levels, by providing a valuable and strategic advisory role. This is coupled with an assurance and challenge role in respect of the evidence Defra uses in its policy development.

During this reporting period the SAC has seen a number of changes with the retirement of the Chair and a member, and the appointment of a new Chair and two new members to return SAC to its full capacity of seven members plus the Chair.

In addition, the SAC was subject to a triennial review, which was published at the end of the reporting period. SAC has begun to implement the recommendations of the report and will continue to do so over the forthcoming year.

SAC discussion topics have been wide ranging from briefing and updates on topics such as air quality and the ownership structure for Defra Executive Agencies; to detailed activity on the plans for the proposed methodology for the second climate change risk assessment (CCRA2).

On the CCRA2 activity, Defra's CSA and climate change adaptation team both highly valued the SAC's independent, expert review, which has influenced the methodology for this statutory national risk assessment.

In relation to SAC activity on food evidence, Defra used the input from SAC to help develop a more integrated approach to farming and food evidence resulting in a Food and Farming Network Evidence Action Plan (NEAP)¹ and joined up activity with Research Councils on resilience.

The SAC's subgroup on exotic diseases (SAC-ED) was convened to support Defra in the case of avian influenza during November 2014. SAC considered the evidence in relation to the outbreak, and provided assurance to the work that Defra undertook.

Looking forward to the next reporting year, the SAC will continue to support Defra and move to a more strategic role assisting Defra in the process of deciding what evidence it needs, now and in the future, and how it should obtain and use it.

¹ NB. Since the activities covered in this report, the Defra activities on NEAPs have evolved and these documents have developed further and focussed as Evidence Action Plans.

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Foreword by Defra's Chief Scientific Adviser



Evidence is an essential component of policy development and delivery in Defra and science has a major part to play in providing this evidence. This is recognised within Defra's organisational structure. The Chief Scientific Adviser (CSA) occupies a senior position in the management and governance of Defra and the Science Advisory Council (SAC) is an independent body that works with Defra to support the process of evidence delivery. The SAC itself is the senior body among many specialist expert committees and advisory committees that as a group provide considerable support for Defra's activities. I am grateful to all those who generously give their time and expert advice without which I am sure Defra would not function effectively.

As CSA, I am the main route through which this advice travels to achieve impact on Defra's activities. The SAC, in particular, occupies an oversight role that considers strategic issues and helps to provide assurance about how the advisory processes operate. The triennial review of the SAC during this report year has been an opportunity to reflect on the work that the SAC does and modify its ways of working based upon past experience. The review confirmed the importance of the SAC and expressed an ambition to see the SAC's work integrated more effectively in to the operations of the Department while not diminishing the independence of the SAC or its capacity to provide constructive challenge on important issues. Considerable progress has already been made to achieve that objective.

This year has seen a number of changes in the SAC membership. Professor Christopher Gilligan left SAC in May 2014 to become Chair of Defra's Joint Nature Conservation Committee. Prof. Gilligan made an important contribution to the development of SAC by consolidating its position after a major review in 2011, and by providing me with valuable support and challenge. I am delighted that Professor Charles Godfray was selected to become the new SAC Chair starting in January 2015. I would like to thank Professor Peter Liss for stepping in as interim Chair until Prof. Godfray was appointed. I would also like to thank Professor Quintin McKellar, who stood down in December 2014, for his valuable contributions to SAC and, in particular, leading the SAC subgroup on Exotic Diseases.

Finally, I also wish to thank the dedicated team that has supported various aspects of SAC in addition to other duties – namely Claire Hill, Yvette Hood, Chris Jacobs, and Nicky Gee.

Professor Ian Boyd

Foreword by SAC Chair



I took over the role of Chairman of Defra's Science Advisory Council in January 2015. Professor Chris Gilligan, my predecessor, has done an excellent job of chairing SAC and I hope I can build on his substantial achievements.

Science is at the core of more of the decisions Defra makes than perhaps any other Department. Defra invests substantial resources in its evidence teams and the importance it places on science is reflected in the seniority of its Chief Scientific Advisor (who sits on the board). Our role on SAC is both to “roll up our sleeves” and help the Department develop its evidence base, but also from our position outside Government to act as a critical friend and give an external perspective on the present and future challenges facing the organisation.

The Report details the work of SAC over the last year as well describing how we go about our business. SAC has contributed to refining the evidence base underlying policy in food security, resilience and climate change, as well as through a subgroup supporting the Department's response to an avian flu outbreak in late 2014. It has also provided critical challenge to Defra's continuing efforts to optimize its evidence gathering and to help it, and the family of agencies that feed into Defra policy, to work together with maximum efficiency.

Just after my appointment the triennial review of SAC was published. It confirmed that a Non-Departmental Private Body (NDPB) was the appropriate organisational structure and made a series of helpful suggestions, all of which SAC accepts. For example it is important we take a high-level approach spanning all of Defra's evidence needs, on occasion setting up time-limited subgroups or working with other Defra evidence bodies when a deeper dive is required. We must strive to be more visible within Defra, and, without compromising our position as an NDPB, be seen as a resource that can help improve the quality of the evidence base upon which policy is built. All members of SAC are committed to work with Defra's Chief Scientific Adviser to put these recommendations into practice. They are particularly important to implement at a time when Defra must maintain its high standards of the use of evidence with reduced resources.

On behalf of all SAC members it is a pleasure to thank Defra staff, led by the CSA Ian Boyd, for their very constructive engagement with the Council, and the excellent secretariat support provided by Claire Hill and Nicky Gee.

Professor Charles Godfray

Introduction

This is the third Annual Report of the Defra Science Advisory Council (SAC) and covers the period from April 2014 until March 2015.

The Annual Report is produced as part of the Council's policy on openness, as set out in the Government Office for Science's Code of Practice on Scientific Advisory Committees². The report summarises the key activities of SAC during this period. Further detailed information can be found in meeting minutes on the SAC website³.

Overview of SAC

What is SAC?

The Defra Science Advisory Council (SAC) is an Advisory Non-Departmental Public Body (NDPB) sponsored by Defra. It was first set-up in 2004 to challenge and support the Department's Chief Scientific Adviser (CSA) in independently assuring and challenging the evidence underpinning Defra policies and ensuring that the evidence programme meets Defra's needs. The Council communicates its advice to the CSA, and through the CSA to Ministers.

An independent review⁴ and a separate Arm's Length Body (ALB) review led to the establishment of a new model for SAC, implemented at the end of 2011.

Responding to the 2014 triennial review, the Terms of Reference for the SAC have been re-written ([Annex 1](#)). The re-writing reflected the recommendations made in the triennial review including ensuring that SAC's role and remit is more tightly and clearly defined with focus on a strategic role.

Membership

During the reporting period two members departed from SAC. Professor Christopher Gilligan stood down from chairing the SAC at the end of May 2014, in order to take up a new role as Chair of the Joint Nature Conservation Committee (JNCC). Professor Quintin McKellar stood down at the end of his term of appointment (ending December 2014).

² <https://www.gov.uk/government/publications/scientific-advisory-committees-code-of-practice>

³ <https://www.gov.uk/government/organisations/science-advisory-council>

⁴ <http://webarchive.nationalarchives.gov.uk/20130822084033/http://www.defra.gov.uk/sac/files/sac-review-sept-2010.pdf>

Peter Liss, an existing SAC member, was appointed by Lord de Mauley, as interim SAC Chair for a period of six months until the end of December 2014 while a recruitment campaign took place.

Recruitment of a Chair and two members with a sound and broad basis of expertise across natural, economic or social sciences of relevance to Defra's portfolio took place between July and December.

The process was conducted in line with Code of Practice of the Commissioner for Public Appointments (OCPA), which outlines the Commissioner's requirements when making Ministerial appointments to the boards of public bodies. Lord de Mauley decided to appoint Charles Godfray as the Chair and Sheila Bird and Sarah Whatmore as members.

A membership list is at [Annex 2](#).

All SAC members have declared any interests that are relevant to the remit of SAC and these are published on the SAC website⁵.

Triennial Review

The Cabinet Office requires Non-Departmental Public Bodies (NDPBs) to be reviewed every three years by their parent department. This includes a full assessment of the bodies' compliance with the Cabinet Office principles of good corporate governance.

A Triennial Review of Defra's Science Advisory Council (SAC) was launched on 25th March 2014 and Review conclusions were published on 26th March 2015.

The Triennial Review conclusion in relation to SAC's form was that:

- An advisory NPDB is the most appropriate form to deliver SAC's functions, as it is the only model which can deliver these functions independently and transparently, with the right governance, and level of expertise.

The Triennial Review conclusions in relation to SAC's functions were:

- SAC's overarching function is right, and essential to ensuring public trust in Defra's policy process.
- SAC should focus at a high level, across all aspects of Defra's evidence, not on the detail of specific evidence questions.
- SAC's role should include holding to account and supporting Defra's Chief Scientific Adviser (CSA) to assure:

⁵ <http://www.defra.gov.uk/sac/about-us/register-of-interests/>

- that Defra's plans for obtaining evidence effectively meet its needs now and in the future;
 - the quality of Defra's evidence and scientific/technical advice; and
 - the integrity with which Defra presents and uses evidence in policy.
- SAC should have a higher profile in the department.
 - SAC's approach should feel more supportive, particularly to policy teams.

The Triennial Review conclusion in relation to SAC's governance was that:

- Governance arrangements for Defra's SAC are appropriate to the size and functions of an advisory NDPB. However, there is no formal process to assess the SAC's overall performance in delivering its functions, as opposed to the performance of individual members. Defra's CSA should report annually on SAC's performance as set out below.

The Review also made a series of practical recommendations. Defra will be implementing changes to capture the recommendations during the next annual reporting year. The complete report for the 14/15 Triennial Review can be found at:

<https://www.gov.uk/government/publications/science-advisory-council-triennial-review-2014>

Structure of Business

SAC's working practices are detailed in the SAC Handbook⁶, which can be found on the SAC website; primarily it is organised in four ways:

- principal meetings;
- monthly teleconferences;
- subgroups on specific policy/evidence areas; and
- Defra Official and SAC Member pairing scheme.

Defra's Natural Environment and Science Minister met with the SAC Chair on an annual basis, and a key part of their discussion was on SAC's past and future work. The annual meeting with Professor Christopher Gilligan took place on 7th October 2013.

Professor Charles Godfray will meet with the Minister of State for Farming, Food and the Marine Environment during the next reporting year to discuss SAC's work and future direction.

⁶ <https://www.gov.uk/government/publications/science-advisory-council-sac-handbook>

Much of Defra evidence covers both England and Wales, therefore the SAC meetings are attended by a representative of the Welsh Government to utilise the SAC advice and outputs on evidence within the Welsh policy context. As the majority of Defra's evidence budget does not cover Scotland, there is not the same requirement to engage with the Scottish Government. However, Scottish interests are often brought to the discussion through the membership of Professor Louise Heathwaite in the SAC (who is also the Chief Scientific Adviser, Rural Affairs, Food and the Environment for the Scottish Government).

Governance

The SAC handbook⁷ provides guidance on the establishment, management, and activity of SAC and its ongoing relationship with Defra. The SAC handbook is reviewed annually to reflect any changes to working practices that may be required; and was specifically updated in light of the triennial review recommendations.

Monitoring performance of SAC

An annual appraisal of members' and the Chair's performance is conducted in line with recommendations detailed by the Office of the Commissioner for Public Appointments (OCPA) Code of Practice⁸. The SAC appraisals are not aligned with the reporting period covered in this report, and took place in 2014 covering the period 1 July 2013 – 30 June 2014.

⁷ <https://www.gov.uk/government/publications/science-advisory-council-sac-handbook>

⁸ <http://publicappointmentscommissioner.independent.gov.uk/wp-content/uploads/2012/02/Code-of-Practice-20121.pdf>

Summary of SAC discussion topics

The information below summarises the main areas of focus for SAC's discussions from the last annual report until the end of March 2015, these are presented in alphabetical order and do not reflect any prioritisation. Further details may be found in the minutes from SAC quarterly meetings and teleconferences that are available on the SAC website⁹.

The dates of the meetings held during the reporting period are given in [Annex 3](#).

Animal and plant health UK evidence capability assessment

Throughout the reporting year, SAC have been updated on the progress of the joint work between Defra and the Government Office for Science (GO-Science) on the animal and plant health UK evidence capability. The work has been undertaken in response to an identified need for increased integration across the UK to deliver plant and animal health science in support of policy.

SAC have provided feedback on governance plans, and terminology to better communicate plans to a wider audience. Additional involvement with the work has been through SAC member Louise Heathwaite's membership of first the Steering Group and subsequently the Implementation Group for the project.

The output of the work undertaken by Defra and GO-Science was a report entitled 'Animal and Plant Health in the UK – Building our Science Capability'. The recommendations from the report are about building a partnership approach to future planning of plant and animal health evidence. It is proposed that the Defra SAC and science advisory councils from the devolved administrations provide independent advice to the Implementation Group which continues to oversee this work. SAC have agreed to undertake this role, the detailed arrangements to be discussed in the next reporting period.

Climate Change Risk Assessment

In response to a request from the Adaptation Sub-Committee (ASC), SAC provided views on the proposed methodology for the second Climate Change Risk Assessment (CCRA2) Evidence Report to Lord Krebs (ASC Chair) and Professor Arnell (Chair of the peer-review panel for the CCRA Evidence Report).

The SAC sent a letter (October 2014) to Lord Krebs and Prof. Arnell in which they commented that the ambition of the report is excellent and goes beyond that attempted by

⁹ <https://www.gov.uk/government/organisations/science-advisory-council>

the first Climate Change Risk Assessment (CCRA1). However, while recognising the current financial conditions and the limited budget available, SAC has reservations whether the funding available will be sufficient to deliver what is required.

The ASC advised that SAC's detailed comments will be taken into consideration. All comments and responses have now been published online in the ASC's [comments log](#), alongside the current version of the CCRA Evidence Report [methodology](#). Defra's CSA and climate change adaptation team both highly valued the SAC's independent, expert review, which has influenced the methodology for this statutory national risk assessment.

Evidence Strategy

Throughout the reporting year, SAC continued to be engaged with Defra's overall Evidence Strategy providing comments and support for the Strategy's development.

SAC's engagement with the implementation of the Evidence Strategy included the One Business Evidence project (designed to improve the way colleagues across the Defra Network achieve common evidence goals); and the new Network Evidence Actions Plans (NEAPs). The NEAPs will detail Defra's evidence requirements summarising what we already know; what we need to know; evidence needs and priorities; what evidence needs are being addressed by external partners; and how current evidence commitments will meet priority needs. SAC agreed to perform an assurance role for the NEAPs, and provide an outside perspective to the drafts. This role will be undertaken in the next reporting period.

Evidence needs

In Spring 2015 a new annual meeting was introduced that aimed to:

- i) provide SAC with a broad and wide overview of the landscape of Defra evidence needs in order to equip SAC to fulfil their horizon scanning role; and
- ii) give Evidence DDs some early feedback from SAC on their evidence plans.

SAC noted a number of common issues where Defra may benefit from sharing best practice across different areas:

- the design of monitoring schemes, particularly where statutory obligations place constraints on the deployment of scarce resource;
- the use of systems thinking, especially in topics that cut across different policy areas;
- data access and availability and the potential to stimulate collection or use of data collected by non-government organisations, industry and citizen scientists; and
- research capability and future partnerships. The landscape of evidence providers and evidence provision is changing and therefore Defra will not always be able to rely on its traditional mechanisms of obtaining information, nor its traditional sources of knowledge. It is likely that Defra will increasingly work more closely with academic and expert groups to obtain the evidence it needs.

SAC also emphasised the importance continuing to break down silos in evidence collection relating terrestrial and aquatic systems.

Potential roles for SAC in further supporting Defra evidence provision were identified that will be explored in the next reporting year.

Food

The SAC identified a need to understand Defra food policy and evidence activity in relation to food chain competitiveness, growth, resilience, sustainability, standards, and food information to the consumer. A meeting (April 2014) was held with the aim to determine whether any areas of evidence would benefit from further SAC engagement and explore what format this engagement should take.

The briefing that Defra provided assured SAC on the food evidence activities that were being undertaken. In response to this briefing, SAC provided Defra with a note that detailed their suggestions and ideas. Defra used this input from SAC to help develop a more integrated approach to farming and food evidence resulting in a Food and Farming NEAP, and joined up activity with Research Councils on resilience (<http://www.foodsecurity.ac.uk/news-events/news/2015/150529-n-gfs-develops-new-funding-programme.html>).

Recognising food supply as an important issue with scope for significant impacts, SAC supported Defra's proposal to Cabinet Office that it be included in the National Security Risk Assessment. Defra proposed two food supply risks: disruptions to UK domestic food supply (milk); and disruptions to UK imported food supply (east coast ports). These were included in the final version of the NSRA, which has now gone through the final stages of clearance.

Hazardous Substances Advisory Committee's (HSAC) report on quality standards for evidence

SAC has provided peer review and support for a report produced by HSAC on its procedures for dealing with different types of evidence (from controlled experiments through systematic to casual observations). SAC noted that the HSAC report was a positive initiative and that HSAC should be congratulated on its production. SAC considered that with further development the report could be a valuable guide in decision making. HSAC intends to publish the report, having taken further account of SAC's comments, with the aim of encouraging input from a wider audience.

Longer term issues

During the year, SAC looked at a couple of issues that are of longer-term consideration for Defra.

Taxonomy – capacity issue

The issue about whether there is sufficient capacity in the research community has been previously raised by the Natural Environmental Research Council (NERC) in their 2011 report 'Developing a National Strategy in Taxonomy and Systematics'. SAC were asked whether Defra, as a user of taxonomy and systematics expertise, should engage with this issue. SAC suggested that any discussions about this issue would be best approached by considering taxonomy as a set of tools that could be applied to different areas (e.g. plants, animals, pests). However, SAC considered that the Research Councils should take the lead on the provision of taxonomic skills.

Ownership structure for Defra Executive Agencies

SAC was briefed throughout the year on changes to the structure of Defra Executive Agencies that were being considered.

Science Advisory Groups

Relating to SAC's role in supporting the CSA in oversight of science/expert groups, SAC has been updated throughout the year on activities to review the existing science advisory / expert groups that exist in Defra. In turn, SAC has provided comments and suggestions for Defra to consider.

Not all areas of Defra's evidence needs are covered by specific science advisory committees and SAC noted that gaps were covered in advice provided in other ways. For example, from Natural England or the Joint Nature Conservation Council, or informally through research contracts and fellowships.

The CSA proposed that SAC could assist in the CSA role of overseeing the operation and governance of science advisory committees to ensure appropriate standards were in place. Work to implement this is ongoing and will be reported on in the next reporting period.

Shale gas

Defra officials provided SAC with a summary of Defra's role in the wider context noting that: the Department for Energy and Climate Change (DECC) is the lead Government department in relation to shale gas policy; the Department for Business, Industry and Science (BIS) has a role in relation to supply chain activities, and technological innovation; and the Environment Agency (EA) undertakes environmental monitoring in relation to shale gas, has a lot of expertise in data gathering, and is responsible for permitting.

Discussion centred on raising SAC's awareness of the interaction between the different Government organisations involved in shale gas, and the evidence that is being produced and maybe needed in the future.

Triennial review

The SAC were kept up to date on the activities of the triennial of the SAC, given the opportunity to input to the consultation, and advised of its publication in March 2015. After publication of the triennial review report, the SAC Secretariat produced plans for actions to be taken to respond to the recommendations. These, as given below, were agreed with SAC.

Action 1: New Terms of Reference will be written; including a requirement for the SAC to define, on a yearly basis, key outcomes against which its performance can be measured.

Action 2: Ensure appropriate links are in place with the devolved administrations including sharing agendas and standing open invitations to join where appropriate.

Action 3: Organise annual reporting to Defra's Executive Committee, the Science Minister and Government CSA. In addition to the existing annual meeting between the SAC Chair and Science Minister, a meeting half way through the reporting year will be scheduled to review progress to date.

Action 4: Review the role of SAC in emergency situations and clearly define the role in the SAC Handbook.

Action 5: Review and address the relationship between SAC and other Defra evidence committees including creating better links to share thinking about common topics.

Actions 6: Review how SAC contributes to Defra's horizon scanning

Action 7: Review and revise the SAC Handbook to ensure that it is in line with the recommendations of the triennial review and subsequent changes to ways of working of the SAC.

Action 8: Annual meeting/workshop to provide overview of all Defra evidence with the aim of providing SAC with a broad and wide overview of the landscape of Defra evidence needs in order to equip SAC to fulfil their horizon scanning role; and give Evidence DDs some early feedback from SAC on their evidence plans.

Action 9: Better use is made of the pairing scheme to include using the Defra half of the pair to make policy directors more aware of the SAC, and improve the links between SAC and other evidence advisory committees.

Action 10: SAC members to present at Evidence Forum lunchtime seminars to raise the profile of the SAC members themselves and their expertise.

Action 11: Standing agenda item on 'emerging issues' to be added to all quarterly SAC meetings

SAC subgroups

Background information

It was agreed that SAC would establish time-limited sub-groups in relation to emergencies, or to focus in more detail on a specific issue (further information about subgroup formation can be found in the SAC Handbook¹⁰).

Exotic Diseases Sub-Group (SAC-ED)

In partnership with Defra's Chief Veterinary Officer (CVO), SAC has a standing subgroup on exotic disease (SAC-ED) to give oversight and assurance for dealing with animal exotic disease outbreaks. SAC-ED's terms of reference and details of SAC-ED membership can be found in previous annual reports, noting that Quintin McKellar retired from SAC and SAC-ED in December 2014.

SAC-ED was convened in November 2014 to consider the evidence in relation to the outbreak of H5N8 avian influenza (AI). In addition to the existing SAC-ED members, the following co-optees joined the meeting to provide additional expertise:

- Nigel Clark, British Trust for Ornithology, Head of Projects;
- Rob Fraser, Professor of Agricultural Economics, University of Kent;
- Steven Hinchcliffe, Professor of Human Geography, University of Exeter; and
- Mark Woolhouse, Professor of Infectious Disease Epidemiology, University of Edinburgh

SAC-ED was provided with a range of evidence from Defra and APHA officials; and overall was impressed by the quantity and quality of work that has been undertaken in response to the outbreak. SAC-ED was entirely satisfied that Defra was actively seeking scientific input and was managing the outbreak according to the available scientific evidence. SAC-ED provided a number of suggestions for activities in the short and long term to improve evidence in relation to both the current case of AI and any future outbreaks.

The SAC-ED report and the Defra response can be found at:

<https://www.gov.uk/government/publications/reports-relating-to-recent-cases-of-avian-influenza-bird-flu>

¹⁰ <https://www.gov.uk/government/publications/science-advisory-council-sac-handbook>

Other SAC activities

Emerging issues

In response to a recommendation from the triennial review, SAC principal meeting agendas will have a standing agenda item entitled 'emerging issues', during which SAC members will bring to Defra items for consideration from their wider networks. The first time this was implemented was the January 2015 principal meeting. Details of the items SAC raised can be found in the SAC meeting minute. These suggestions have been taken to Defra officials and the Defra horizon scanning team for consideration, and will be reported on in the next reporting period.

Quarterly updates

As part of activities to raise the profile of SAC within Defra; the SAC Secretariat, with the support and input of the SAC members, has begun creating quarterly updates to be shared with senior Defra officials. The quarterly update provides key highlights from SAC activities over the preceding three months alongside background information about the SAC.

Pairing Scheme

Details of the purpose of the SAC – Defra official pairing scheme can be found in the SAC Handbook¹¹. During this reporting period the SAC members were paired as below:

SAC member	Defra official
Ian Bateman	Evidence Deputy Director for Rural Development, Sustainable Communities & Crops; and Sustainable Land Management and Livestock Farming (job shared with another Evidence Deputy Director)
	Chief Economist
Sheila Bird	Evidence Deputy Director for Rural Development, Sustainable Communities & Crops; and Sustainable Land Management and Livestock Farming (job shared with another Evidence Deputy Director)
Charles Godfray	Chief Scientific Adviser
Louise Heathwaite	Evidence Deputy Director for Water and flood risk management
Peter Liss	Evidence Deputy Director for Resource, Atmosphere and Sustainability

¹¹ <https://www.gov.uk/government/publications/science-advisory-council-sac-handbook>

SAC member	Defra official
Judith Petts	Evidence Deputy Director for Animal Health and Welfare (Disease Control); and Animal Health: Surveillance, Global Trade and Zoonoses
Lynda Warren	Evidence Deputy Director for Marine and fisheries
Sarah Whatmore	Evidence Deputy Director for Food and Environmental Risk

SAC member activities

SAC members have been asked to be engaged in other Defra activities beyond the core of SAC activities.

Professor Ian Bateman

Professor Bateman organised, chaired and participated in the Nexus Network Workshop on Decision Making at the Energy-Food-Water-Environment Nexus (<http://www.thenexusnetwork.org/>), which featured talks from senior Defra officials and business leaders from the Water Sector and researchers, held in Defra. Due to its success, a second workshop, aimed at practical decision making methodology was held with Defra, Natural England, Environment Agency and other Government bodies in Defra, April 2015.

Professor Ian Bateman has also provided a link between Defra SAC and the Natural Capital Committee on which he is also a member and updated SAC on NCC activities including its Annual State of Natural Capital Report and associated 25 Year Plan for Restoring Natural Capital.

Aside from SAC and Natural Capital Committee activities, Ian also:

- held meetings with various groups in Defra on the natural capital theme;
- presented a talk to the Defra/FC/others Woodland Carbon Code Taskforce and held meetings with the Defra Peatlands Group;
- presented a paper on the Defra funded UK-NEAFO work at the Royal Society EnvEcon Conference;
- joined the Board of the Joint Nature Conservation Committee providing a link between Defra SAC and JNCC.

Professor Sheila Bird

Sheila Bird met her Defra Pair in March; during which various statistical issues were discussed, including:

- work underlying the publication of statistical series and the design of ad hoc special studies, some of which may inform how future monitoring statistics should be defined; and
- statistical monitoring, defined in legislation or by regulations, and the problems faced if the monitoring so-defined is not robust, poorly informative or under-analysed on an international basis.

Sheila has offered to critically review, from an independent statistical stand-point, up to three selected monitoring set-ups as examples of 'imposed' monitoring but which are costly or otherwise of concern because their statistical credentials are weak.

Professor Louise Heathwaite

Louise Heathwaite meets regularly with her Defra pair, Fiona Harrison, Defra Deputy CSA covering both the broader role of the Deputy CSA and more specifically issues relating to water and the environment.

Louise continues to work on the GO-Science Animal and Plant Health in the UK project as a member of the implementation group.

Professor Peter Liss

In addition to continuing with his Defra pair, during most of this reporting period Peter Liss dedicated his time to his role as interim Chair. Meetings he attended in this capacity are detailed below.

Professor Judith Petts

As part of her SAC duties, Professor Judith Petts has continued for the second year as an independent Chair to the Defra and Department of Energy and Climate Change (DECC) Social Science Expert Panel (SSEP). Further information about the SSEP and their activities can be found in the SAC annual report April 2012 – March 2013 and the SSEP Annual Report (April 2013-March 2014).

She is also a member of the Defra Sustainable Intensification Platform Research Advisory Group.

Professor Lynda Warren

Participated in workshop discussions on the Role of Science in Environmental Legislation, chaired by Professor Boyd, building on the Smarter Environmental Legislation Review.

Professor Sarah Whatmore

Participated in the planning and development of a British Academy Public Dialogue programme (in collaboration with the Office of the GCSA) on the theme of 'Energy and Environment'.

Member of the Social Science Expert Panel (Defra/DECC) and co-author of paper on improving the use of qualitative social research data in the Defra environmental evidence base (Environmental Evidence Journal).

Aside from SAC and SSEP, Sarah is working with the Defra Food and Farming Directorate on the development of their NEAP and a research partnership application to ESRC.

Meetings attended by the SAC Chair

The SAC Chair represents SAC at the Government Chief Scientific Adviser's (GCSA) quarterly meetings with Chairs of SACs and Chief Scientific Advisers (CSAs). These meetings are an opportunity to be briefed by the GCSA on new developments and emerging cross-cutting policy issues. SAC Chairs and CSAs may also raise matters and several of the issues listed in the body of this report have been discussed.

In addition, the SAC Chair has attended a number of meetings in capacity as SAC Chair in order to make wider links for SAC and obtain information of relevance to SAC's activities, as detailed below.

Professor Chris Gilligan

There were no additional meetings during April-May 2014 which required Prof. Gilligan's attendance.

Professor Peter Liss (interim)

During his time as interim Chair Peter attended two meetings:

- A meeting of Chairs of Defra's advisory bodies (organised by Defra's public appointments team).
- Participated in workshop discussions on the Role of Science in Environmental Legislation, chaired by Professor Boyd, building on the Smarter Environmental Legislation Review.

Professor Charles Godfray

Following Professor Godfray's appointment as the SAC Chair in January 2015, he has undertaken a range of activities including:

- met with the Permanent Secretary as part of his introduction to Defra's ways of working and to discuss the work of the SAC;
- participated in the annual meeting of the CSA and Chair of the Social Science Expert Panel;
- attended a Ministerial Emerging Technology seminar on Satellites and Agri-Tech at the Cabinet Office; and
- participated in a workshop convened by Sir Mark Walport and Chris Wormald (Head of Whitehall policy profession) for CSAs and the Chairs of Departmental Science

Advisory Councils. The event used horizon-scanning approaches to take a shared, big-picture look at the future of science advice over the mid to long-term, from both supply and demand perspectives. The meeting considered this in the context of developments in approaches to evidence underpinning government policy making.

Defra Expert Scientific Committees

In accordance with the recommendations of the independent review of SAC and the Arm's Length Body (ALB) review, the Defra CSA has oversight of all six Defra expert scientific committees, and SAC supports and challenges the CSA in this role. The CSA has an annual meeting with the Chairs of each of the expert scientific committees.

- **Air Quality Expert Group (AQEG)** provides independent scientific advice on air quality. Further information about AQEG can be found at: <http://uk-air.defra.gov.uk/library/aqeg/>.
- **The Darwin Expert Committee (DEC)** assesses project applications under [The Darwin Initiative](#). Further information about the Darwin Expert Committee can be found at: <https://www.gov.uk/government/groups/the-darwin-initiative#darwin-expert-committee>
- **The Farm Animal Genetic Resources Committee (FAnGR)** provides advice on all issues relating to farm animal genetic resources particularly its conservation and sustainable use. Further Information about the FanGR Committee's activities can be found at <https://www.gov.uk/government/groups/farm-animal-genetic-resources-committee-fangr>
- **The Farm Animal Welfare Committee (FAWC)** provides advice on the welfare of farmed animals, including farmed animals on agricultural land, at market, in transit and at the place of slaughter. Information about FAWC's recent advice and current activities can be found at: <https://www.gov.uk/government/groups/farm-animal-welfare-committee-fawc>
- **The Hazardous Substances Advisory Committee (HSAC)** provides advice on matters relating to the protection of the environment, and human health via the environment, from potentially hazardous substances and articles. Further information can be found at: <https://www.gov.uk/government/policy-advisory-groups/hazardous-substances-advisory-committee>
- **The Pesticides Residues in Food Committee (PRiF)** provides advice on the planning of surveillance programmes for pesticide residues in the UK food supply; the evaluation of the results; procedures for sampling and sample processing and new methods of analysis. Further information about PRiF can be found at: <http://www.pesticides.gov.uk/guidance/industries/pesticides/advisory-groups/PRiF>

Resources and Expenditure

The Defra SAC is an independent SAC but does not have resources of its own. The activities of the Council are funded by Defra; and information on the fee rates and expenses guidance can be found in the SAC member's handbook¹². Table 1, below, summarises how the budget for SAC has been spent in financial year (2014-15). A total of £14.9K was spent on activities in 2014-15 compared to £26.9K in 2013-14 and £31.2K in 2012-13. The Secretariat has actively worked to ensure that venues for meetings offer the best rates available and has worked with SAC to ensure that cost-saving options are chosen whenever possible.

Table 1: SAC expenses (Financial year 2014-15)

	Member fees	Member travel and subsistence expenses	Other expenses (as defined by footnote)
Principal SAC meetings	£6.0 K	£1.4K	£1.4K ¹³
Monthly SAC teleconferences	£1.3K	N/A	N/A
Subgroup activities	£0.3K	£0.6K	N/A
Additional SAC member activities ¹⁴	£1.0K	£0.4K	£2.5K ¹⁵
Total Expenditure	£8.6K	£2.4K	£3.9K

¹² <https://www.gov.uk/government/publications/science-advisory-council-sac-handbook>

¹³ Expenditure associated with meeting arrangement costs, including refreshment provision.

¹⁴ SAC members' attendance at: food briefing meeting, environmental legislation meeting, and Defra SAC pairing scheme activities. Activities of the Chair (House of Commons Science and Technology Committee evidence session (accounted for in the last report, but costs fell within the 14/15 annual reporting period), CSA and SAC Chair meetings, and Chair attendance at a Public Appointment meeting.

¹⁵ Cost of the 2014 Chair and member recruitment: Fees associated with engaging an Independent Assessor (a mandatory requirement) and reimbursement of attendee interview costs. Also, meeting costs, including refreshment provision, associated with food briefing meeting.

Contact for further information

Further information about the Defra SAC can be found at:

<https://www.gov.uk/government/organisations/science-advisory-council>

or by contacting the SAC Secretariat:

SAC Secretary
Defra
Area 2C, Nobel House
17 Smith Square
London
SW1P 3JR

Email: science.advisory.council@defra.gsi.gov.uk

Annex 1: Terms of Reference of the Defra SAC

Terms of Reference until March 2015

1. Defra's Science Advisory Council (SAC) is an advisory Non-Departmental Public Body sponsored by the Secretary of State. Lord de Mauley will act as the lead Minister accountable for SAC, and will:

- set terms of reference for the Council and make appointments to it;
- agree strategic work plans, receive reports and advice;
- receive periodic reviews of the Council's functions and value for money; and
- consult other Departments as appropriate about the Council and its work.

2. SAC will challenge and support the Department's Chief Scientific Adviser (CSA) in independently assuring and challenging the evidence underpinning Defra policies and ensuring that the evidence programme meets Defra's needs. In doing so SAC will:

- review, on a rolling basis, the evidence plans put in place to support policy programmes, and identify any gaps in Defra's science or evidence base at present or likely in the foreseeable future;
- provide advice, when asked or on their own initiative, in emergency situations;
- respond to requests for, or provide on their own initiative, ad hoc advice on broad strategic and cross-cutting issues (relating to the use of science or evidence) facing the Department;
- identify and publish advice on substantial strategic and cross-cutting issues of Government-wide as well as Defra concern;
- contribute, as required, to the CSA's quarterly reports to the Defra Supervisory Board;
- support and challenge the CSA in his oversight role with respect to other scientific expert committees of Defra, and include annual updates on the work of such committees in the SAC Annual Report; and
- via the CSA, ensure the Defra lead Minister receives the highest quality advice.

3. SAC will achieve this by:

- horizon scanning, and planning and publishing an annual programme of work that best challenges and serves the CSA and the needs of the Department;
- co-opting experts to time limited sub-groups, chaired by a SAC Member, to review Departmental evidence plans or other cross-cutting or strategic issues. Subgroup reports and recommendations will be reviewed and adopted by SAC, forwarded to the CSA, to help him advise Defra, and published;
- working with the CSA to respond to GO-Science or other Government-wide policy initiatives or consultations, as appropriate;
- via the CSA and the SAC Chair, maintaining links with the Government Chief Scientific Adviser (GCSA) and other departmental SAC Chairs;
- maintaining and developing links with Research Councils, other scientific institutions and the Devolved Administrations to further the work, aims and objectives of SAC;
- publishing an Annual Report;
- re-reviewing evidence programmes that have previously been subject to SAC's scrutiny where appropriate, and publishing new advice if necessary;
- contributing to reviews of science bodies within the Defra network as required;
- maintaining open lines of communication with Defra, the CSA and its Ministers; and
- operating in line with the Government's Principles for Scientific Advice and the Code of Practice for Scientific Advisory Committees.

4. In line with the Commissioner for Public Appointments Code of Practice an annual appraisal of members' performance will be conducted.

Terms of Reference implemented from March 2015

Aim of the Council

The Science Advisory Council (SAC) is a Non Departmental Public Body (NDPB) which provides independent and scientific support, advice and challenge to Defra. The SAC will assist the Defra Chief Scientific Adviser (CSA) in assuring and challenging the evidence that Defra uses in its policy development.

Objectives of the Council

The objectives of the SAC are to:

- advise and support Defra on developing and implementing an effective and efficient strategy for obtaining and using evidence and scientific advice;
- advise on and provide assurance on the process for evidence gathering;
- provide strategic oversight and assurance on how evidence is used in policy, providing targeted support where necessary;
- provide constructive challenge on Defra's evidence; and
- identify sources of additional expert external advice to input to Defra evidence.

At the beginning of each reporting year (April), the SAC Chair and CSA will agree the key tasks/outcomes that the SAC will undertake to meet these objectives for the following year. This tasks/outcome document will be maintained under review throughout the year.

Responsibility for the Council

The Science Minister will act as the lead Minister overseeing SACs work; and will meet the SAC Chair twice a year.

SAC will report to the CSA on a routine working basis, who in turn will report to the Defra Board on SAC activities. In addition, the CSA will report annually to the Network Executive Committee and to the Government CSA on SAC's work, results and performance.

Role of the Council in an emergency situation

In the event of an emergency, the Council will act in accordance with Cabinet Office guidance on Scientific Advisory Group for Emergencies (SAGE). The role of the Council in

an emergency situation is defined in a separate document (found on the SAC website), which is reviewed after each emergency situation and updated as necessary.




Ways of Working

The Defra SAC operates in accordance with the Government Office for Science's Code of Practice on Scientific Advisory Committees. The Defra SAC Handbook provides specific details on the SAC's ways of working including (but not limited to):



- responsibilities of the Chair and Members
- register of interests, and conflicts of interest
- information about liability of members
- appointments and membership
- the role of the Council Secretariat
- sub-group formation and role
- communications (with media, public and Ministers)
- how SAC outputs are formulated and presented


Annex 2: Membership of the Defra SAC

Presented in alphabetical order

Name	Biography
<p>Professor Ian Bateman (1 August 2011 – 31 January 2016)</p> 	<p>Professor Bateman is Professor of Environmental Economics and Director of the Centre for Social and Economic Research on the Global Environment at the University of East Anglia. His main research interests are integrated environmental and economic modelling for decision making. He is a member of the UK Natural Capital Committee (NCC), the Joint Nature Conservation Committee, the NERC Strategic Programme Advisory Group, the BBSRC working group on Sustainable Intensification of Agriculture and led the economics team for the UK National Ecosystem Assessment.</p>
<p>Professor Sheila Bird (1 January 2015 – 31 December 2017)</p> 	<p>Sheila Bird is Programme Leader at the MRC Biostatistics Unit, Institute of Public Health, Cambridge and visiting professor at the University of Strathclyde's Department of Mathematics and Statistics. She has been a Medicines Commissioner, was the first statistician on NICE's Appraisal Committee, and has served on four Royal Statistical Society Working Parties as well as on various Medical Research Council, UK government and EU Working Parties and Groups. Bird has given oral evidence to the Science and Technology Select Committee Inquiries into Scientific Advice in Emergencies and to its recent inquiry into the safety of blood, tissue and organ screening. Her research interests include UK dietary exposure to BSE, autopsy surveillance for carriage of subclinical variant CJD, record-linkage studies and the application to statistical methods at the interface of public health and other jurisdictions, including to the criminal justice system's treatment of drug-dependent offenders.</p>
<p>Professor Chris Gilligan, Chair (1 August 2011 – 31 May 2014)</p> 	<p>Professor Gilligan is Head of the School of Biological Sciences and Professor of Mathematical Biology, University of Cambridge. He also holds Professorial Fellowship at King's College and is Head of the Epidemiology and Modelling Group in the Department of Plant Sciences. His research has developed and tested a suite of models to predict invasion persistence and control of botanical epidemics in agricultural and natural environments.</p>

Name	Biography
<p>Professor Charles Godfray, Chair (1 January 2015 – 31 December 2017)</p> 	<p>Charles Godfray is Hope Professor in the Zoology Department and Director of the Oxford Martin Programme on the Future of Food at the University of Oxford. Prior to moving to Oxford in 2006 he worked for 20 years at Imperial College, latterly as head of Biology and director of the NERC Centre for Population Biology. He is a population biologist with research interests including ecology, epidemiology and evolutionary biology. He is very interested in the interplay of science and policy and co-leads the "Restatement" initiative at Oxford which aims to define the natural science evidence base in contentious areas of policy importance. He served as chair of the Lead Expert Group of the Foresight Project on the Future of Food and was a member of the steering group of Defra's Green Food Project. He has been President of the British Ecological Society and a Trustee of the Royal Botanic Gardens, Kew. Currently he is a member of NERC Council, a Trustee Director of Rothamsted Research, and on the steering group of the UK's Global Food Security programme. He is a Fellow of the Royal Society and a Foreign Member of the American Academy of Arts & Sciences.</p>
<p>Professor Louise Heathwaite (1 August 2011 – 31 January 2016)</p> 	<p>Professor Heathwaite is Co-Director of the Centre for Sustainable Water Management in the Lancaster Environment Centre, Lancaster University. She also works part-time as a science champion for the Natural Environment Research Council (NERC) as Theme Leader for the Sustainable Use of Natural Resources theme. Her research expertise is in land and water systems science. She has over 25 years research experience in diffuse nutrient pollution, wetland hydrochemistry, and water quality. Her applied research interests cut across the environmental sciences to interface with social science and economics.</p>
<p>Professor Peter Liss (1 August 2011 – 31 January 2016) (Interim Chair: 1 June – 31st December 2014)</p> 	<p>Professor Peter Liss is a Professorial Fellow in the School of Environmental Sciences at the University of East Anglia. His research interests are in ocean-atmosphere interaction particularly involving trace gases. He served as chairman of the International Geosphere-Biosphere Programme (IGBP) for 5 years and was subsequently Chair of its Surface Ocean – Lower Atmosphere Study (SOLAS). He is a Fellow of the Royal Society.</p>

Name	Biography
<p>Professor Quintin McKellar (1 August 2011 – 31 December 2014)</p> 	<p>Professor McKellar is Vice-Chancellor at the University of Hertfordshire. He was previously Principal of the Royal Veterinary College, University of London. His research interests are in the pharmacology of anti-infective and anti-inflammatory drugs in domestic animals. He has been a member of the Biological and Biotechnological Research Council, the Government's Veterinary Products Committee, Special Advisory Committee on Antimicrobial Resistance, Regulatory Agency Strategy Board, and Chairman of its Scientific Advisory Committee on Bovine Tuberculosis. He is currently chair of the Pirbright Institute Trustees Board as well as a Non-Executive Director of the Animal Health and Veterinary Laboratories Agency.</p>
<p>Professor Judith Petts (1 August 2011 – 31 January 2016)</p> 	<p>Professor Petts is Pro-Vice-Chancellor (Research and Enterprise), University of Southampton. Her research has focused on environmental risk governance and response to environmental and health hazards in areas such as climate change, energy, waste management, land contamination, natural hazards, and health and wellbeing. Professor Petts holds two other Ministerial appointments as a member of BBSRC Council and Chair of Sciencewise Expert Resource Centre Steering Group. She is also a member of NERC Innovation Advisory Panel.</p>
<p>Professor Lynda Warren (1 August 2011 – 31 January 2016)</p> 	<p>Professor Warren is Emeritus Professor of Environmental Law at Aberystwyth University. Her research interests centre on how law and science are used in developing and implementing environmental policy, focusing on three main areas – radioactive waste management, nature conservation and integrated marine and coastal management. Professor Warren has held a number of Ministerial appointments including Member of the Environment Agency, Member of the Countryside Council for Wales, Deputy Chair of the Joint Nature Conservation Committee and Chair (honorary) of the Wales Coastal and Maritime Partnership. She is currently a Member of the Committee on Radioactive Waste Management, and Natural Resources Wales in which capacity she is also a member of the Joint Nature Conservation Committee.</p>

Name	Biography
<p data-bbox="150 286 576 405">Professor Sarah Whatmore (1 January 2015 – 31 December 2017)</p> 	<p data-bbox="683 241 1441 810">Professor Whatmore is Professor of Environment and Public Policy at the University of Oxford. She holds a Professorial Fellowship at Keble College and is Head of the School of Geography and the Environment (2012-2015). Her research addresses the relationship between science and democracy and is concerned particularly with the nature and role of expert knowledge in the management of environmental resources and risks, including those relating to water, food and biodiversity. Much of her work has involved the design and conduct of interdisciplinary research collaborations with natural scientists and concerned citizens to better understand the ways in which environmental expertise informs policy-making, the conditions in which it is liable to spark public controversy and the lessons for effective environmental governance. She is an elected Fellow of the British Academy and the Academy of Social Sciences.</p>

Annex 3: Dates of SAC meetings during reporting period

15th April 2014 – Teleconference

19th May 2014 – Teleconference

10th June 2014 – Principal meeting

31st July 2014 – Teleconference

17th September 2014 – Principal meeting

14th October 2014 – Teleconference

11th November 2014 – Teleconference

16th December 2014 – Teleconference

15th January 2015 – Principal Principle meeting

10th March 2015 – Teleconference

17th March 2015 – Principal meeting