Response from the Royal Society of Biology (RSB) to the Defra Land Use Consultation

About the RSB response: All questions are shown below as they appear on the consultation document. Where the RSB has responded to a question, this has been highlighted in blue text. This document includes responses to questions 4, 5, 6, 7, 8, 9, 10, 12, 14, 17, 18, 19, 21, 22 and 23. Questions to which we have not responded are shown in grey text.

The Royal Society of Biology (RSB) is a single unified voice, representing a diverse membership of individuals, learned societies and other organisations[1]. Our world-leading biosciences sector contributes strongly to the economy, and to society. We are committed to ensuring that we provide Government and other policymakers, including funders of biological education and research, with a distinct point of access to authoritative, independent, and evidence-based opinion, representative of the widest range of bioscience disciplines.

The RSB welcomes the Government's consultation on land use in England, and we are pleased to provide comments informed by our membership of individuals and organisations with expert interests across the biosciences.

QUESTION 1: To what extent do you agree or disagree with our assessment of the scale and type of land use change needed, as set out in this consultation and the Analytical Annex?

[Strongly agree / Agree / Neither agree nor disagree / Disagree / Strongly disagree / I don't know]

Please explain your response, including your views on the potential scale of change and the type of change needed, including any specific types of change.

QUESTION 2: Do you agree or disagree with the land use principles proposed?

[Strongly agree / Agree / Neither agree nor disagree / Disagree / Strongly disagree / I don't know]

Please provide any reasons for your response including any changes you believe should be made.

QUESTION 3: Beyond Government departments in England, which other decision makers do you think would benefit from applying these principles?

- Combined and local authorities (including local planning authorities)
- Landowners and land managers (including environmental and heritage groups)
- Others (please specify)

[1] A list of RSB Member Organisations is available on our website

QUESTION 4: What are the policies, incentives and other changes that are needed to support decision makers in the agricultural sector to deliver this scale of land use change, while considering the importance of food production?

Legislation such as the Genetic Technology (Precision Breeding) Act is needed to ensure the sustainability and longevity of food security in the UK, through increased resilience and productivity of agricultural crops. This will be critical to achieve this scale of land use change whilst maintaining current levels of domestic food production, and would reduce reliance on artificial fertilisers and the associated economic and environmental costs of these[2]. Regulations need to be proportionate, scientifically-justified, and consistent, and the potential benefits and costs of action or lack of action, as a result of precaution, should be considered[3].

Incentives to attract and retain new entrants to the agriculture, horticulture, and agroforestry workforce are needed. It is essential that the new and current workforce is appropriately trained with the skills and competencies that may be required to manage new technologies and approaches to land use, as well as managing shifting policy and environmental changes[4]. This includes addressing skills gaps in areas previously identified by Government such as the horticulture sector[5] and areas such as Ecology, which will be needed to meet goals proposed in the Planning and Infrastructure Bill[6].

QUESTION 5: How could Government support more land managers to implement multifunctional land uses that deliver a wider range of benefits, such as agroforestry systems with trees within pasture or arable fields?

Appropriate skills and knowledge training to communicate the benefits provided by different practices would lead to greater uptake and support of these. Demonstration processes can be useful in showcasing new and emerging technologies to land managers to highlight their effectiveness in a real world context, provided they are conducted effectively[7]. Increasing support for knowledge sharing and advisory networks can help remove perceived barriers to implementation of new practices, as well as better demonstrate their viability[8].

A systems thinking approach is needed for effective multifunctional land use practises. An example of this is hedgerows, where both educational and financial support should be given to highlight and maximise the benefits these provide in areas such as biodiversity restoration

[2] UK POSTnote, 2024: The future of fertiliser use

[3] Royal Society of Biology, 2024: Letter from the Royal Society of Biology to the Food Standards Agency regarding the proposals for a new framework in England for the regulation of precision bred organisms used for food and animal feed

[4] Nye, C. & Lobley. M. (2023). Future business leaders in agriculture: Who will lead the industry forward? A report for the Worshipful Company of Farmers

[5] House of Lords Horticultural Select Committee, 2023: Sowing the seeds: A blooming English horticultural sector

[6] UK Parliament: Planning and Infrastructure Bill

[7] Sutherland, L. A., & Marchand, F., 2021: On-farm demonstration: enabling peer-to-peer learning. *The Journal of Agricultural Education and Extension*

[8] Hurley, P.D., Rose, D.C., Burgess., P.J., Staley, J.T., 2023: Barriers and Enablers to Uptake of Agroecological and Regenerative Practices, and Stakeholder Views towards 'Living Labs'. Report from the "Evaluating the productivity, environmental sustainability and wider impacts of agroecological compared to conventional farming systems"

and carbon sequestration[9], whilst also making land managers aware of the management systems that may reduce the risks of disease spread through vectors such as cut hedgerow material[10]. Consideration of these factors and increased research into the drivers of both the benefits and barriers around this could increase both uptake and successful implementation of best practice in this area.

QUESTION 6: What should the Government consider in identifying suitable locations for spatially targeted incentives?

Prioritisation is critical. Preserving and improving minimally impacted sites should be prioritised, to maximise the ecological benefits[11][12].The successful trials involving the reintroduction of beavers in Britain has shown the benefits of area prioritisation and the positive downstream impacts that can be achieved from this[13].

A holistic approach is needed to ensure that land use change is not focused on certain ecological habitats. Consideration should be given to the interconnectedness of different habitats, encompassing species ranges and migratory patterns across and outside of the UK[14]. A uniformed understanding of entire ecosystem function and the keystone species within this is essential. Planning for this should be evidence based, using tools such as habitat network maps[15].

When implementing policies such as tree planting[16], Government should utilise modelling data which accounts for the impact of climate change on certain regions of the country, and the impact this might have on different species populations, to ensure sites are adapted to environmental changes and will be effective and appropriately managed long term.

[9] Staley, J T., Wolton, R., & Norton, L R., 2023: Improving and expanding hedgerows—Recommendations for a semi-natural habitat in agricultural landscapes. *Ecological Solutions and Evidence*

[10] Correspondence from Applied Microbiology International (AMI) regarding the Defra Sustainable Farming Initiative

[11] Mori, A, Isbell, F, 2023: Untangling the threads of conservation: A closer look at restoration and preservation, *Journal of Applied Ecology*

[12] Dasgupta, 2021. The Economics of Biodiversity: The Dasgupta Review

[13] Howe, C, Crutchley, S, 2020: The River Otter Beaver Trial: Natural England's assessment of the trial and advice on the future of the beaver population. Natural England Evidence Review NEER018

[14]JNCC, 2023: Climate change and migratory species: Summary for Policy Makers

[15] Forest Research: Habitat fragmentation – Practical considerations

[16] Forest Research, 2022: Adapting forest and woodland management to the changing climate

QUESTION 7: What approach(es) could most effectively support land managers and the agricultural sector to steer land use changes to where they can deliver greater potential benefits and lower trade-offs?

An effective workforce containing staff with relevant advisory, technical, and translational skills, with capacity to meet nationwide demand would ensure land managers are given support which is based on sound scientific advice and guidance. Independent recognition, through publicly available certification schemes such as the RSB professional registers[17] would help identify staff demonstrating the necessary skills and instil confidence in decision-making. Staff should be encouraged to maintain a continuing professional development record, allowing them to identify areas for further learning and keep their knowledge up to date in this area.

Knowledge exchange and delivery both across industry and in public communication and outreach when it comes to risk assessment and surveillance would ensure resilience and timeliness in the sector against biosecurity threats such as new and emerging pests and diseases, which would reduce the environmental and economic impact of these and ensure these risks are considered as part of land use changes.

Legislation supporting the use of bioengineering in plants can also unlock multiple benefits in this sector, by enhancing disease resistance, and increasing productivity and nutritional content[18].

QUESTION 8: In addition to promoting multifunctional land uses and spatially targeting land use change incentives, what more could be done by Government or others to reduce the risk that we displace more food production and environmental impacts abroad? Please give details for your answer.

- **Monitoring land use change or production on agricultural land**
- **Accounting for displaced food production impacts in project appraisals**
- **Protecting the best agricultural land from permanent land use changes**

The UK continues to only produce approximately 60% of its domestic food supply[19], and reducing this would seriously threaten national food security, by increasing reliance on imports which are vulnerable to the effects of climate change and geopolitical tensions[20].Care should be taken to ensure that conversion of agricultural land to use for alternative practises such as biofuel production or renewable energy generation does not pose a threat to overall food production.

[17] RSB Professional Registers homepage
[18] House of Lords Science and Technology Committee, 2025: Don't fail to scale: seizing the opportunity of engineering biology
[19] Defra, 2024: UK Food Security Report 2024
[20] Food, Farming and Countryside Commission, 2025: Paying the Price: Cheap food, big business and the cost to farming and food security

- **Other (Please Specify)**

Improving agricultural efficiency through increased support for the research, development, and uptake of new techniques can lead to increased crop productivity with reduced resources. Legislation needs to support this, and we strongly support the intention of the Genetic Technology (Precision Breeding) Act to remove certain products of modern biotechnology from the scope of regulations around Genetically Modified organisms and regulate them in a more proportionate way.[21]

Emerging infectious diseases in plant populations can also seriously jeopardise food security[22], and effective biosecurity and surveillance programs should be in place to detect potential pests and diseases as soon as possible and minimise their impact on domestic food supply chains.

QUESTION 9: What should Government consider in increasing private investment towards appropriate land use changes?

Decisions on land use changes should be made based on the most accurate scientific advice available. It is essential that this decision making process involves input from relevant experts in the appropriate fields. Determining private investment should not solely focus on economic value and opportunity, but rather should encompass areas beyond this, such as biodiversity impact, the role of areas in societal health and wellbeing, and downstream impacts of proposed land use changes.

Agri-Environment Schemes have been shown to have potential for improving factors such as species abundance in areas managed by these schemes[23]. These schemes should be supported and expanded, and their impact should be monitored closely to ensure they are effective and are having maximum beneficial impact.

Government should also consider and highlight the opportunity cost which could be incurred through inaction on these issues, both to private businesses and society as a whole. Nature degradation can have a significant impact on UK GDP[24], with many models understating the impact of this[25]. Making the economic risks of this to the UK and global economy clear to relevant stakeholders can help incentivise investment as means to reduce this risk.

QUESTION 10: What changes are needed to accelerate 30by30 delivery, including by enabling Protected Landscapes to contribute more? Please provide any specific suggestions.

- **Strengthened Protected Landscapes legislation (around governance and regulations or duties on key actors) with a greater focus on nature**
- **Tools: such as greater alignment of existing Defra schemes with the 30by30 criteria[23]**

[21] Royal Society of Biology, 2024: Letter from the Royal Society of Biology to the Food Standards Agency regarding the proposals for a new framework in England for the regulation of precision bred organisms used for food and animal feed

[22] Royal Society of Biology, 2024: Response from the Royal Society of Biology (RSB) to the House of Commons Science and Technology Committee inquiry into emerging diseases and learnings from covid-19

[23] Natural England, 2023: Agri-Environment Evidence Annual Report 2023

[24] Green Finance Institute, 2024: Assessing the Materiality of Nature-Related Financial Risks for the UK

[25] Institute and Faculty of Actuaries (IFoA), 2025: Planetary Solvency – finding our balance with nature

- **Resources: such as funding or guidance for those managing Protected Landscapes for nature**

As well as the size of areas designated for protection, focus should also be on improving and maintaining site quality. This should involve conversations with stakeholders from the regional to local level, and a systems thinking approach to understand drivers of biodiversity loss or restoration in specific areas[26]. Designated areas must have ensured protection for the long term to ensure effectiveness, which includes allocated resources for site monitoring and management[27].

- **Other (please specify)**

Plans to increase biodiversity, and reduce greenhouse gas emissions and chemical and waste pollution should be interconnected. Biodiversity should encompass species abundance and species richness, factoring in how these differ across ecological niches. Protected areas should be large enough to support sustainable functioning ecosystems long term. New and current infrastructure projects should consider the interconnectedness of these habitats in their planning through schemes such as wildlife corridors, and regulation should support this in way that allows for effective, sustainable development, based on sound scientific evidence.

Understanding the threat new and emerging pests, for example the Asian Hornet, may have on biodiversity, and developing appropriate surveillance programmes for this, can help support goals and reduce risks in this area[28].

QUESTION 11: What approaches could cost-effectively support nature and food production in urban landscapes and on land managed for recreation?

QUESTION 12: How can Government ensure that development and infrastructure spatial plans take advantage of potential co-benefits and manage trade-offs?

A systems thinking approach across departments is essential. Policy plans from separate departmental and non-departmental bodies should be developed in conjunction with one another, to ensure targets are both realistic and strategically aligned relative to land and community requirements.

Encouraging the adoption of further frameworks such as the Living Building Challenge[29], in addition to certification schemes such as BREAAM in construction projects would encourage verified sustainably built infrastructure.

Processes such as the Framework for Strategic Sustainable Development (FSSD) should be considered as part of development processes. Implementing these frameworks across different sectors would allow a common scale with which stakeholders can align too, improving communication across stakeholder groups and allowing flexibility for different projects and

[26] Natural England, 2022: A think piece on the effectiveness of protected areas in England

[27] British Ecological Society, 2022: Protected Areas and Nature Recovery. Achieving the goal to protect 30% of UK land and seas for nature by 2030

[28] Pedersen, I, Kennedy, P, O'Shea-Wheller, T et al. 2025: Broad ecological threats of an invasive hornet revealed through a deep sequencing approach, *Science of The Total Environment*

[29] Living Building Challenge Homepage

developmental requirements. Effective communication with stakeholders as part of this process would ensure consideration of different sectoral and environmental needs and interdependences.

QUESTION 13: How can local authorities and Government better take account of land use opportunities in transport planning?

QUESTION 14: How can Government support closer coordination across plans and strategies for different sectors and outcomes at the local and regional level?

Sharing of data and planning alongside tools such as habitat network maps and modelling services across networks can ensure habitat fragmentation does not occur as a result of separate development strategies. As mentioned in our response to question 12, policy plans from separate departmental and non-departmental bodies should be developed in conjunction with one another, to ensure targets are both realistic given the amount of land available, and strategically aligned relative to land requirements.

A functioning relationship and two-way communication between the science sector and Government can ensure coordinated engagement in this space, and RSB stands ready to assist with this. Additionally, coordination with experts at the local level ensures consideration of specific ecosystems and community needs, across different land areas which may be under separate jurisdictions with specific land use needs and functions. This is essential to ensure effective implementation and incorporation of land use changes designed to bring multiple benefits[30].

QUESTION 15: Would including additional major landowners and land managers in the Adaptation Reporting Power process (see above) support adaptation knowledge sharing? Please give any reasons or alternative suggestions

[Yes / No / I don't know]

[30] Davis, K, Chadès, I, Rhodes, J, Bode M, 2019: General rules for environmental management to prioritise social ecological systems research based on a value of information approach *Journal of Applied Ecology*

QUESTION 16: Below is a list of activities the Government could implement to support landowners, land managers, and communities to understand and prepare for the impacts of climate change. Please select the activities you think should be prioritised and give any reasons for your answer, or specific approaches you would like to see.

- Providing better information on local climate impacts to inform local decision making and strategies (for example, translating UK Climate Projections[29] into what these mean in terms of on-the-ground impacts on farming, buildings, communities and nature)
- Providing improved tools and guidance for turning climate information into tangible actions (for example, how to produce an adaptation plan for different sectors)
- Developing and sharing clearer objectives and resilience standards (for example, a clear picture and standards of good practice for each sector under a 2°C climate scenario[30])
- Supporting the right actions in the right places in a changing climate (for example, prioritising incentives for sustainable land uses where they will be most resilient to climate change)
- Other (please specify)

QUESTION 17: What changes to how Government's spatial data is presented or shared could increase its value in decision making and make it more accessible?

- **Updating existing Government tools, apps, portals or websites**
- **Changes to support use through private sector tools, apps or websites**
- **Bringing data from different sectors together into common portals or maps**

As part of a reflective cycle, Government should collect data on progress towards its own goals, alongside meta-synthesis to convert data to insights to aid decision-making. This data should include accurate and up-to-date information on condition of different sites, encompassing factors such as species richness and abundance over time, in comparison with baseline data. There are often gaps in this area, and utilising data from other areas such as community monitoring programmes can help bridge these information gaps in some instances[31] [32].

Accurate data on progress towards national goals will also ensure that incentives are used in a targeted way. This could also help communities draw upon their own collective knowledge and skills to come up with the land-use solutions that will best serve both individual needs and national priorities[33].

- **Increasing consistency across spatial and land datasets**
- **More explanation or support for using existing tools, apps or websites**
- **Greater use of geospatial indicators such as Unique Property Reference**

[31] State of Nature Report 2023

[32] British Ecological Society, 2022: Protected Areas and Nature Recovery. Achieving the goal to protect 30% of UK land and seas for nature by 2030

[33] Davis, K, Chadès, I, Rhodes, J, Bode M, 2019: General rules for environmental management to prioritise social ecological systems research based on a value of information approach *Journal of Applied Ecology*

Numbers (UPRNs) and INSPIRE IDs to allow data to be more easily displayed on a map

- **Other (please specify)**

QUESTION 18: What improvements could be made to how spatial data is captured, managed, or used to support land use decisions in the following sectors? Please give any reasons for your answer or specific suggestions.

- **Development and planning: such as environmental survey data**

Standardised accounting and effective enforcement measures for both carbon, and biodiversity calculations could allow a consistent approach in understanding land use needs and benefits, as well as when using land as part of emissions offsetting measures. Standardised data can also assist in understanding the role of climate change on different areas of land, and implementing changes accordingly[34].

- **Farming: such as supply chain data and carbon or nature baseline measurements**

Soil health measurements taken as part of this process should consider the health of the soil microbiome, to ensure these provide an accurate representation of soil quality. Effective recording, measurement and monitoring of the impact of different stages in the agricultural cycle on the soil microbiome, and how this relates to crop productivity and environmental health, would also address evidence gaps in this area[35]. This data could be used to improve agricultural productivity alongside reduced environmental degradation. This could also assist with understanding both the opportunities and limitations of agricultural soils in carbon sequestration[36].

- **Environment and forestry: such as local and volunteer-collected environmental records**
- **Recreation and access: such as accessible land and route data**
- **Government-published land and agricultural statistics**

QUESTION 19: What improvements are needed to the quality, availability and accessibility of ALC data to support effective land use decisions?

Government consideration to update the underlying data of the ALC system is welcome. This data should be based on up to date environmental conditions, which consider the current and future impacts of climate change on abiotic factors such as temperature and rainfall, given that the baselines for these metrics have changed significantly in recent decades[37].

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[34] British Ecological Society, 2022: Protected Areas and Nature Recovery. Achieving the goal to protect 30% of UK land and seas for nature by 2030

[35] Correspondence from Applied Microbiology International (AMI) regarding the Defra Sustainable Farming Initiative

[36] Mattila T, Vihanto N, 2024: Agricultural limitations to soil carbon sequestration: Plant growth, microbial activity, and carbon stabilization, *Agriculture, Ecosystems & Environment.*

[37] CPRE & Grounded Insight, 2025: Land use and the Agricultural Land Classification: stick, twist or bust?

QUESTION 20: Which sources of spatial data should Government consider making free or easier to access, including via open licensing, to increase their potential benefit?

QUESTION 21: What gaps in land management capacity or skills do you anticipate as part of the land use transition? Please include any suggestions to address these gaps.

- **Development and planning**
- **Farming**

A report from the SCI Horticulture Group identified a lack of plant science content in higher education courses, which threatens future workforce capabilities to match the skill requirements needed in areas such as food production[38]. A framework linking this area to related fields in the plant sciences such as biotechnology can help develop effective solutions to current skills and productivity gaps in this sector. Financial pressures faced by Universities may impact this further, and support is vital to help them achieve financial sustainability so that they are fit for purpose to help fill these skill pipelines[39].

- **Environment and forestry**

Strategic investment is needed to meet the current and future skills growth demands in this sector. Over a third of UK vacancies in 2022 were due to skills shortages[40], with many of these gaps being skills that would be required as part of the land use transition and wider environmental objectives. For example, a report by the Chartered Institute of Ecology and Environmental Management (CIEEM) and Lantra found that there is an unquantified capacity crisis and skills gap in the ecology sector, and "no robust attempt to quantify future demand for ecology skills as we scale-up climate change adaptation"[41,42]. These skills are essential in areas such as ecosystem restoration and monitoring.

According to the Seventh Carbon Budget, tree planting rates need to more than double from 13 kha in 2023 to 32 kha per year by 2030[43]. This will require a significant expansion and upskilling of the forestry workforce. Whilst Government investment is welcomed, this needs to be sustained and expanded to meet projected workforce demands.

- **Recreation and access**
- **Other (please specify)**

Government should also effectively assess the skills gaps and demands that will arise as part of adjacent strategic objectives, such as the Invest 2025 industrial strategy[44], and ensure a coordinated approach where workforce needs across these may overlap.

[38] Trinder S, Heaven T, Luberti M, Read S, Scanlon A, Gauntner C, et al., 2025: Analysis of plant science higher education reveals mixed provision which falls short of delivering national priorities. *JSFA Reports*.
[39] The Royal Society of Biology, 2025: Representation to the UK Spending Review Part 2, 2025
[40] The Royal Society of Biology, 2025: Representation to the UK Spending Review Part 2, 2025
[41] Chartered Institute of Ecology and Environmental Management (CIEEM), 2023: Vocational pathways into nature-based green jobs
[42] The Royal Society of Biology, 2025: Representation to the UK Spending Review Part 2, 2025
[43] Climate Change Committee, 2025: The Seventh Carbon Budget
[44] Department for Business and Trade, 2024: Invest 2035: the UK's modern industrial strategy

QUESTION 22: How could the sharing of best practice in innovative land use practices and management be improved?

Both industry and academia would benefit from proactive knowledge exchange schemes, to enable research to be better incorporated into practice. As mentioned in our response to Question 5, demonstration processes, Model sites, and increased support for knowledge sharing and advisory networks can all help remove perceived barriers to implementation of new practises, as well as better demonstrate their viability[45].

Maintenance and expansion of problem based practical and fieldwork skills in higher education courses can also help prepare and support future workforce generations in this space[46]. Skills England should be appropriately resourced to ensure the effective development of training and technical qualifications for individuals which are aligned with skills needs which are relevant to current workforce practice and technologies[47].

Encouraging engagement and improvement of areas of land on estates such as schools, through projects like the National Education Nature Park[48], can serve a dual purpose of increasing knowledge exchange and teaching of best practice in this space, whilst also enhancing the quality of these sites.

QUESTION 23: Should a Land Use Framework for England be updated periodically, and if so, how frequently should this occur?

- **Yes, every 5 years**
- **Yes, every 3 years**
- **Yes, another frequency or approach. Please provide details**

Review and updating of the framework will be needed to ensure continued relevance in line with current scientific advice and policy goals. However, this should be updated in line with other Government strategy reviews such as those required as part of the Environment Act, to ensure relevant frameworks and targets remain interlinked, consistent and achievable. Major updates and reviews should be limited where possible, as consistency is important to ensure trust between landowners and Government, so that they can be assured long term support in this area. Many of the schemes which need to happen as part of land use changes such as tree planting initiatives will take many years to take effect, and therefore long term financial support, assessment and monitoring is critical to ensure the benefits of these schemes are achieved[49]. Constant or sudden changes to targets and policies in this space, such as the closure of the Sustainable Farming Initiative, can risk undermining relationships with relevant stakeholders.

- **No**
- **I don't know**

[45] Hurley, P.D., Rose, D.C., Burgess., P.J., Staley, J.T., 2023: Barriers and Enablers to Uptake of Agroecological and Regenerative Practices, and Stakeholder Views towards 'Living Labs'. Report from the "Evaluating the productivity, environmental sustainability and wider impacts of agroecological compared to conventional farming systems"

[46] 4 Royal Society of Biology, 2021: Evolving 5-19 Biology: recommendations framework for 5-19 biology curricula

[47] Skills England, 2024: Driving growth and widening opportunities

[48] National Education Nature Park homepage

[49] Brancalion, P, Holl, K, 2020: Guidance for successful tree planting initiatives, *Journal of Applied Ecology*

QUESTION 24: To what extent do you agree or disagree with the proposed areas above? Please include comments or suggestions with your answer.

[Strongly agree / Agree / Neither agree nor disagree / Disagree / Strongly disagree / I don't know