British Ecological Society

CALL FOR EVIDENCE ON THE GOVERNMENT'S REVIEW OF THE BALANCE OF COMPETENCES BETWEEN THE UK AND THE EU – Environment and Climate Change

The British Ecological Society (BES) is pleased to present its response to the Defra/DECC consultation on the balance of competences between the UK and the EU in the areas of the environment and climate change.

The BES is the UK's learned society for the science of ecology, and is the oldest ecological organisation in the world. The Society has over 4,000 members based in the UK and around the world, including leading scientists working in research institutions and practicing ecologists working in industry.

In this response, we focus specifically on the impact of EU actions in the areas of (i) Water and Marine and (ii) Nature and Biodiversity, and on the need for EU-level approaches in these areas.

Summary

- EU competence in the area of environment has led to directives that have had a positive impact on the UK's water quality and biodiversity, and strong evidence exists to support this. Moreover, EU measures have led to improvements in the UK environment that would not have occurred under pre-existing UK laws, and have set precedents for subsequent UK legislation.
- EU environmental regulation and directives provide continued protection for the UK environment despite national economic constraints and budget cuts in relevant Government departments. These overarching policies ensure that environmental protection measures are not at risk of being pitted against each other in the face of austerity.
- Long term trends in climate change and habitat degradation will render EU competence in the area of environment even more important in the future. Ensuring habitats and environments are resilient and able to withstand changes is a complicated process, requiring broad, long-term policies and international coordination.
- In some cases, the 'one size fits all' policy may not be the best approach for the environment in all member states. Greater flexibility on individual policies for member states could therefore lead to cost-effectiveness for the UK, especially in relation to environmental management.

Nature does not respect national boundaries. A joined up approach across Europe on biodiversity is necessary for effective action in this area, as each country's actions will affect its neighbours. While the UK is more geographically isolated in some senses, the issue is still particularly relevant with respect to water and migratory animals such as birds. The need for a coherent approach to the environment across Europe will also become more apparent

in the future. As climate change leads to species relocation[1], a broader scale view of conservation will be needed to understand where species need to be protected the most. Furthermore, there are environmental issues that require effective international collaboration, such as protection from Invasive Alien Species, and issues where only a cumulative effect at a large scale will have a positive impact (such as ocean acidification).

1. What evidence is there that EU competence in the area of environment and/or climate change has benefitted or disadvantaged the UK/your sector?

There are several examples of EU competence having had a positive impact on the UK environment:

Birds

The Birds Directive (79/409/EEC) has successfully protected bird species that are considered to be most at risk and in need of most urgent protection, and has made a significant difference to protecting many other species from further decline. Research has shown that the targeted conservation measures associated with birds listed in Annex I of the Directive have resulted in these species faring better than those that are not listed for protection[2]. Research has also shown that outside the EU, where the Birds Directive does not apply, Annex I species fare no better than birds that were not on Annex I. This suggests that EU approaches can be more effective than non-EU actions.

Water

The Water Framework Directive (2000/60/EEC) has had a positive impact by encouraging water managers to look beyond issues of water quality and take a wider, catchment based approach to water resource management. The directive has ensured that managers consider the overall ecological condition of water bodies in planning and decision making. For example, the Upstream Thinking initiative[3] by Wessex Water uses these ideas. It is important for the future that water management is ecologically sensitive in addition to helping safeguard aquatic ecosystems[4,5,6].

As a result of the Urban Waste Water Treatment Directive (91/271/EEC) and the Bathing Water Directive (76/160/EEC), there have been improvements in water quality due to tighter controls over wastewater treatment and a ban on releasing sewage into the sea.

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[1] Pateman R. 2013. The effects of climate change on the distribution of species in the UK. Terrestrial Biodiversity Climate Change Impacts. Report card technical paper 6.

[2] Donald, P. F., Sanderson, F. J., Burfield, I. J., Bierman, S. M., Gregory, R. D., & Waliczky, Z. 2007. International conservation policy delivers benefits for birds in Europe. *Science*, **317**: 810-813

[3] http://www.southwestwater.co.uk/index.cfm?articleid=8329

[4] Everard, M. 2011. Why does 'good ecological status' matter? *Water and Environment Journal*, **26**: 165–174

[5] White, I. & Howe, J. 2003. Policy and practice: planning and the European Union Water Framework Directive. *Journal of Environmental Planning and Management*, **46**: 621 – 631

[6] Kallis, G. & Butler, D. 2001. The EU Water Framework Directive: measures and implications. *Water Policy*, **3**: 125-142.

Bathing water testing in the UK, 1990-2012[7]

Testing year	1990	1996	2000	2005	2010	2012
EU/76/160 – tested	446	472	545	559	605	626
EU/76/160 – guideline	-	194	247	420	497	366
EU/76/160 – mandatory	345	423	514	550	589	590
EU/76/160 – fail	101	49	31	9	16	36

River water quality data[8]

% of river length of Good biological quality	England	Wales
1990	55.4%	78.5%
1995	66.2%	87.0%
2000	69.0%	78.3%
2005	71.4%	80.0%
2009	72.5%	87.1%

Marine

The Marine Strategy Framework Directive (2008/56/EC) has been influential in prompting the UK to better consider the problems impacting the marine environment and develop ways to encourage its protection. Adopting the framework in the UK was necessary because only a combined effort between all EU member states will help to ensure that the aim of the directive, to achieve 'Good Environmental Status' of the EU's marine environment, is met. This is because pressures on the marine environment such as pollution and fishing extend beyond the UK's territorial and exclusive economic zone borders. While there are comparable links to the WFD, the MSFD is an important piece of legislation which covers wider marine issues and biodiversity which are beyond the scope of the WFD.

Habitats

The Habitats Directive (92/43/EEC) has helped UK conservation bodies look at conservation in a wider EU context in a more systematic way. The directive has encouraged the protection of a variety of habitats throughout the UK which provide benefits not only from ecological perspectives but also for society and the economy (through ecosystem services).

The directive has also been important for ensuring species in the UK such as great crested newts and dormice receive adequate protection, particularly in regards to planning infrastructure and developments. Both of these species were already protected under the UK's Wildlife and Countryside Act (1981), but the directive ensured that their habitats were thought of as a network (rather than individual sites as the UK planning system does) and set out how impacts should be mitigated. The principle of networked habitats is one that the

[7] European Environment Agency
Bathing Water Directive – Status 1990 – 2012, EEA, 21 May 2013
http://www.eea.europa.eu/data-and-maps/data/bathing-water-directive-status-of-bathing-water-5
[8] DEFRA. 2010. River water quality indicator for sustainable development – 2009 annual results. DEFRA statistical release, 7th September 2010, DEFRA, London, UK

government has now accepted through references to the Lawton Review[9] in the Natural Environment White Paper.

The introduction of stronger protection for Special Areas of Conservation under the Habitats Directive led to subsequent strengthening of the protection for SSSIs, e.g. under the Countryside and Rights of Way Act (2000); this provides an example of EU measures setting a precedent that is usefully reflected in subsequent UK laws.

Air Quality

There have been significant improvements in air quality due to a number of EU Directives[10]. This has led to a statistically significant decrease in acidic deposition[11], which benefits both the wider environment and specific conservation efforts, for example, chalk grasslands. Particulate matter and gaseous emissions can alter species composition in natural habitats. In calcareous grassland, NO_2 emissions lead to lower abundances of native grassland species[12]. Calcareous grassland is a diverse landscape, with up to 40 species per square metre, including rare endemic species such as orchids and early gentian (*Gentianella anglica*)[13].Many species found in this landscape are the sole food source for specialist insect groups including the Adonis blue butterfly (Lysandra bellargus)[14].

However, while extensive EU and UK policy intervention on acidification has produced considerable success, problems with air pollution remain. Between 2006 and 2008, 58% of all habitat areas sensitive to eutrophication from nitrogen deposition exceeded the Critical Load for nutrient nitrogen and is only forecast to decrease to 48% by 2020. Both UK and EU legislation have failed to effectively reduce ammonia emissions, which are more toxic than other forms of nitrogen deposition[15].

Other

In addition, EU programmes such as LIFE[16] have facilitated the exchange of environmental knowledge, expertise and helped with funding provision for various UK conservation and environmental innovation projects.

2. Considering specific examples, how might the national interest be better served if decisions currently made at EU level were instead made at a national, regional or international level? (What measures, if any, would be needed in the absence of EU

[9] http://archive.defra.gov.uk/environment/biodiversity/documents/201009space-for-nature.pdf

[10] The Framework Directive 96/62/EC, 1-3 daughter Directives 1999/30/EC, 2000/69/EC, 2002/3/EC, and Decision on Exchange of Information 97/101/EC were merged in 2008 to form the overarching Air Quality Directive 2008/50/EC

[11] Kirk, G.J.D., Bellamy, P.H. & Lark, R.M. 2010. Changes in soil pH across England and Wales in response to decreased acid deposition. *Global Change Biology*, **16**: 3111-3119.

[12] Lee, M.A. & Power, S.A. 2013. Direct and indirect effects of roads and road vehicles on the plant community composition of calcareous grasslands. *Environmental Pollution*, **176**: 106-113

[13] Stevens, C.J., Thompson, K., Grime, J.P., Long, C.J. & Gowing, D.J.G. 2010. Contribution of acidification and eutrophication to declines in species richness of calcifuges grassland along a gradient of atmospheric nitrogen deposition. *Functional Ecology*, **24**: 478-484.

[14] Twiston-Davies, G., Mitchley, J. & Mortimer, S.R. 2011. The Stonehenge Landscape Restoration Project – conservation opportunities for rare butterflies? Aspects of Applied Ecology, 108: 259-265.

[15] 2012 Review of Transboundary Air Pollution: Acidification, Eutrophication, Ground Level Ozone and Heavy Metals in the UK http://www.rotap.ceh.ac.uk/sites/rotap.ceh.ac.uk/files/RoTAP%20Summary%20report.pdf

[16] http://ec.europa.eu/environment/life/

legislation?) What decisions currently made at a national level could better be made at an EU level?

In some circumstances, allowing the UK more flexibility in the way that it enforces and makes decisions regarding particular species or habitats could further benefit the national interest, particularly surrounding building and planning. For example, great crested newts are relatively common in the UK compared to the EU. Greater flexibility over the way they are protected would allow the UK to focus on other species that are nationally or internationally rare, providing greater cost-effectiveness. It would still, however, be necessary to ensure that the EU has scrutiny over such cases in order that the UK still works to protect internationally protected species and does not lead to undervaluing of such species.

3. Considering specific examples, how far do you consider EU legislation relating to environment and climate change to be focused on outcomes (results) and based on an assessment of risk and scientific evidence?

EU legislation is outcome-focused, both in terms of quantified habitat extent and condition within the Habitats Directive, and through achieving good ecological status within the Water Framework Directive and good environmental status under the Marine Strategy Framework Directive.

The recent EU decision to ban the use of neonicotinoids is an example of a policy based on an assessment of risk and scientific evidence.

4. How could the EU's current competence for the environment be used more effectively? (e.g. better ways of developing proposals and/or impact assessments, greater recognition of national circumstances, alternatives to legislation for protecting/improving the environment?)

There are cases where individual directives could be linked with others to benefit the UK and EU environment more widely and acknowledge the links between different ecosystem processes and pressures. For example, linking the Water Framework Directive with the Common Agricultural Policy would help to encourage farmers to manage diffuse pollution and promote aquatic habitat remediation. Linking legislation would also help to build greater resilience against future threats such as climate change.

The current approach to conservation tends to rely heavily on protected areas rather than on more integrated approaches to land-use. The latter may be more suitable for countries such as the UK where the majority of the landscape is managed. Due to this, there is a strong emphasis in the UK on the integration of agri-environment payments under the CAP and conservation action in protected sites. However that is not the case in some other states where the CAP is more significant in terms of maintaining farming communities. Shifting more of the CAP support to environment would benefit both the UK and conservation across the EU more widely.

European legislation could usefully build on the increasing understanding of ecosystem services by including references to this concept in future directives. This approach is

recognised in the Resource Efficient Europe initiative[17]. In general, further reform of directives is required if biodiversity loss is to be halted and ecosystem services restored.

5. How far do you think the UK might benefit from the EU taking more or less action on the environment/climate change?

EU legislation helps to ensure that the UK implements and upholds environmental policies. Additionally, the fact that the EU can prosecute and hold the UK accountable for circumstances when it breaches legislation helps to safeguard the UK environment for the future.

This is also important in the context of the current global economic climate and restricted national budgets – EU legislation helps to make sure that the environment still receives funding for research, projects and protection. Without the overarching EU legislation, the UK could fall into the trap of choosing between habitats when putting forward proposals for housing or infrastructure projects. This could lead to environmental 'losers' – habitats that are destroyed or degraded much more, as they are 'cheap' and easy to convert. In practice, many of the measures in the Water Framework Directive and climate mitigation are funded through general end-user water and energy bills rather than the public purse, and EU directives need not always represent a central cost.

There is no evidence to support the assertion that directives place costs on businesses and impede development but in the absence of the safeguards that these provide there is a high probability that a catastrophic loss of natural capital will occur.

6. Are there any alternative approaches the UK could take to the way it implements EU directives on the environment and climate change?

As a result of climate change, species have or will move their ranges[18]. In light of this, current protected areas (SPAs, SACs, SSSIs) set up to protect particular species may find that such species move away from these areas. In addition, new species may arrive in these areas. If the Habitats Directive is fully upheld, it could make the UK accountable for such losses, with little consideration for species of conservation concern that do arrive in the protected site. As such, it may be appropriate for the way that areas are designated to be a more flexible process that emphasises functional connectivity[19] and assesses whether a site is deteriorating based on species diversity rather than on the disappearance of one particular species.

7. What future challenges or opportunities may we face on environmental protection and climate change?

Climate change is one of the greatest threats to both the UK and global environment. Changes in the environment will result in species range shifts, which could present problems

[17] http://ec.europa.eu/resource-efficient-europe/pdf/resource_efficient_europe_en.pdf

[18] Pateman R. 2013. The effects of climate change on the distribution of species in the UK. Terrestrial Biodiversity Climate Change Impacts. Report card technical paper 6.

[19] See also the recommendations of *Impacts of climate change and selected renewable energy infrastructures on EU biodiversity and the Natura 2000 network* http://www.unep-wcmc.org/impacts-of-climate-change-and-selected-renewable-energie-infrastructures-on-eu-biodiversity-and-the-natura-2000-network-_906.html

for designation of conservation status to species and protection of particular habitats[20]. With changing climates, the UK could become increasingly important in providing for species that move further northward with suitable habitat[21]. This presents a number of issues: there need to be suitable habitats for species to move into; protected areas need to be more flexible to allow for changes in species presence; and there needs to be closer monitoring of areas to ensure species are protected if their ranges do change.

With climate change, water scarcity could be an increasing problem for many areas. Several criteria within the Water Framework Directive will play an important role in ensuring water resources are managed effectively, to the benefit of both people and the environment. Continued monitoring of the impact of abstraction will be vital to prevent damage to the environment and the ecosystems and communities within.

The number of extreme events, such as flash floods and droughts, are also expected to increase with climate change[22]. Understanding the potential impacts of this on UK ecosystems is crucial to aid future mitigation planning. By better protecting the environment against extreme events, key ecosystem services that people depend upon can be maintained. Approaches that balance the need to protect people and property from flooding against the need to protect freshwater ecosystems can provide 'win-win' benefits for both people and the environment. These include Sustainable Drainage Systems (SUDs) and Natural Forest Management[23]. Ensuring that plant communities remain diverse can help to provide insurance against outright collapse[24]; diversification of plant species allows for improved productivity[25,26] which will be a key tool in dealing with climate change in temperate regions[27].

The destruction, fragmentation and degradation of habitats are increasingly likely in the future as further pressure from populations is placed on the environment. This could result in

[20] Gillingham, P. (2013) 4. Implications of Climate Change for SSSIs and other Protected Areas. Terrestrial biodiversity Climate change impacts report card technical paper, LWEC

[21] Pateman, R. (2013) 6. The effects of climate change on the distribution of species in the UK. Terrestrial Biodiversity climate change report card technical paper, LWEC

[22] IPCC (2013) Managing the risks of extreme events and disaster to advance climate change adaptation.

[23] These are discussed in The Impact of Extreme Events on Freshwater Ecosystems http://www.britishecologicalsociety.org/wp-content/uploads/small_single-pages.pdf

[24] Mischkolz, J.M., Schellenberg, M.P., and Lamb, E.G. 2013. Early productivity and crude protein content of establishing forage swards composed of combinations of native grass and legume species in mixed-grassland ecoregions. Canadian Journal of Plant Science 93:445-454.

[25] Schellenberg, M.P. and Banerjee, M.R. 2002. The potential of Legume-shrub Mixtures for Optimum Forage Production: A Greenhouse Study. Canadian Journal of Plant Science 82:357-363.

[26] Schellenberg, M.P., Biligetu, B. And Iwaasa, A.D. 2012. Species dynamic, forage yield, and nutritive value of seeded native plant mixtures following grazing. Canadian Journal of Plant Science 92:699-706.

[27] Castellanos, E., McClain M., Alvarez, M., Brlacich, M., Calvo-Alvarado, J.C., Coutinho, H.L.C., Jimenez-Osomio, J.J. and Schellenberg, M. 2008. Chapter 4: Conservation to sustain ecological processes and services in landscapes of the Americas. In: Applying Ecological Knowledge to Landuse Decisions (eds.) Holm Tiessen and John W. B. Stewart. SCOPE, the Scientific Committee on Problems of the Environment, IAI Inter-American Institute for Global Change Research SCOPE publication and IICA, the Inter-American Institute for Cooperation on Agriculture. Pages 23-33. ISBN:9788599875049

less lockdown of carbon[28], poorer quality forage for livestock[29], fewer pollinator refuges[30], and less diverse plant genetic resources[31].

Opportunities

The advance of spring could be advantageous to terrestrial systems[32]. A longer growing season could affect acid grasslands by offering more opportunities for germination and growth, therefore C lockdown. Extra winter rainfall predicted by climate change can buffer ecosystem functions particularly respiration in the face of summer drought. In addition, smaller rainfall pulses could offer an opportunity to delay succession in grassland and allow more wildflower meadows to thrive[33,34,35].

[28] Zhang, L., Wylie, B.K., Ji, L. Gilmanov, T.G., Tieszen, L.L. & Howard, D.M. 2011. Upscaling carbon fluxes over the Great Plains grasslands: sinks and sources. *Journal of Geophysical Research: Biogeosciences*, **116**: G00J03.

[29] Harmens, H., Mills. G., Hayes, F. & Norris, D. 2011. Air Pollution and Vegetation. ICP Vegetation Annual Report 2010/2011.

[30] Jauker, B., Krauss, J., Jauker, F. & Steffan-Dewenter, I. 2013. Linking life history traits to pollinator loss in fragmented calcareous grasslands. *Landscape Ecology*, **28**: 107-120.

[31] Jadarat, A.A. 2010. Genetic resources of energy crops: biological systems to combat climate change. *Australian Journal of Crop Science*, **4**: 309-323.

[32] Menzel, A., Sparks, T. H., Estrella N., Koch, E., Aasa, A., Ahas, R., Alm-Kübler, K., Bissolli, P., Braslavaská, O., Briede, A., Chmielewski, F. M., Crepinsek, Z., Curnel, Y., Dahl, Å., Defila, C., Donnelly, A., Filella, Y., Jatczak, K., Måge, F., Mestre, A., Nordli, Ø., Peñuelas, J., Pirinen, P., Remišová, V., Scheifinger, H., Striz, M., Susnik, A., van Vliet, A. J. H., Wielgolaski, F.-E., Zach, S. & Zust, A. 2006. European phenological response to climate change matches the warming pattern. *Global Change Biology*, **12**: 1969–1976

[33] Knapp, A.K., Fay, P.A., Blair, J.M., Collins, S.M., Smith, M.D., Carlisle, J.D., Harper, C.W., Danner, B.T., Lett, M.S. & McCarron, J.K. 2002. Rainfall variability, carbon cycling and plant species diversity in a mesic grassland, **298**: 2202-2205.

[34] Chimner, R.A., Welker, J.M., Morgan, J., LeCain, D. & Reeder, J. 2010. Experimental manipulations of winter snow and summer rain influence ecosystem carbon cycling in mixed-grass prairie, Wyoming, USA. *Ecohydrology*, **3**: 284-293.

[35] Fry, E.L., Manning, P., Allen, D.G.P., Hurst, A., Everwand, G., Rimmler, M. & Power, S.A. 2013. Plant Functional Group Composition Modifies the Effects of Precipitation Change on Grassland Ecosystem Function. *PLoS ONE*, **8**: e57027.