Agenda – Climate Change, Environment and Rural Affairs Committee

Meeting Venue:
Committee Room 3 – Senedd
Meeting date: 21 February 2019
Meeting time: 09.20

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Consideration of Biodiversity – Public Goods Scheme: oral briefing (09.20 – 09.30)

1 Introductions, apologies, substitutions and declarations of interest

(09.30)

2 Consideration of Biodiversity – Public Goods Scheme: evidence session with representatives of environment and conservation groups

(09.30 –10.30) (Pages 1 – 104)

Rachel Sharp, Chief Executive Officer – Wildlife Trusts Wales
Jerry Langford, Public Affairs Manager Wales – Woodland Trust
Laurence Brooks, Ecological Consultant – Ecology Planning
Robert Vaughan, Sustainable Land Use Manager – Natural Resources Wales

Attached Documents:
Research Brief
Paper – Wildlife Trusts Wales
Paper – Woodland Trust
Paper – Laurence Brooks – Ecology Consultant
Paper – Natural Resources Wales

Break (10 mins)

3 Consideration of Biodiversity - Public Goods Scheme: evidence session with representatives of Dŵr Cymru Welsh Water, National Park Authorities and the British Ecological Society

(10.40-11.40) (Pages 105 - 126)

Steve Wilson, Managing Director Wastewater Services - Dŵr Cymru Welsh Water

Emyr Williams, Chief Executive - Snowdonia National Park Authority

Geraint Jones, Farm Conservation Officer - Pembrokeshire Coast National Park Authority

Brendan Costelloe, Policy Manager - British Ecological Society

Attached Documents:

Paper - Dwr Cymru Welsh Water

Paper - National Parks Wales

Paper - British Ecological Society

4 Paper(s) to note

(11.40)

4.1 Correspondence from the Minister for Environment, Energy and Rural Affairs to the Chair regarding the UK Government's draft Environment Bill and the Welsh Government's proposals for environmental governance

(Pages 127 - 129)

Attached Documents:

Correspondence from the Minister for Environment, Energy and Rural Affairs - 7 February 2019

4.2 Additional correspondence from the Minister for Environment, Energy and Rural Affairs to the Chair regarding the publication of the Committee's report 'The impact of Brexit on fisheries in Wales"

(Pages 130 - 131)

Attached Documents:
Correspondence from the Minister for Environment, Energy and Rural Affairs - 7 February 2019

4.3 Correspondence from the Minister for Environment, Energy and Rural Affairs to the Chair regarding the outcomes-based approach to the Public Goods scheme

(Pages 132 - 137)

Attached Documents:
Correspondence from the Minister for Environment, Energy and Rural Affairs - 13 February 2019

4.4 Correspondence from the Minister for Environment, Energy and Rural Affairs to the Chair regarding discussions with the Fisheries and Marine Senior Steering Group in relation to the UK Fisheries Bill

(Pages 138 - 139)

Attached Documents:
Correspondence from the Minister for Environment, Energy and Rural Affairs - 13 February 2019

5 Motion under Standing Order 17.42 (vi) to resolve to exclude the public from items 6 and 7 of today's meeting

(11.40)

6 Biodiversity - Public Goods Scheme: consideration of oral evidence

(11.40-12.10)

7 Forward work programme: approach to environmental governance and principles

(12.10-12.30) (Pages 140 - 151)

Attached Documents:

Forward work programme

Agenda Item 2

Document is Restricted

Y Pwyllgor Newid Hinsawdd, Amgylchedd a Materion Gwledig | Climate Change, Environment and
Rural Affairs Committee
Ymchwiliad Bioamrywiaeth | Biodiversity Inquiry
Ymateb gan : Ymddiriedolaethau Natur Cymru
Evidence from : Wildlife Trusts Wales

Contents

SECTION 1 - CATASTROPHIC DECLINE OF NATURE IN WALES: A NATIONAL EMERGENCY

"Our species are in trouble, with many declining at an alarming rate. In the past 50 years, 56% of our species have declined"

David Attenborough
State of Nature 2016

1. A thriving natural environment is fundamental to the security of the economy and wellbeing of society. Wales's natural environment is also major part of Wales national identity.

2. Wales is home to a diverse range of wildlife, beautiful landscapes and natural resources. From the red kite soaring overhead, to dolphins swimming majestically in our waters to a child enthralled by a ladybird on their fingertip, we can all wonder at the variety of life and beautify around us.

3. However, even the most casual of observers may have noticed that all is not well. They may not have noticed the loss of butterflies from a favourite walk, the disappearance of sparrows from their garden, no salmon jumping in their local river, or the absence of the colourful wildflower meadows of their youth. The change has been slow and gradual. As over half of our wildlife has vanished over the last 50 years, what looks at first glance as beautiful, green and pleasant views are in actual fact becoming ecological deserts.

4. **The facts on natures' decline are shocking**. In Wales, one in 14 species is heading for extinction, 57% of wild plants, 60% of butterflies and 40% of birds are in decline. More than one third of (known) marine vertebrate and plant life has diminished, with three quarters of marine invertebrates declining across the UK. As we will see later, even our most important nature reserves, are in unfavorable condition. Worst still this is replicated around the global. But how is Wales doing, well **Wales are in the worst 25% for biodiversity loss of the 218 countries assessed globally[1].**

5. **NRW's State of Nature Report (SoNaRR)[2] affirms that no ecosystem in Wales is in favourable condition to deliver the benefits we need**. They highlighted that only 1 in 6 of our freshwater habitats are in Favourable Conservation Status and 90% of nitrogen sensitive Welsh habitats still exceed Critical Loads which impacts on ecosystem condition and resilience[3].

6. Worse still is that we are storing up chemicals in the system that will continue this decline for years to come. Wildlife is now starting to show stress due to climate change changing weather patterns and seasonal timings. The threat of climate change is potentially orders of magnitude greater for wildlife than for humans as wildlife can't use technology to cope or move rapidly. Even if they could move, climate change is likely to make other areas inhospitable with habitat loss on a global scale.

[1] State of Nature Partnership (2016) – The State of Nature http://www.wtwales.org/wildlife/state-nature-2016
[2] NRW *State of Natural Resources Report (SoNaRR)*. 2016
[3] NRW *State of Natural Resources Report (SoNaRR)*. 2016 – Chapter 3

7. This has created a '**empty landscape syndrome'**[4] with few species left to fill our remaining habitats**.** The countryside has never been so quiet and devoid of life as it is today.

8. With historical and continued environmental degradation at local, regional, and global scales, people's accepted thresholds for environmental conditions are continually being lowered. In the absence of past information or experience with historical conditions, members of each new generation accept the situation in which they were raised as being normal[5]. This psychological and sociological phenomenon is termed '**shifting baseline syndrome'**[6].

9. There is no denying that we are the cause of nature's decline. The size and scale of human impact on the planet has become so high, and the risk to nature and the services it provides to humanity so great, that scientists have suggested we have entered a new geological era, the "Anthropocene". **We are facing the world's first mass extinction event since the time of the dinosaurs**[7]**.** For the first time it is a single species, people, that are driving the change. **In turn, this will have a profound and frightening impact on human civilisation**[8]**.**

10. The direct drivers of nature's decline include habitat loss and fragmentation, land-use change (particularly agricultural intensification and softwood afforestation in Wales), pollution, and exploitation of marine ecosystems, climate change; and invasive species[9]. **The continued decline in biodiversity is because the principle pressures on biodiversity are widespread, chronic and intensifying for example, the pollution caused by rapid expansion of intensive livestock units in Wales.**

11. The State of Nature Report (2016)[10] states that the **intensification of agriculture has had the biggest impact on wildlife nationally.** It is also by far the greatest source of diffuse pollution contributing to Water Framework Directive (WFD) failures in Wales[11]. **A new study has also found that farming is the biggest single cause of air pollution in Europe**[12] as nitrogen compounds from fertilisers and animal waste drift over urban areas. In turn this air pollution is damaging Wales' wildflowers and the wealth of wildlife they underpin[13].

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[4] Akin to the 'empty forest syndrome' reported by Redfords 'The Empty Forest' which states that often trees remain in a forest that human activities have emptied of many of its large animals. The absence of these animals has profound implications, one of which is that a forest can be destroyed by humans from within as well as from without.
Kent H. Redford Source: BioScience, Vol. 42, No. 6 (Jun., 1992), pp. 412-422 Published by: University of California Press on behalf of the American Institute of Biological Sciences
https://web.archive.org/web/20131111203443/http://www.biology.ufl.edu/courses/pcb5356/2011fall/kitajima/Redford1992Biosci.pdf .

[5] Packham, Barkham and Macfarlane (2018) A People's Manifesto For Wildlife Draft One - http://www.chrispackham.co.uk/wp-content/uploads/A-Peoples-Manifesto-for-Wildlife-expanded.pdf

[6] Soga, M., Gaston, K.J. (2018). Shifting baseline syndrome: causes, consequences, and implications. Frontiers in Ecology and Evolution

[7] WWFhttps://www.wwf.org.uk/updates/landmark-report-shows-global-wildlife-populations-course-decline-67-cent-2020

[8] Ceballos, Gerardo, Paul R. Ehrlich, and Rodolfo Dirzo. "Biological annihilation via the ongoing sixth mass extinction signaled by vertebrate population losses and declines." *Proceedings of the National Academy of Sciences* 114.30 (2017): E6089-E6096.

[9] UK NEA Chapter 20: Wales

[10] State of Nature Partnership (2016) – The State of Nature http://www.wtwales.org/wildlife/state-nature-2016

[11] NRW - Diffuse Water Pollution in Wales Issues, solutions and engagement for action
https://naturalresources.wales/media/4059/diffuse-water-pollution-in-wales.pdf

[12] Bauer et al 2016 Significant atmospheric aerosol pollution caused by world food cultivation
https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2016GL068354

[13] Plantlife Cymru 'Its time to talk about nitrogen' - http://www.plantlife.org.uk/uk/about-us/news/cleanairday-air-pollution-is-ravaging-wales-wildflowers-and-the-wealth-of-wildlife-they-underpin

12. Research shows that pesticides that are approved for use are harmful to wildlife and ecosystems[14]. They have negative impacts on soil, freshwater, amphibians, bees, farmland birds, butterflies and beetles. So not only are we still destroying wildlife habitats, we continue to poison our ecosystems and spend considerable resources in taking out the base of all life in Wales, the insects that the whole ecosystem starts from and cannot exist without. This is what is known as a "bottom-up trophic cascade", in which the knock-on effects of the insect collapse surge up through the food chain[15]. When the invertebrates are declining the entire food web is going to suffer and degrade. It is a system-wide effect.

13. To add to the current woes, we are still living with the legacy of past agricultural and forestry policy and practices namely the removal of native woodland and unsympathetic planting of non-native conifers, draining of uplands, headage payments for sheep grazing, conversion of species rich grassland etc.

14. Recent studies in Europe[16] have demonstrated that the species currently at highest risk of extinction most likely got that way because of human actions 50 to 100 years ago. The negative impact of human activities on current biodiversity may not become fully realized until several decades into the future.

15. **We are essentially destroying the very life support systems that allow us to sustain our existence on the planet, along with all the other life on the planet.**

Groundhog Day

16. Unfortunately, Kirsty Williams AM warning in the foreword of 2011 Committee Report, on why we missed the 2010 targets to halt the loss of biodiversity, will come true*;*

"New European and international targets have been set for 2020. I sincerely hope that we will not have to revisit the issue of why Wales has missed its targets again in ten years' time"

Kirsty Williams AM
Chair, Sustainability Committee
Inquiry into biodiversity in Wales, January 2011[17]

17. 2010 was designated as the Year of Biodiversity and was the year by which international and European targets on halting biodiversity loss should have been met. In Wales, there were additional non-legally binding targets contained in the Welsh Government's Wales Environment Strategy (WES)[18] relating to halting the loss of biodiversity. The then Environment, Planning and Countryside Minister, Carwyn Jones AM, in his foreword pledged his "*ongoing commitment to delivering the vision set out in the Strategy*".

18. The WES non-legally binding targets included

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[14] Alternatives to herbicide in weed management - A report from PAN Europe, commissioned by the Greens/EFA group
[15] Guardian (Jan 2019) - Insect collapse: 'We are destroying our life support systems'
https://www.theguardian.com/environment/2019/jan/15/insect-collapse-we-are-destroying-our-life-support-systems
[16] Dullinger, Stefan, et al. "Europe's other debt crisis caused by the long legacy of future extinctions." Proceedings of the National Academy of Sciences (2013): 201216303.
[17] Sustainability Committee (January 2011) - Inquiry into biodiversity in Wales – see here
[18] See page 36, Welsh Assembly Government Wales Environment Strategy (2006)
https://gov.wales/docs/desh/publications/060517environmentstrategyen.pdf

- 95% of Welsh Sites of Special Scientific Interest (SSSI) were in favourable condition by 2010.
- 95% of sites of European Importance to be in favourable consideration by 2015
- 100% of all sites of international, Welsh, **and local importance** are in favourable condition to support the species and habitats for which they have been identified to be in favourable condition by 2026.

19. The idea being that if the Wildlife Sites system picked up most/all of the S42 now S7 habitats outside the international/Welsh designations, we would have a system to work with.

20. SSSI's protect only a sample of our best of our natural heritage. They have helped to protect some species which would otherwise be at risk of extinction nationally. Each SSSI is special because it preserves a unique array of plants, wildlife, and geology. They are most diverse and ecologically fascinating sites, supporting those plants and animals that find it more difficult to survive in the wider countryside.

21. Most European designated sites, known as the Natura 2000 network, included Special Protection Areas (SPA) and Special Area of Conservation (SAC) are underpinned by SSSI designations - except for the marine sites.

22. These valuable yet vulnerable sites will always be under pressure. Protecting these areas and keeping them in good shape for future generations is a profound responsibility. **We believe are now the basic minimum we need to conserve nature into the future but, to paraphrase Professor Sir John Lawton, we need more of them, we also need them to be bigger, better and more joined up.**

23. Therefore, Wales' wildlife depends heavily on the rich and varied array of habitats that are protected as SSSIs and the priority habitats in the wider countryside.

24. SSSIs do more than just preserve the best of our natural heritage. They present opportunities for the development of rural businesses, provide places for recreation and scientific research, and safeguard essential services such as clean water, flood management, carbon storage, pollination and food production. They can also form an important part of the history and cultural identity of a local area. Many of the SSSIs that provide the best opportunities for public recreation are also designated as National Nature Reserves.

25. Yet Wales, like many other countries failed to halt the loss of biodiversity by 2010. As stated above, in the past 50 years, 56% of our species have declined. We have also failed to halt the loss of biodiversity on designated sites.

26. **There has been no Wales wide review of favourable condition of SSSI has been since 2006. The 2006 review highlighted that 68% of SSSIs were in unfavourable condition and 71% of assessed habitat features are judged to be in unfavourable condition**[19]. **There is very little monitoring going on and when this is combined with little to no proactive management work, there is very little hope of any gains**.

[19] Sites of Special Scientific Interest (SSSIs) in Wales Current state of knowledge Report for April 2005 – Mar 2006

27. In response to this, the Sustainability Committee (now the CCERA Committee) in 2011 held an Inquiry into why we failed to halt the loss and reverse the decline in nature by the 2010 target[20].

28. Wales then signed up deliver the commitments of the EU Biodiversity Strategy and the UN Convention on Biological Diversity[21] to halt the decline in our biodiversity by 2020 and then reverse that decline.

29. Yet just like 2010, as the State of Nature 2016 and SoNaRR make clear, we are likely to fail to deliver against the 2020 target also. Many of reasons for failure given in 2011 Committee Report still apply today. These included
    - a lack of political ownership and leadership,
    - a focus on process rather than action and outcomes, a lack of practical work on the ground
    - a general lack of clear targets, indicators and accountability measures, leading to unclear governance, uncoordinated implementation and critical lack of resources invested including long term funding and expert staff in local authorities and statutory agencies. As well as not enough support to help farmers reach biodiversity targets.
    - inconsistent and conflicting government and local government policy for example, development prioritised over biodiversity,

30. We also know that the management budget for management of SSSIs has decreased since the year of NRW inception, from £1.805 million in 2013 to £1.654 million in 2017[22] and that the number of SSSI units needing action is 67.1% (as at August 2017)[23].

31. But yet a 2011 study[24] to estimate the current benefits of sites of special scientific interest (SSSIs) in Wales placed their value at £128m million per annum. This benefit would increase by £103 million per year if SSSIs were all restored to favourable condition.

32. We also know[25][26] that
    - approximately 75% of internationally important SAC habitats in Wales are in unfavourable condition today.
    - The condition of SAC and SPA species features on sites in Wales, as reported in 2013, remains mostly unfavourable (55%),
    - Between 2002 and 2008, fewer than half of the species on the interim Section 7 list were considered to be stable or increasing

33. The benefits that flow from Natura 2000 across the EU are of the order of €200 to 300 billion/year[27]. It is estimated that there are between 1.2 to 2.2 billion visitor days to Natura 2000 sites each year, generating recreational benefits worth between €5 and €9 billion per annum.

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[20] Sustainability Committee (January 2011) - Inquiry into biodiversity in Wales
[21] Ministerial Foreword in the Nature Recovery Plan for Wales - Setting the course for 2020 and beyond https://gov.wales/docs/desh/publications/160225-nature-recovery-plan-part-1-en.pdf
[22] NRW Freedom of Information Request
[23] NRW Freedom of Information Request
[24] GHK Consulting Ltd and partners were commissioned by Defra to examine the **benefits** of **Sites** of Special Scientific Interest (**SSSIs**) in England and Wales – see here
[25] NRW – State of Natural Resources Report – chapter 3
[26] NRW. 2016. Current data on SAC and SPA Annex I habitats and Annex II species. Internal data source. Natural Resources Wales
[27] ten Brink, P., et al. "The Economic benefits of the Natura 2000 Network. Synthesis Report." *Institute for European Environmental Policy (IEEP), GHK, Ecologic Institut, Metroeconomica, EFTEC, Luxembourg* (2013).

Therefore, investing in Natura 2000 makes sense and is directly relevant to Europe 2020 objectives of growth and employment as it can be a motor for the local and regional economy[28].

34. Therefore, something needs to change. The Environment (Wales) and the Well-being of Future Generations (WFG) Acts are a legislative recognition that way that things have been done is not working and a changed approach is necessary. **The intention and spirit of the Acts is to drive radical change. They provide the legal governance frameworks for this shift in thinking.** These Acts are unique to Wales and mean we are already ahead of much of the UK and world on our sustainable development journey.

35. But the current resources, and thus actions, are inadequate to meet the Biodiversity 2020 target to secure an overall improvement in the status of our wildlife and to prevent any further human-induced extinctions of known threatened species.

36. The implementation of the WFG and Environment Acts must provide the urgency and prioritisation to bring about the restoration and enhancement of resilience of ecosystems in Wales. Environmental restoration or 'environmental growth' must be given 'equal' weight to the social and economic goals.

37. Every part of the Welsh Government and public bodies must fully integrate nature into its decisions, policies, budgets and departments and land use policies.

38. Over the last 100 years academic studies, conservation projects and developments in economic, cultural and social studies have shown how to fix the problem and how undertaking this benefits wildlife and people.

39. We now know what is wrong, how to fix it and have explored potential avenues to gain the necessary resources at scale to reverse the loss of biodiversity. For example, the levy on single use plastic bags to be given to environmental good causes, which the Environment Act legislates for. However, this requires regulations to be enacted and to date, they have not been[29].

40. What has been lacking is awareness of the issue across public bodies and Government departments, the political willingness to invest and assumptions that economic growth is more important that the environment. **For example, NRW calculated that it will only cost £144 million (a relatively small sum of money) to restore our Natura 2000 sites, including marine, by undertaking proposed actions to address high and medium priority issues and risks which are preventing the features of the site from reaching favourable condition[30]. But yet, even with the multiple benefits this would bring, and that £144m was the equivalent of 1 mile of new motorway, this money was not forthcoming.**

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[28] ibid

[29] Section **57 Application of proceeds** (1) **Carrier bag regulations** must require the net proceeds of the charge to be applied to charitable purposes which— (a)relate to environmental protection or improvement, and (b)directly or indirectly benefit the whole or any part of Wales (whether or not they also benefit any other area).

[30] LIFE Natura 2000 Programme for Wales Supported by LIFE, a financial instrument of the European Community. N2K Wales LIFE 11 NAT/UK/385 // Summary Report https://naturalresources.wales/media/674546/nrw28788-life-natura-2000-report-december-2016-update_english_spreads.pdf

41. However, **the longer we take to arrest the decline the more difficult, expensive or impossible the task becomes**. Nature provides us with our life support system, so in a logical world, we have to accept the need to take care of nature.

We need Action not just Acts

42. Wales has exceeded in the development of legislation and policy in terms of acknowledging the loss of biodiversity. **However, to redress the problem we need a considerable rethink on how decisions are made and changing our focus from economic to environmental growth**. To date, there has been little political appetite for that challenge.

43. The most recent point at which policy should have led to action is within the Welsh Government **Nature Recovery Action Plan (NRAP)**[31]. This was produced as Wales had to submit a Biodiversity Strategy by 2015. The NRAP was supposed to set out how Wales will address the Convention on Biological Diversity's Strategic Plan for Biodiversity and the associated **Aichi biodiversity targets** in Wales. The NRAP was supposed to identify actions that can be delivered in the short term and set a course to deliver longer term commitments beyond 2020.

44. But only Part I of the Plan was approved by the stakeholder group in 2015 as **the action plan (Part II) was, in simple terms, woeful and remains so to this day**. Part II predominantly sets out the policy context and the fundamental processes that Wales is undertaking due to commitments in the Environment Act. Apart from 3 projects, it doesn't examine the need for resources, acknowledging the need to work with all partners (as it just lists NRW and Welsh Government actions) and has no ambition, ownership nor drive.

45. In short, **the NRAP should have set out what is needed to ensure natures recovery in Wales. Instead it reads as a policy 'paper' and in its current form, will not affect the change needed to implement our legal or moral commitments to halt the loss of biodiversity**.

46. The time now is for action and action needs investment.

47. To achieve this, **the replacement of the Common Agriculture Policy (CAP) must have natures recovery as a primary purpose**. This is a once in a life time opportunity to provide Wales with the resources at scale to restore biodiversity. This will need strong political leadership.

48. We have outlined in Annex 1 other areas required to halt the loss of biodiversity.

SECTION 2 – BREXIT AND OUR LAND

> "***Current farming practices are essentially mining natural capital as though it was a depleting resource rather than husbanding it for the long-term future. We have to think broadly about the relationship between current food production and future food production. We do not want to do our grandchildren down*.**"**
>
> Lord Krebs, Chair of the Adaptation Sub-Committee of the UK Climate Change Committee[32]

[31] https://www.biodiversitywales.org.uk/Nature-Recovery-Action-Plan

[32] Parliament, S., *Climate Change Adaptation Programme (Assessment)*, C.C.a.L.R.C. Environment, Editor. 2016. p. 9

49. **The production of agricultural goods which are essential to human wellbeing is highly dependent on the services provided by neighbouring natural ecosystems including pollination, biological pest control, maintenance of soil structure and fertility, nutrient cycling and hydrological services.** Preliminary assessments indicate that the value of these ecosystem services to agriculture is enormous and often underappreciated[33].

50. The State of Nature Report (2016)[34] states that the **intensification of agriculture has had the biggest impact on wildlife nationally** (see section 3 above). Other 'disservices' include agrochemical contamination and sedimentation of waterways, pesticide poisoning of non-target organisms, and emissions of greenhouse gases and pollutants. For example, we know that quantifiable soil degradation costs for England and Wales were up to £1.4 billion per year[1].

51. Unsustainable farming practices are not the only reason why wildlife is declining. But as the farmed environment covers over 80% of Wales, these unsustainable practices have a significant impact on the ecology of the Welsh landscape and this impact is not currently reflected in economic considerations.

52. However, there are many farmers in Wales who champion a way of farming which is sustainable and good for nature such as **Nature Friendly Farming Network**[35]. They want to produce great food from a countryside bursting with wildlife.

53. Most types of farms in Wales can, if managed sympathetically, provide a home for nature and deliver a host of wider benefits including carbon storage, the protection of water resources, and a wealth of landscape and cultural heritage. However, profitable farms such as intensive dairy and poultry may not opt to join any future schemes. Therefore, we need to ensure the uptake of environmental compliance and sustainable practices to avoid a continuation of environmental damage.

54. **The role of farmers and land managers in improving the environment and providing public goods provides the strongest rationale for public investment.** We need to create a food system that values and rewards nature-friendly farming and discourages and disadvantages damaging practices

55. However, the new scheme will not start until 2025 and even then, there are no guarantees that the public good scheme will take precedence over the economic resilience scheme initially or in the longer term.

56. As we have lost 56% of nature in the last 50 years it's not an unlikely prediction that if we continue as we are then we could see significant extinctions and catastrophic impacts from the loss of ecosystem services within the next 30-50 years. In this timescale 5 years is a long time. So, we need to invest in natures recovery today, then look to the new CAP replacement as ensuring future restoration and maintenance of nature.

[33] Power, Alison G. "Ecosystem services and agriculture: tradeoffs and synergies." *Philosophical transactions of the royal society B: biological sciences* 365.1554 (2010): 2959-2971.
[34] State of Nature Partnership (2016) – The State of Nature http://www.wtwales.org/wildlife/state-nature-2016
[35] https://www.nffn.org.uk/

57. The Wildlife Trusts in Wales set out the public benefits that we believe should be funded in a future land management policy in our 2018 publication, 'Our Land A future policy for land in Wales: investing in our natural resources'[36].

Design

58. Therefore, if designed well, the public good scheme will have natures recovery as a primary purpose and it will recognise the role of farmers and land managers (including major landowners such as the Wildlife Trust, RSPB and the National Trust) to achieve natures recovery – **see Annex 2 where we outline what a new public good scheme could look like**. It will also keep rural communities viable which is central to Welsh culture and an essential bond in the rural economy of Wales.

59. **Rewarding farmers for delivering environmental goods and enhancing wildlife garners significant public support. When asked 91% of those asked wanted the UK Government to pay farmers to protect nature**[37]. Also, in a survey in June 2018, **64%** of those polled in Wales stated they want **measures to protect the environment to be *strengthened*** when we leave the EU[38].

60. The **Economic Scheme** should look to encourage sustainable farming systems such as agro-ecology. Agroecosystems produce a variety of ecosystem services, such as regulation of soil and water quality, carbon sequestration, support for biodiversity and cultural services for example relating to water cycling, soil structure and fertility and nutrient cycling. Pollinators that depend on land managed extensively or land managed with wildlife in mind, can increase yields, and wild species play an important role in controlling 'pest' species, reducing the need for pesticides. Ecosystems purify and regulate the supply of inflowing water, which in turn can improve plant growth[39].

61. **However, to achieve natures recovery farmers will need to have access to high-quality independent environmental advice**. This advice should be tailored to the issues and opportunities on their farm or clusters of farms within their landscape, catchment or ecosystem.

62. It is also vital in any transition we maintain and enhance the positive work undertaken through Tir Gofal, Glastir and organic farming and continue to do this until the new public good scheme is up and running.

Tried and tested

63. Much of the public goods work is already **tried and tested** through experience over the decades of agri-environment schemes, as well as payment for ecosystem services projects, catchment management plans etc. There is a significant body of knowledge from agri-environment experience and research – what works and what doesn't – can be drawn on.

64. For example, Glastir Monitoring and Evaluation Programme (GMEP) report showed positive results[40]. For example, wetlands, grassland and heathland are all more connected in scheme

[36] Wildlife Trusts Wales (2018) 'Our Land A future policy for land in Wales: investing in our natural resources' http://www.wtwales.org/sites/default/files/future_for_farming_in_wales.pdf
[37] https://www.wwf.org.uk/campaigns/agriculture-bill
[38] NfP CCAM survey, June 2018
[39] UK National Ecosystem Assessment (2011), The UK National Ecosystem Assessment p1344
[40] https://gmep.wales/sites/default/files/GMEP-Final-Report-Exec-Summ-2017.pdf

compared to national average (189%, 135% and 154% respectively). BTO/JNCC/RSPB Breeding Bird Survey data indicate an increase in woodland and upland breeding bird populations, and stable overall bird diversity over the last 15 years. The last two years of data also suggest lowland bird populations may have turned upwards after a 15- year decline. However, the picture is not all positive and lessons need to be learned.

65. Research has shown that the number and diversity of bumblebees increases rapidly when wildflower, pollen and nectar mixes are provided[41] and grasshoppers benefit from 6 metre-wide margins[42]. Uncultivated margins and conservation headlands benefit rare arable plants, especially when targeted at areas with light, infertile soils[43]. These studies clearly show that some agri-environment options provide multiple benefits, but it is likely that a mosaic of different options, over a sufficiently large area, is required to benefit wildlife as a whole. Some species groups would undoubtedly benefit from more targeted options.

66. Agri-environment schemes have helped to increase the population of rare species and local populations of more widespread species, and there is evidence that even simple measures benefit birds[4445].

67. Farming and Wildlife Groups (FWAG)[46], RSPB, Wildlife Trusts, Welsh Water, Rivers Trusts and NRW amongst others, provide huge practical experience. There and there are also many academic analyses[47] linking farmer and expert and assessing environmental and socio-economic impacts.

68. However, we have not seen the much-hoped for recoveries of farmland wildlife – probably because not enough farmers have taken up the most effective agri-environment options, and available funding is limited.

69. Therefore, like England, we would want to see trails across Wales on differing farm size, type and topography and on all possible biodiversity measures and pesticide reductions. This trailing is needed to answer key questions of how are payment rates going to be set and payment processes tested? Obviously, we should also take the learning from the English public good trials.

Investment

70. Presently only a small percentage of the CAP budget in Wales is used for environmental measures. Post Brexit this needs to increase towards the vast majority being used for natures recovery.

71. However, there is considerable uncertainty about how the scheme will be financed. Austerity means that how we spend limited public finances is rightly under increasing scrutiny.

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[41] UK Moths (2013) Guide to the moths of Great Britain and Ireland
[42] BWARS (2013) Online guide to Bees, Wasps and Ants. Available at www.bwars.com
[43] Purvis OW, et al. (1992) The Lichen Flora of Great Britain and Ireland. Natural History Museum, London
[44] The Mammal Society, Corbet GB and Harris S (eds.) (1991) The handbook of British mammals (3rd edition). Blackwell Scientific, Oxford
[45] IUCN (2012) The IUCN Red List of Threatened Species. Version 2012.2. Available online: www.iucnredlist.org
[46] https://www.fwagsw.org.uk/news/171218-nfu-environment-report-united-by-our-environment-our-food-our-future
[47] https://www.britishecologicalsociety.org/policy/reports-publications/event-reports/

72. The awareness of what public goods are, and how they are essential for our existence, needs to be better understood by the public. There also needs to be increased understanding that communities will increasingly need the benefits that nature provides. The impacts from climate change are becoming more pronounced, we already see more frequent and serve storm events in Wales. Nature can assist us in dealing with the consequences through flood mitigation, carbon storage, better water supply and quality. The need for all of these services are only going to increase in the future so it is prudent for Wales to invest now to realise these benefits to society and our economy.

73. Certain sectors may want to see an element of future payments for everyone. This would spread a limited budget to thinly.

74. **Any future investment should be based on evidence in the form of a nature recovery map**. This will spatially represent what restoration is needed to create connected and resilient ecosystems and where direct species interventions are required. Area Statements, if ambitious and spatial, could provide this evidence base.

75. To address the limited availability, and future competition, for this public money (as there will be likely strong calls from health and education departments), investment from private sector and communities should be sought. If the new scheme could form an environmental contract, then WG could enable this. Payments for ecosystem services have already been developed and trialled across the globe. Therefore, investment in trailing new contracts over the next 5 years could help to bring in much needed additional investment into our natural resources in Wales.

76. **There is widespread evidence that, at present, we are not committing sufficient resources to management of the natural environment.** The current level of action is inadequate to reverse declines in biodiversity or to ensure the sustainable management of natural resources[48][49][50]. **To help our wildlife and environment recover we need to invest in our land and countryside at a higher level than we currently are**.

77. Just to meet current domestic and international environmental commitments **Wales would need to invest £205m annually in its farmed environment (not including advice provision, scheme support or evaluation and monitoring, for example)[51] – see table 1.** The estimate of overall costs are similar in scale to those from a previous assessment by the Land Use Policy Group (Cao et al 2009[52]). This figure is less than the current annual CAP budget.

78. The costed package of measures assumes that the entire area of priority habitats, boundary and historic environment features is sympathetically managed, and that all of those habitats and features not in good condition are restored over a ten-year period.

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[48] Cao, Y., et al., *Estimating the scale of future environmental land management requirements for the UK.* Land Use Policy Group, 2009.

[49] Defra, D., Welsh Assembly and Scottish Government, *Agriculture in the UK, 2016*. 2017

[50] GHK, *Costs of the UK Biodiversity Action Plan - Update*, R.f. DEFRA, Editor. 2010

[51] RSPB, The National Trust and The Wildlife Trusts, 2017, Assessing the Costs of Environmental Land Management in the UK. Available here: http://www.wildlifetrusts.org/sites/default/files/assessing_the_costs_of_environmental_land_management_in_the_uk_final_report_22_nov_17.pdf

[52] Cao, Y., et al., Estimating the scale of future environmental land management requirements for the UK. Land Use Policy Group, 2009. https://www.nature.scot/sites/default/files/2017-06/A931060.pdf

	Wales (£m)
Priority habitats	120
Boundary features	35
Historic environment	7
Grassland	32
Organic	5
Arable land	5
Total	205

Table 1 - **Summary of overall annual costs of meeting environmental land management priorities, based on current costs, existing strategies, objectives and commitments (£m)**

79. The work has aimed to quantify the financial resources needed for the maintenance, restoration and enhancement of ecosystems and natural resources in order to deliver multiple objectives for biodiversity, landscape, the historic environment, water, soil, climate, air quality, flood management and other ecosystem services. Other types of activity (such as policy, advisory, planning, education and communications actions, and investments in pollution prevention) were outside the scope of the work. However, it should be noted that the needs identified may not necessarily require public expenditure and some can potentially be met by other measures such as regulation.

80. The costs in the model are based on income-foregone and costs incurred. However, in non-economic farming systems there will often be very little income to 'forego', leading to low payments. This becomes an environmental issue when the underlying farming system is needed to secure a range of public goods, particularly those associated with landscape character and certain priority species. The 2011 paper for the Land Use Policy Group explored this issue in depth[53].

81. The model is likely to provide conservative estimates of the full costs of the required land management at national scale, since it is based on agri-environment payment rates. **Achieving full uptake at national scale may increase these costs.**

82. **We believe that these sums are a critical <u>minimum</u> amount and the appropriate spend on the environment has enormous added value**. Investing in our natural capital makes economic sense, the benefits far outweigh the costs[54].

Important Factors

83. Any new scheme must deliver strong outcomes at specific and system level. **The scheme needs to address biodiversity loss and targeted to specific species/habitats/services** to deliver maximum

[53] Barnes et al (2011) Alternative payment approaches for noneconomic farming systems delivering environmental public goods May 2011 https://www.nature.scot/sites/default/files/2017-06/A931062.pdf

[54] Defra, 2018. Future Farming and Environment Evidence Compendium. Available here: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/683972/futurefarming-environment-evidence.pdf

benefit, including those species and habitats on the section 7 list. Many invertebrate and lower plant species which are priority species don't benefit from the current schemes.

84. Policy should be designed to discourage pre-emptive pesticide application and over reliance on inputs and fossil fuel reliance.

85. It important that we develop trust-based relationships, forging a sense of partnership in delivering multifunctional landscapes, prioritising quality of delivery and long-term sustainability.

86. **It must consider climate change**. The recent IPPC Report states the planet will reach the crucial threshold of 1.5°C above pre-industrial levels by as early as 2030. The report has presented governments with pretty hard choices, with emissions from agriculture. These emissions need to be slashed dramatically or eliminated entirely in order for there to be any hope of meeting the goal[55]

87. It must integrate land use across different policies (including environment, forestry, farming, water).

88. **It should be joined up beyond the farm scale to work at regional/catchment scales**. Linking farmers together where that makes sense via a facilitation process (like the **farm cluster approach**[56]) so that landscape or catchment scale improvements can be achieved. Individual payments should not be determined by meeting combined obligations. Therefore, any scheme will needs to be able to identify any single none-compliance or regulation breach so the collective is not penalised.

89. **Training, advice and facilitation** – Advice is incredibly important to make sure the right approach is being implemented in the right place and in the right way. Proactive advice and facilitation is needed both before and after taking up the schemes. Advice should be affordable or free (and free from any provision by industry-sponsored advisors promoting e.g. more pesticide and fertiliser use), ensuring farmers can learn the skills of sustainable farming, habitat and species conservation and monitoring outcomes**.**

90. Facilitation of farmer-to-farmer interaction and co-operation is important. A network of area advisors should examine how new scheme can realise connectivity to enable resilience ecosystems. This evidence for this should be on a Nature Recovery Map or if appropriate, the relevant Area Statement.

91. There should be regional specific demonstration sites and benchmarking tools for sustainable management practices. As well as integration of these elements into agricultural college courses and Continuing Professional Development for farmers and advisors i.e the Green Cert in Ireland[57].

92. There should be clear and personal points of contact for any given farmer/land manager to engage with on a regular basis. A baseline understanding of trust-based relationships that honours and

[55] Garnett, T., Godde, C., Muller, A., Röös, E., Smith, P., de Boer, I.J.M., zu Ermgassen, E., Herrero, M., van Middelaar, C., Schader, C. and van Zanten, H. (2017). Grazed and Confused? Ruminating on cattle, grazing systems, methane, nitrous oxide, the soil carbon sequestration question – and what it all means for greenhouse gas emissions. FCRN, University of Oxford

[56] https://www.farmerclusters.com/

[57] https://www.teagasc.ie/education/teagasc-colleges/botanic-gardens/green-cert/

expands upon the principle of earned recognition[58], cluster farms and self-enforcement, in addition to independent monitoring. This should also incorporate lessons learnt from other countries and schemes to find systems that maximise benefits and trust between stakeholders. Such schemes may be expensive but this is a price worth paying if it has more chance of resulting in real biodiversity benefits on the ground.

93. **It must contain good monitoring and evaluation** - public investment needs a scheme of public accountability, simply setting out the benefits that are being delivered. Some of the monitoring and accountability could be done by training up farmers which would give them the added benefit of reducing isolation and increased communication of good practice). All recipients will need to be compliant with all laws and regulations and decisions on this must be based on both the Precautionary and the Polluter Pays principles.

94. We feel the **funding model** should enable a long-term approach while at the same time maintaining regular payments to farmers. **Long-term payment contracts** need to be offered to give ecosystems, habitats and species restoration and habitat creation a chance, and to give enough reassurance to the landowner. However, long-term payment contracts, even if they are linked with outcome-based payments, need to offer annual payments for the land owners. Long-term restoration need shorter term milestones and goals so that payment can be linked to these. A basic annual payment will need to be paid, but 'bonus' higher payments should be linked to meeting the milestone and targets. A cut-off for deciding the restoration is not working will need to be identified. In some cases, may need to consider giving a big upfront payment to initiate the scheme. Perhaps higher payment possibilities or bonuses for those interested in being innovative or attracting key species.

95. **Have high take-up** and be **simple and accessible** – no one should be put off by the time needed for applying or running a scheme. The process must be appropriate and not time-consuming. Biodiversity success should be focussed on outcomes and not the application process. We need a shift from paperwork to fieldwork**.**

96. **Strong links to market** – ideally building up farmer capacity for business plans that deliver the public goods (subsidised) as well as the private goods (for sale) in tandem, meaning possible branding and higher values as a result through helping farmers move away from the 'yield is king' mentality (thus can achieve land sparing for biodiversity enhancement), diversifying production and adding public value.

97. **Building l**i**nks to local community and place** – reinforcing public support by public awareness and engagement in the schemes. Also enable communities to invest in local public benefits such as access and community spaces.

Public Good Scheme

98. **We support shifting public support away from area-based payments to giving farmers financial support for providing 'public goods'** including thriving wildlife, clean air and water, preventing flooding, improved public access to farmland and healthy soil.

[58] Earned recognition is a Government initiative implemented in 2013 which 'reduces the administrative burden of regulation on those who have a strong track record of reliability and adherence to standards' (p. 4). https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/236270/pb14026-earned-recognition-plan-130830.pdf

99. We suggest that

- the payment scheme is **outcome driven / payment for results approach** with 65% upfront payments and the rest paid on completion – this approach was trialled successfully in the Burren Life Project[59]. Recently the outcomes from 'results based' payment schemes are showing useful benefits[60].
- However, farmers are likely to worried about 'results based' as they fear they may lose payment if they don't deliver the outcomes due to no fault of their own like weather conditions, or wildlife failing to flourish. That is why **there should be a right to fail**. If a landowner restores their land in order to bring a species back from the bring such as Lapwing or Curlew, but these species do not return, then they should not get penalised.
- For smaller farmers, due to scale, the compensation is insufficient. For example, for a farmer with no tractor, discs, drill or fertiliser spreader, to employ a contractor to sow out an area of wild bird seed, will cost multiple times the payment from an agri-env scheme. Likewise, for introducing native cattle, the costs of infrastructure required to keep cattle, and the cost of feed and vet as well as the capital cost of purchasing cows, is far, far in excess of the payment.
- That designated sites including Local Wildlife Sites plans an important role in the scheme including looking at opportunities to make the bigger, better and joined.

100. We offer a potential blueprint for what the public good scheme would look like in **Annex 2**.

Economic Resilience Scheme

101. **The Wildlife Trusts support an Economic Resilient strand however, the Public Good element should receive the majority funding**. The Economic Resilience Scheme should only invest in ecological sustainable production linked to Future Generations Act and nature's recovery.

102. For the proposed programme to achieve their ambitions there needs to be an underpinning of effective regulation so that **payments show positive additionality rather than preventing negative impacts and further declines.**

103. We agree that land managers will need to be assisted in both the transition through Brexit and to diversify. However, this should only be to enable production methods to support sustainable food production.

104. **The Economic Resilience scheme must help rectify and address factors that currently make farms unsustainable and therefore uneconomic**. For example, the business costs of farming and food do not reflect the full social or environmental costs (externalities). Unsustainable practises negatively impact upon the environment, habitats and species, ecosystems and thus the delivery of the ecosystem services.

105. Unsustainable practices ideally should reduce the overall value of what is being produced but they don't, it is society and the environment that is bearing the costs of production.

106. Environmental enhancement on farms is economic resilience. **As such, this scheme should pay for measures that enable certain environmental enhancements. These include**

[59] http://burrenprogramme.com/

[60] Conference on Results Based Agri-environment Payment Schemes (RBP001) http://publications.naturalengland.org.uk/publication/6186745217679360

a) **Organic farming subsidies** / or conversion to organic

b) **capital grants to reduce ammonia emissions and nutrient losses to water** across all farming sectors, including through more efficient and integrated nutrient management.

c) **Measures to increase soil health and soil biodiversity**. This is because it is not clear that soil this is a public good. A good farmer will be looking after the soil because it is in their interests to do so in order to make them more productive and profitable. However, soil needs to be maintained at a standard which has a high biological diversity and carbon content. Measures that support farmers to increase soil health will reduce their dependence on external inputs which has both soil and wider biodiversity benefit as well as financial benefit.

d) **Mandatory nutrient budgeting** - the use of soil sampling and nutrient analysis can provide the evidence farmers need to change practice.

e) **Pollinator friendly buffer strips** along watercourses to reduce pollution

f) **Conversion to more sustainable farming systems such as agro-ecology**. Agroecology[61] which is based on applying ecological concepts and principles to optimize interactions between plants, animals, humans and the environment while taking into consideration the social aspects that need to be addressed for a sustainable and fair food system.

g) **Integrated Pest Management (IPM)** is part of agroecology. IPM applies an ecosystem approach to crop production and protection that combines different management strategies and practices to grow healthy crops whilst at the same time minimising the use of pesticides. A major advantage of using a combination of tools rather than relying on one form of control (i.e. commercial pesticide products) is that it lessens the chance of pests becoming resistant through selection pressure[62]. Many inorganic fertilizers are also fossil fuel based or are non-renewable[63]. Thus, if Wales, and the Welsh farming sector, are to decarbonise and enable creation of a 'Globally Responsible Wales' this must be a priority. For example, Cornwall Wildlife Trust Upstream Thinking farm advisors found a farm near Penzance had been applying phosphate in the same quantities for several generations. Soil testing demonstrated surplus phosphate in every field and eventually the farmer was convinced to reduce inputs. He now applies 80% less phosphate which equates to 700kg less phosphate applied each year without reducing yields.

h) **Farm accounts** - creating farm accounts which help show profit and loss, including highlighting the point where, due to variable costs, additional livestock actually decreased profitability. This would put farmers in the driving seat and encourage best practice. **The wide scale absence of farm accounts and the subsequent inability to analyse fixed and**

In 2015, the Land Use Policy Group examined the role agroecology can play in raising yields and minimising environmental impacts whilst using less land. The report compares agroecological and conventional systems in terms of energy and GHG emissions, biodiversity, soil and water, profitability and productivity and found that agroecology could maintain or improve the performance of agriculture in all these elements; providing a beneficial tool for combating climate change, improving the natural capital of the UK and producing food. Lampkin, N.H., Pearce, B.D., Leake, A.R., Creissen, H., Gerrard, C.L., Girling, R., Lloyd, S., Padel, S., Smith, J., Smith, L.G., Vieweger, A., Wolfe, M.S., 2015. The role of agroecology in sustainable intensification. Report for the Land Use Policy Group. Organic Research Centre, Elm Farm and Game & Wildlife Conservation Trust

[62] For further detail please see Scottish Wildlife Trust pesticides policy here: https://scottishwildlifetrust.org.uk/wpcontent/uploads/2016/09/002_322_pesticidesv2_1449073255.pdf

[63] Phosphorus and Potassium are both mined from depleting mineral sources and the Nitrogen is pulled from the air using large amounts of natural gas or coal.

variable costs, yields and revenues from diversification is a barrier to increasing sustainable production and resource efficiency. If business owners cannot understand where they are making or losing money, then genuine analysis is impossible

i) **Skills and Continuous Professional Development** where payment will require land managers completing a level of accreditation, such as 'Green Cert'[64] that incorporates training in biodiversity, soil conservation, farm accounting including profit and loss, farming for water and natural flood management.

[64] Authority, T.-I.T.A.a.F.D. *Green Cert*. Available from: https://www.teagasc.ie/education/teagasc-colleges/botanic-gardens/green-cert/

ANNEX 1 - HALTING THE LOSS OF BIODIVERSITY BY 2020

a) To deliver on both the Well-being of Future Generation and the Environment Act we need to shift from environmental decline to environmental growth in Wales.

b) The following aspects are areas that need addressed if we are halt the loss and reverse the loss of biodiversity (many of these areas were highlighted in the 2011 Sustainability Committee Inquiry into biodiversity in Wales).

a) **Leadership**- Across Government, and even within the Environment Departments, biodiversity has historically not given the level of priority compared that other areas received such as climate change and waste. The reason for this is likely that the lack of

I. targets and

II. consequences/penalties for not delivering.

During the development of the Environment Act, Welsh Government refused calls for both, citing instead that environmental justice would either be by way of Judicial Review or appealing to public bodies sense of embarrassment for not delivering on their legal duty. Obviously, there are significant drawbacks on both these paths.

There continues to be a failure to integrate biodiversity across all areas within Government and within public bodies. This has led to conservation organisations having to spend a significant amount of time reconciling paradoxes in Government policy and taking / threatening costly Judicial Review (i.e. the M4 Relief Road) instead of undertaking positive conservation work.

We need other departments within Welsh Government to tackle the loss of biodiversity seriously – an attempt has been made with the National Resources Policy, but we are yet to see this translate into significant contributions from these other sectors. Every sector needs to understand that it has a contribution to make. Government's aspiration to halt biodiversity loss needs to be reflected in the current work of all Government Departments, agencies and public bodies.

We need to establish targets, sub-targets and action plans for biodiversity for all Government Departments and public bodies to ensure the integration of target across Government and to which Welsh Ministers and public bodies are held to account. This will increase the pressure on government to address them.

b) **Investment –** A lack of investment in biodiversity contributes to the failure to halt biodiversity loss. There has never been a funded strategy to achieve natures recovery in Wales.

We need a strategic approach to funding delivery for nature, targeting priorities and identifying innovative private and public sources of finance in addition to traditional sources.

We need to look at using all funds to achieve this target – for example, the regulations required to require retailers to donate their single use carrier bags to environmental good causes has never been enacted.

A major way to maximum the resources to undertake this work is to truly embed the 5 Ways of Working by developing long term equal partnerships between government, private, academic and third sectors. In this way resources can be pooled and long-term planning can enable the

attraction of other sources of funding. The present funding models (master and servant) do not work as they are not long-term, integrated, preventative, collaborative and therefore not preventative.

c) **Biodiversity Commission and Commissioner** - Wales should have an independent scientific advisor – a Biodiversity Commission and Commissioner. The Commission would shine a light on whether the health of nature is improving or continuing to be undermined – and scrutinise all plans and policies from public bodies to assess whether they are delivering a Resilient Wales and section 6 and section 7 of the Environment Act. A new body would help to make nature's contribution to society more visible. It would become easier to integrate nature and nature-based solutions into government decision-making.

d) **Environmental Governance** – As we leave the EU, we face a pivotal moment and we have a choice. Things could get even worse; we could fail to adequately replace the important EU bodies that enforce our environmental laws, setting our nature on the path to even steeper decline.

Wales failed to set biodiversity targets and set a system of environmental governance within the Environment Act, leaving the only recourse for environmental justice being expensive and adversarial judicial review. The burden of policing the Environment Act therefor falls on organisations such as environmental NGOs if a public body did not deliver against their statutory duty to enhance nature.

We need to replace the enforcement currently provided by The European Commission and the European Court of Justice which between them investigate complaints from the public, stop unlawful activity and, where necessary, take legal action. This should be a key principle of access to justice and so should not cost the compliant and be accessible to all citizens. Perhaps a new Biodiversity Commission should be given the powers of a new environmental watchdog.

e) **NRW** – Wales needs a strong, independent and well-resourced statutory nature conservation organisation in order halt the loss of biodiversity. However, there is a shortage of biodiversity conservation staff at a local level and this is constrained by the amount of financial resources it has. We feel that NRW's environmental and conservation advice, specialisms and expertise are being eroded which reduces its ability to maintain and enhance biodiversity. NRW is also hindered by continuing low staff morale.

To halt the loss of biodiversity, NRW need to succeed in the following areas which they are the competent body for, that is

i. regulate, monitor and enforce the environmental policy and legislation including objecting to inappropriate planning applications

ii. manage the public estate to maximise biodiversity gain

iii. apply nature-based solutions to problems such as natural flood management including having a significant proportion of their flood defence budget given to nature based solutions.

iv. enhance their nature conservation expertise including in areas of planning and legislation

v. champion biodiversity research and monitoring

That should be NRWs primary purpose. It should not be the role of NRW to achieve sustainable development in its entirety but to contribute to it by delivering a healthy natural environment that contributes to sustainable development and therefore the well-being of society and the economy

NRW needs to show clear, strong and strategic leadership to halt the loss of biodiversity. It also needs to be adequately resourced to deliver against its nature conservation objectives.

f) **Statutory targets for biodiversity recovery including to restore and maintain our designated sites**.

To halt the loss and then maintain and enhance biodiversity and the resilience of ecosystems, we must use designated and non-designated sites as centrepieces for a landscape scale approach to halt the loss of biodiversity. They are important basis upon which conservation of biodiversity in Wales should be built. However, we need to restore the wider countryside around them as well.

Therefore, we should refresh the biodiversity targets within the Wales Biodiversity Strategy 2006 for the restoration of nature and make them legally binding. Without legally binding targets we will continue to fail to stop the loss.

These targets should include

- **i.** all sites of international, Welsh, **and local importance** are in favourable condition to support the species and habitats for which they have been identified by 2026
- **ii.** increasing biodiversity by 15% by 2050 with interim targets

This includes the Local Wildlife Sites (LWS) (which might be called Sites of Importance for Nature Conservation (SINC)) system. These sites can be as important for nature as nationally-recognised SSSIs, providing habitat and corridors for wildlife to live and move across the landscape. We believe that all LWS should be included in any new scheme. They are valuable stepping stones in ecological networks, which are at the heart the Lawton Review[65].

Professor Sir John Lawton stated in a seminal work 'Making Space for Nature' that we need the current network of sites needs to be "more, bigger, better and joined". That means managing current sites better and increasing their size; enhancing the ecological connections between sites; creating new sites; and reducing the pressures on wildlife by improving the wider environment.

As our European sites contain marine sites, actioning the above targets will also contribute to securing an Ecologically Coherent Network (ECN) of Marine Protected Sites.

[65] Lawton, J.H. et al., 2010. Making Space for Nature: a review of England's wildlife sites and ecological network. Report to Defra. Available here: http://webarchive.nationalarchives.gov.uk/20130402170324/http://archive.defra.gov.uk/environment/biodiversity/d ocuments/201009space-for-nature.pdf

g) **Landscape Scale** – We need to work at a landscape scale – and create Government backed landscape scale projects throughout Wales for species and habitats – using Living Landscapes[66], Futurescapes[67] and Back from the Brink[68] as examples.

Largescale working reduces fragmentation and isolation of populations, improves interconnectivity and supports more resilient biological communities with higher populations and greater genetic diversity.

We know that smaller patches of habitat can act as 'stepping stones' and 'corridors' between bigger areas. This means creating and looking after features like hedges, ponds, streams, small woods and meadows to provide habitat and make it easier for wildlife to move through the landscape. However, larger areas are much more likely to enable better ecosystem functioning and may well offer additional benefits in access to management resources and economies of scale.

Landscape/catchment scale initiatives delivered through widespread engagement in agri-environment schemes (or alternative instruments supporting on-farm land management activity) including collaborative farmer-led alliances

We want to work in partnership with NRW, Welsh Government, other eNGOs, landowners to create and fund significant landscape partnerships.

It's worth noting that Christie et al (2011)[69] estimated the value of ecosystem services delivered by the UK Biodiversity Action Plan are estimated at £1.36 billion**. It was estimated these benefits would increase by a further £747 million annually if expenditure were increased to allow full delivery of the UKBAP targets, giving total annual benefits amounting to £2.1 billion per annum**. This compared to estimates by GHK (2010) of the costs of UKBAP delivery which amounted to £837 million per annum. The largest benefits were for climate regulation and water regulation.

h) **Sustainably manage our marine environment** - Rural pollution, such as sediment and nutrients from agriculture practices affects rivers and bathing waters in Wales and both macro and [70] [71] [72]micro plastics from diffuse pollution often end up on Welsh beaches. The health of Wales' marine environment is, therefore, clearly linked to agricultural activities, necessitating a truly ecosystem-based approach to the design and implementation of biodiversity measures, from catchments to the Welsh offshore area median line.

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[66] http://www.wtwales.org/living-landscapes/living-landscape-schemes-wales

[67] https://www.rspb.org.uk/our-work/conservation/landscape-scale-conservation/

[68] https://naturebftb.co.uk/

[69] Christie M, Hyde T, Cooper R, Fazey I, Dennis P, Warren J, Colombo S and Hanley N (2011) Economic Valuation of the Benefits of Ecosystem Services delivered by the UK Biodiversity Action Plan. Report to Defra – downloaded here

[70] Luca Nizzetto[*†‡], Martyn Futter[§], and Sindre Langaas (2018) Are Agricultural Soils Dumps for Microplastics of Urban Origin? *Environ. Sci. Technol.*, **2016**, *50* (20), pp 10777–10779

[71] https://ieep.eu/uploads/articles/attachments/3a12ecc3-7d09-4e41-b67c-b8350b5ae619/Plastic%20pollution%20in%20soil.pdf?v=63695425214

[72] De Souza Machado, A., Kloas, W. et al. 2018. Microplastics as an emerging threat to terrestrial ecosystems. Global Change Biology, 24 (4): 1405-1416

Just like terrestrial habitats, we need to map of ecological networks in the marine environments, and work to enhance the condition and coherence of Wales' network of protected sites, as key measures.

Wales needs to achieve Marine Strategy Framework Directive target of an Ecologically Coherent Network of Marine Protected Areas (MPA) by 2020. This requires the sustainable management and monitoring of these sites. Wales needs to designate further sites to complete our network especially in the offshore. The conservation status of our MPAs is unknown.

England intends to

- designate further sites and to look at a whole site approach to management
- select key sites to undertake detailed monitoring

Wales needs to adopt this approach as only site features are considered presently.

The intention is also to achieve good ecological status of seas between MPAs. Wales needs to invest resources in terms of staff and finances to achieve the above.

i) **Reinstate natural processes in our landscapes / Nature Based Solutions –** We know that climate change will result in more extreme weather meaning our infrastructure, resources and people need protection from storms, flooding and drought. However, engineered solutions require high levels of raw materials and release emissions in production and construction of defences. These solutions can also be costly and may have unintended consequences; for example, concrete flood defence just shift the problem downstream.

However, the Pitt Report in 2008, which was a response to devastating floods in 2007, stated that flood risk cannot be managed by simply building ever bigger hard defences. Softer approaches that reinstate natural processes in our landscape are often more sustainable; they complement and extend the lifetime of more traditional defences. **Restoring habitats to a previous use or ecological state can benefit the local area and wider ecosystems can reduce flooding risks, store carbon, filter pollutants, and create habitats for wildlife**. There are also economic benefits from eco-tourism, and health and social benefits from recreation opportunities.

Working with Natural Processes (WWNP)[73]**.** and Natural Flood Management is a form of flood risk management that can be implemented on hill slopes, rivers, floodplains, estuaries and coasts. A wide range of techniques can be used to reduce flood risk by slowing and attenuating flow while achieving other benefits. For example,

- restoring peat moorlands, woodland in the headwaters and targeted woodland planting - can intercept, slow, store and filter water. This can help reduce flood peaks, flood flows (from 3 to 70%) and flood frequency.
- re-meandering rivers - making a river more sinuous can reduce flood peaks, water velocities and attenuate flow by slowing and storing flood water
- improving floodplain connectivity and restoring functioning floodplains
- restoring rivers and removing redundant in-channel structures

[73] Working with natural processes to reduce flood risk
The evidence base for working with natural processes to reduce flood risk
https://www.gov.uk/government/publications/working-with-natural-processes-to-reduce-flood-risk or see 1 page summaries https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/654440/Working_with_natural_processes_one_page_summaries.pdf

- installing or retaining large woody material in river channels
- land and soil management measures
- creating rural and urban sustainable drainage schemes
- restoration and management of sand dunes, saltmarshes and mudflats
- managed realignment
- re-introducing natures engineers, beavers. Wales is the only country in the Britain that beavers have not yet been official reintroduced.

These techniques can be used in combination with more traditional hard engineering options.

However, we are aware that from **NRWs flood defence budget less than 1% is spend on nature-based solutions –** even though NRW are part of the multi-agency that in 2018 published **"Working with Natural Processes"[74].** NRW needs a better balance of funding between hard and natural flood solutions. These techniques can be used as part of the Brexit and out Land processes.

It is worth noting that South West Waters invested £9.1 million between 2010 and 2015 in habitat management. **The estimated benefit-to-cost ratio was 65:1 with the project providing**, not only improvements to the environment, but also aiding South West Water by **improving the natural storage of water and reducing pollutants, thus avoiding the cost of building new large-scale filtration facilities with their associated chemical and energy implications**[757677]**.**

j) **Stop the destruction of natural habitats –** habitat destruction is the process in which natural habitat is rendered unable to support the species present. In this process, the plants and animals which previously used the site are displaced or destroyed, reducing biodiversity**.** Habitat destruction is mainly for the purpose of harvesting natural resources for industry production and urbanization. Clearing habitats for agriculture and urbanisation is the principal cause of habitat destruction.

Habitat destruction is currently ranked as the primary cause of species extinction worldwide. It is a process of natural environmental change that may be caused by habitat fragmentation, geological processes or by human activities such as the introduction of invasive species, ecosystem nutrient depletion and other human activities. In the simplest terms, when a habitat is destroyed, the plants, animals, and other organisms that occupied the habitat have a reduced carrying capacity so that populations decline and extinction becomes more likely. Perhaps the greatest threat to organisms and biodiversity is the process of habitat loss.

Organisms with limited ranges are most affected by habitat destruction, mainly because these organisms are not found anywhere else within the world and thus, have less chance of recovering. Many have very specific requirements for their survival that can only be found

[74] Working with natural processes to reduce flood risk
The evidence base for working with natural processes to reduce flood risk
https://www.gov.uk/government/publications/working-with-natural-processes-to-reduce-flood-risk or see 1 page summaries https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/654440/Working_with_natural_processes_one_page_summaries.pdf
[75] The Finance Director (November 2011) - Upstream thinking provides a flood of ideas downloaded here
[76] South West Waters Corporate Sustainability Report (2012) - downloaded here
[77] Houses of Parliament Diffuse – Parliamentary – Postnote Number 478 October 2014 - Office of Science and Technology Pollution of Water by Agriculture. http://researchbriefings.files.parliament.uk/documents/POST-PN-478/POST-PN-478.pdf

within a certain ecosystem, resulting in their extinction. Habitat destruction can also decrease the range of certain organism populations.

In order to help local authorities deliver on their statutory duties to halt the loss of biodiversity, they need to raise the importance of biodiversity within their planning system. All local authorities need to have an ecology team which includes, at least a Planning Ecologist and a Biodiversity Manager as well as having a service level agreement with their Local Environmental Records Centre (LERC). The LERC can and should screen every planning application that the Local Authority receives.

k) **Ensure the survival of Welsh species -** One in 14 species in Wales is at risk of disappearing altogether according State of Nature Wales 2016 report.
Wales has a list of the living organisms and types of habitat which are of principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales – the section 7 list of the Environment Act. Section 7 also requires Welsh Ministers to take all reasonable steps to maintain and enhance the living organisms and types of habitat included in this list and encourage others to take such steps.

If we don't take all reasonable steps to maintain and enhance the survival of Welsh species, Assembly members will be the species champions of extinct species.

If we are to halt the loss of biodiversity, we need to seriously look undertaking specific packages of measures to stop species from going into extinction – through funding Back from the Brink[78] type projects.

l) **Create wildlife habitats in our urban areas -** Urban green spaces can provide a multitude of benefits to human urban populations, and a vital habitat for wildlife. It is also proven that the psychological benefits increase and they get more enjoyment with greater species richness of urban greenspaces[7980]. For many town and city dwellers, spending time in urban green spaces is their only regular opportunity to be surrounded by nature. Visitors to green spaces would be willing to pay to see an enhancement in the species richness of plants, birds and invertebrates[81].

Large parks and woodland regions are able to support the widest range of species[82], but even small areas of vegetation such as roundabouts[83], roadside verges[84] and green roofs[85] can support a range of plants, insects and birds. Urban green spaces can act as "wildlife corridors", linking together larger parks, and providing links to rural areas on the outskirts of towns and

[78] https://naturebftb.co.uk/
[79] Fuller, R.A., et al., *Psychological benefits of greenspace increase with biodiversity.* Biology letters, 2007. **3**(4): p. 390-394
[80] Dallimer, Martin, et al. "Biodiversity and the feel-good factor: understanding associations between self-reported human well-being and species richness." *BioScience* 62.1 (2012): 47-55.
[81] Dallimer, Martin, et al. "Quantifying preferences for the natural world using monetary and nonmonetary assessments of value." *Conservation Biology* 28.2 (2014): 404-413.
[82] Cornelis, Johnny, and Martin Hermy. "Biodiversity relationships in urban and suburban parks in Flanders." *Landscape and Urban Planning* 69.4 (2004): 385-401.
[83] Helden, Alvin J., and Simon R. Leather. "Biodiversity on urban roundabouts—Hemiptera, management and the species–area relationship." *Basic and Applied Ecology* 5.4 (2004): 367-377.
[84] Saarinen, Kimmo, et al. "Butterflies and diurnal moths along road verges: does road type affect diversity and abundance?." *Biological Conservation* 123.3 (2005): 403-412.
[85] Gedge and Kadas (July 2005) - Green roofs and biodiversity – page 161-169, Volume 52 Number 3, Biologist http://livingroofs.org/images/stories/pdfs/Biol_52_3_Kadas.pdf

cities. This facilitates the movement of animals, birds and insects between individual green spaces and prevents the fragmentation and isolation of wildlife[8687].

In the UK, urban green spaces form an important habitat for pollinators, such as bees, butterflies and hoverflies[88]. Maintaining a healthy population of pollinators is vitally important as many flowers and crops (including tomatoes, apples and strawberries) depend upon them in order to reproduce. Pollinator populations are declining in the UK[8990] so the provision of viable habitats in urban regions could form part of a broader strategy to combat this trend.

The more green space the better for urban wildlife, but strategies designed to enhance biodiversity will depend on the location, type of habitat and species present[91]. However, some general themes emerge, such as: less intensive management practices, e.g., infrequent mowing of grass; protecting some parts of the green space from human interference, e.g., routing paths away from the most suitable nesting locations to prevent adverse effects on the reproductive success of birds; and the introduction of locally native wildflowers[92].

Therefore, all public bodies must look at enhancing their current greenspaces and creating new wildlife and people friendly wildlife – using the details within Nature Nearby[93] and creating Accessible Natural Greenspace Standards.

m) **Reverse the loss of wildlife on farmland** – the new scheme will not start until 2025. As we have lost 56% of nature in the last 50 years it's not an unlikely prediction that if we continue as we are then we could see significant extinctions and catastrophic impacts from the loss of ecosystem services within the next 30-50 years. In this timescale 5 years is a long time. So, we need to invest in natures recovery today.

We need to look again at how we can make the current system work better for biodiversity – this many include relooking at the EU 'Greening' Options under Pillar 1 and seeing how they can be changed to deliver for biodiversity.

n) **Pesticides -** Although pesticides are known to have wrought considerable environmental damage in the past, there is a perception that modern pesticides are much safer. The European Union (EU) has been promoting reduced pesticide use and increased adoption of Integrated Pest Management (IPM) practices. The EU also introduced a moratorium in 2013 which prevents the

[86] Rouquette, James R., et al. "Species turnover and geographic distance in an urban river network." *Diversity and Distributions* 19.11 (2013): 1429-1439.
[87] Hale, James D., et al. "Habitat composition and connectivity predicts bat presence and activity at foraging sites in a large UK conurbation." *PloS one* 7.3 (2012): e33300.
[88] Baldock, Katherine CR, et al. "Where is the UK's pollinator biodiversity? The importance of urban areas for flower-visiting insects." *Proc. R. Soc. B* 282.1803 (2015): 20142849.
[89] Potts, Simon G., et al. "Declines of managed honey bees and beekeepers in Europe." *Journal of Apicultural Research* 49.1 (2010): 15-22.
[90] Goulson, Dave, Gillian C. Lye, and Ben Darvill. "Decline and conservation of bumble bees." *Annu. Rev. Entomol.* 53 (2008): 191-208.
[91] Großbritannien. Commission for Architecture and the Built Environment. *Making contracts work for wildlife: how to encourage biodiversity in urban parks*. CABE, 2006.
[92] Großbritannien. Commission for Architecture and the Built Environment. *Making contracts work for wildlife: how to encourage biodiversity in urban parks*. CABE, 2006.
[93] 'Nature Nearby' Accessible Natural Greenspace Guidance
http://www.ukmaburbanforum.co.uk/docunents/other/nature_nearby.pdf

use of *some* neonicotinoid insecticides on flowering crops, a measure specifically intended to reduce risks to bees.

Nonetheless there are concerns that the landscape scale, industrial use of multiple pesticides poses risks to the environment that are not captured by regulatory tests which largely focus on short-term studies in which test organisms are exposed to a single chemical[94]. Between 1990 and 2015 the total weight of pesticides used in Great Britain fell by 48% from 34.4 to 17.8 thousand tons per year. In contrast, the area treated almost doubled, from 45 to 80 million hectares[95].

There is widespread concern regarding the health of populations of insect pollinators including domestic honey bees and wild pollinators such as bumblebees. There is clear evidence for significant declines in the abundance and distribution of many pollinators, with some local and global extinctions[96].

New evidence indicates that insects are in catastrophic decline. There is a broad consensus that these declines are due to a combination of factors including exposure to pesticides[97]. Herbicides can have a wide range of non-target impacts including direct toxic effects on non-target species, including soil organisms, invertebrates and vertebrates, as well as ecosystem level effects. But there are also important effects resulting from the intended aim of reducing weeds, which are vitally important food and ecological resources for the other species that inhabit farmland, such as insects and birds. Broad-spectrum herbicide use on farm ecosystems result in the large declines observed in what were once widespread and vitally important farmland species of public concern, including wildflowers, insects and birds[98].

The disappearance of insects is a principal reason why Britain's farmland birds have more than halved since 1970[99]. Some declines have been catastrophic: the grey partridge, whose chicks fed on the insects once abundant in cornfields, and the charming spotted flycatcher, a specialist predator of aerial insects, have both declined by more than 95%, while the red-backed shrike, which feeds on big beetles, became extinct in Britain in the 1990s. A new study showed that the weight of insects caught in the height of summer fell by 82% in nature reserves across Germany over the last 25 years. Professor Dave Goulson of Sussex University, UK, part of the team behind the study stated that "*We appear to be making vast tracts of land inhospitable to most forms of life, and are currently on course for ecological Armageddon. If we lose the insects then everything is going to collapse*"[100].

There can be no doubt that the excessive use of hazardous pesticides are having a major impact upon insects even though it has been shown that significantly reducing rates of pesticides do not

[94] Goulson, Dave, Jack Thompson, and Amy Croombs. "Rapid rise in toxic load for bees revealed by analysis of pesticide use in Great Britain." *PeerJ Preprints* 6 (2018): e26856v1.
[95] Goulson, Dave, Jack Thompson, and Amy Croombs. "Rapid rise in toxic load for bees revealed by analysis of pesticide use in Great Britain." *PeerJ Preprints* 6 (2018): e26856v1.
[96] Goulson D, Nicholls E, Botías C, Rotheray EL. 2015. Combined stress from parasites, pesticides and lack of flowers drives bee declines. Science 347(96229):1435 DOI 10.1126/science.1255957
[97] Goulson, Dave, Jack Thompson, and Amy Croombs. "Rapid rise in toxic load for bees revealed by analysis of pesticide use in Great Britain." *PeerJ Preprints* 6 (2018): e26856v1.
[98] Alternatives to herbicide in weed management - A report from PAN Europe, commissioned by the Greens/EFA group
[99] Hayhow, D.BB. et. al. (2015): The state of the UK's birds 2015. RSPB, BTO, WWT, JNCC, NE, NIEA, NRW and SNH
[100] https://www.theguardian.com/environment/2017/oct/18/warning-of-ecological-armageddon-after-dramatic-plunge-in-insect-numbers

impact upon productivity rates[101]. The **chief scientific adviser to the UK government, Professor Ian Boyd**, recently warned[102][103] that

- regulators around the world have falsely assumed that it is safe to use pesticides at industrial scales across
- effects of dosing whole landscapes with chemicals have been largely ignored
- The current assumption underlying pesticide regulation – that chemicals that pass a battery of tests in the laboratory or in field trials are environmentally benign when they are used at industrial scales – is false.
- Vigilance on the scale that is required for medicines does not exist to assess the effects of pesticides in the environment and that while the UK as an example of one of the most developed regulatory systems: Yet it has no systematic monitoring of pesticide residues in the environment. There is no consideration of safe pesticide limits at landscape scales.
- there is no global governance for pesticides and that the UK has no systematic monitoring of pesticide residues in the environment
- that rather than being used sparingly and only when needed there is widespread use of pesticides as preventive treatments

Professor Goulson research "*suggests that the risks that pesticides pose to bees and other beneficial insects may have considerably increased in the last 26 years in Great Britain, despite a complex regulatory system and a push from the EU for reduced pesticide use and a move towards IPM*"[104].

Without knowledge of safe environmental limits, the amount of pesticides used is governed by market demand rather than by a limit on what the environment can endure. There is little information about where, when, and why pesticides have been used, making it very difficult to quantify potential environmental effects.

Therefore, we recommend that the Welsh Government have a significant review of the pesticide use within Wales both domestically and by farmers and public bodies. This review could look at significantly reducing pesticide use within Wales and promoting approaches to farming and land management that reduce the need for pesticides. The review could look at banning the sales of domestic garden pesticides as this simple measure would have zero economic impact but could have significant ecological impact.

o) **Pollution -** There is no doubt that the current regulatory floor, monitoring and enforcement needs uplifted**.** For example,
   - Research by the National Farmers Union in 2011 indicated that non-compliance with Nitrates Directive requirements may be as high as 45%[105];
   - Analysis of Environment Agency catchment survey data indicated that 90% of observed diffuse pollution incidents did not trigger regulatory action[106];

[101] Lechenet, Martin, et al. "Reducing pesticide use while preserving crop productivity and profitability on arable farms." Nature Plants 3.3 (2017): 17008.

[102] The Guardian (2017): Assumed safety of pesticide use is false says top government scientist. Published 22nd September 2017

[103] Milner, A.M. & Boyd, I.L. (2017): Toward pesticidovigilance. *Science.* 357 (6357) 1232-1234

[104] Goulson, Dave, Jack Thompson, and Amy Croombs. "Rapid rise in toxic load for bees revealed by analysis of pesticide use in Great Britain." *PeerJ Preprints* 6 (2018): e26856v1

[105] Dairy Nitrate Vulnerable Zone Survey, National Farmers Union, February 2011.

[106] Catchment Walkovers; Observations of Pressures on the Water Environment, RSPB, July 2014

- A 2010 National Audit Office review recommended that the Environment Agency take urgent action to raise awareness, target incentives and enforce the legal responsibilities of farmers[107].

The Scottish targeted enforcement model of General Binding Rules was found to be successful in bringing 85% of farmers inspected into compliance[108]. Moreover, farmers and representative bodies viewed the Scottish approach favourably, regarding the process as balanced and fair.

We need to create a regulatory environment that enforces high baseline environmental standards. This can then leveraging additional private sector investment for example, by establishing responsibilities on polluters that can help drive investment. Dwr Cymru/Welsh Water has stated that they will invest significant sums in land management as long as it is over and above regulatory requirements i.e., they do not want to pay farmers to adhere to regulations.

Therefore, we welcome the Lesley Griffiths recent statement she will introduce regulations to tackle agricultural pollution across the whole of Wales to protect water quality from excessive nutrients. The regulations will include nutrient management planning, sustainable fertiliser applications linked to the requirement of the crop, protection of water from pollution related to when, where and how fertilisers are spread; and manure storage standards. We look forward to working with Lesley Griffiths on this issue **however, it is worth the Committee keeping a watching brief on proceedings.**

p) **Air pollution - Farming has been labeled the 'single biggest cause' of worst air pollution in Europe"** [109][110]. The nitrogen compounds from fertilisers and animal waste drift over industrial regions.
Rising ammonia emissions from the expansion of indoor chicken units are thought to be directly damaging many of Wales' most valuable and sensitive wildlife and habitats and
   - 89.4% of sensitive wildlife habitat is suffering from excessive nitrogen levels[111]
   - **93.7% of habitat in European-protected Special Areas of Conservation (SAC) has excessive nitrogen levels** (for at least one species or habitat 'feature')[112]
   - **72.9% of SACs have ammonia concentrations above the critical levels[113].**
   - Nitrogen deposition is having (or likely to have) an adverse impact on 58% of habitat or species features protected on European 'Natura 2000' sites.
   - **Ammonia is partly converted to nitrous oxide, a greenhouse gas 300 times more powerful than carbon dioxide.**

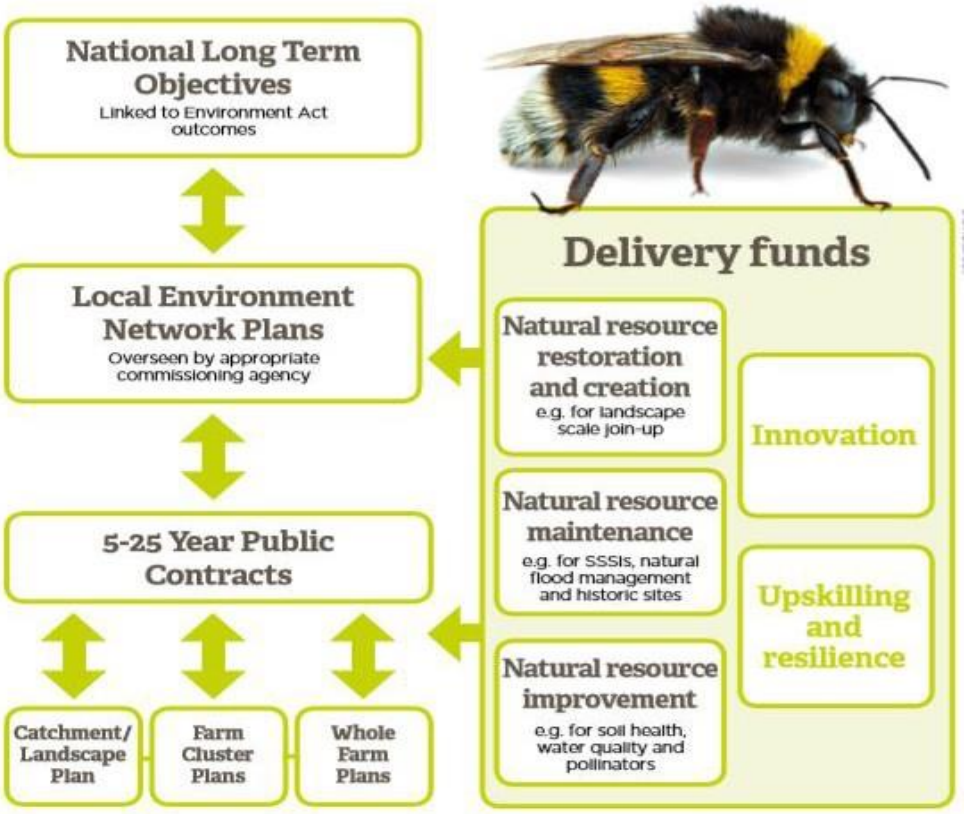
[107] Environment Agency: Tackling diffuse water pollution in England, National Audit Office, July 2010.
[108] WWF (2014) Ensuring Company Operations and Suppliers are Compliant with Existing Water Protection Legislation and Regulations – see http://assets.wwf.org.uk/downloads/ensuring_company_operations_and_suppliers_are_compliant_with_existing_water_protectio.pdf
[109] https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2016GL068354
[110] dhttps://www.theguardian.com/environment/2016/may/17/farming-is-single-biggest-cause-of-worst-air-pollution-in-europe
[111] CEH (2017) Critical Load Exceedance Trends for Nutrient Nitrogen, Centre for Ecology and Hydrology, data downloaded on 23/02/2018 from http://www.cldm.ceh.ac.uk/exceedances/trends/nutrientnitrogen-results .
[112] Hall, J. *et al* (2016) *Defra Contract AQ0826: Modelling and mapping of exceedance of critical loads and critical levels for acidification and eutrophication in the UK 2013-2016 Final Report: 25 July 2016*, available at: https://uk-air.defra.gov.uk
[113] ibid

But despite these impacts, up to 95% of ammonia emissions – from farm animals and fertilisers – are unregulated in Wales. Therefore there needs to be a complete review of how agricultural air pollution in Wales is dealt with, much of it coming from intensive poultry and livestock units. For example, in Powys, 107 planning applications for **intensive poultry units** holding 3.2 million birds were submitted between mid-2015 and March 2018[114] – with only one refused. Therefore, we recommend that the CCERA Committee hold an urgent inquiry into the impacts of intensive livestock units in order to look at the issues with planning, permitting and monitoring and enforcement.

q) **Education** – we need an education strategy which helps as many people as possible (including those from urban back grounds) identify as having a stake in Welsh biodiversity. This will help increase political will to drive biodiversity improvement.

[114] CPRW (2017) *Intensive Poultry Developments*, on the website of the Campaign to Protect Rural Wales – Brecon and Radnor branch: http://www.brecon-andradnor- cprw.wales/?page_id=13

a) **Local Environment Network Plans**: We need local plans that direct action and investment to achieve nature's recovery. Public payments for land management should be targeted and allocated at a local level through local environment network. These should use ecological mapping – a spatial approach to identify societal and environmental needs. Data for national outcomes (e.g. flood risk management, healthy soils, thriving wildlife everywhere) will help identify the key environmental issues which need tackling. This needs-based approach will help to target resources and investment in land management to achieve the greatest impact and value for money.



b) Natural resources funds

We propose that four natural resources funds for land management are core to the new approach and based on delivering a landscape-scale approach to land management which acknowledges that wildlife and wild places do not recognise boundaries and that we need more, bigger, better and joined spaces for wildlife[115].

The funds would support natural resources improvement (e.g. for soil recovery, water quality measures, providing habitat for pollinators), natural resources maintenance (e.g. for SSSIs, Local Wildlife Sites, natural flood management, historic sites) and natural resources

[115] Lawton, J.H. et al., 2010. Making Space for Nature: a review of England's wildlife sites and ecological network. Report to Defra. Available here: http://webarchive.nationalarchives.gov.uk/20130402170324/http://archive.defra.gov.uk/environment/biodiversity/documents/201009space-for-nature.pdf

restoration and creation (e.g. for landscape-scale join-up, creating woodlands, peatlands or wetland.

I. Natural resource restoration and creation payments

This policy specifies measures which will contribute to a **National Ecological Network**. Measures on farms will create and restore habitats and incentivise collaboration between farmers to create connected habitats for example,

- Native woodland creation which delivers connectivity
- Peatland restoration will enhance connectivity of this habitat.
- Implementation of River Basin Management Plans will achieve GES for the majority of water bodies.

This fund could have the **Forestry and Woodland Payments** - The following measures are specified:

- Highest rates of grant support for the establishment of native woodland by planting and by natural regeneration, ensuring natural regeneration is an attractive option compared to planting. Native woodlands are one of our oldest land uses and most diverse ecosystems in Britain. A single oak tree can host 284 different invertebrate species, significantly more than but in comparison the non-native trees[116][117]
- Commercial conifer forests supported to adapt their management regimes to clear riparian and other priority habitats
- Annual woodland stewardship payments to support the management of existing native woodlands.
- Payments to restore plantations on ancient woodland sites to native woodland.
- On the National Forest Estate diversification of tree species and stand structure will be increased year-on-year through restructuring and increased use of native species for restocking.

Having more native trees might also help the dwindling populations of woodland birds, which have declined by 23% since the 1970s. Adding to these frightening declines is the fact that the UK is one of the least forested countries in Europe, with less than 1.4% of ancient native woodland cover, which makes any scheme to substantially increase native woodland cover seem not just necessary, but also urgent.

II. Discrete Challenge Funds - The fund should also include **Discrete Challenge Funds**. These are discretionary fund with a competitive applications process. These funds for land management will be core to the new approach and based on delivering a landscape-scale approach to land management which acknowledges that wildlife and wild places do not recognise boundaries and that we need more, bigger, better and joined spaces for wildlife.

[116] Fahy, O., Gormally, M., (1998). A comparison of plant and carabid beetle communities in an Irish oak woodland with a nearby conifer plantation and clearfelled site. Forest Ecology and Management,
110: p.263-273

[117] Kennedy, C.E.J., Southwood, T.R.E. (1984). The Number of Species of Insects Associated with British Trees: A Re-Analysis. Journal of Animal Ecology 53(2)p455-478

The funds will support natural resources improvement (e.g. for soil recovery, water quality measures, providing habitat for pollinators), natural resources maintenance (e.g. for SSSIs, Local Wildlife Sites, natural flood management, historic sites) and natural resources restoration and creation (e.g. for landscape-scale join-up, creating woodlands, peatlands or wetlands). They will also support innovation (a competitive fund for innovative land management projects) and upskilling and resilience (e.g. business support, education & training, enhancing rural vitality). The new approach will also need to use innovative financial mechanisms to achieve the intended outcomes (e.g. auctions for service delivery, competitive bidding processes and the establishment of new markets).

The following strategic intervention is specified: A Discrete Challenge Fund for

- **Peatland restoration** - of at least £5 million per year for, to be maintained in real terms.
- **Good Ecological Status (GES)** and implement natural flood management - of at least £10 million per year to fund works to achieve, to be maintained in real terms.
- **Designated sites** to maintain, enhance and restore them - of at least £4 million per year to be maintained in real terms.
- **Invasive non-native invasive non-native species (INNS)** control and eradication programmes - of at least £5 million per year to be maintained in real terms
- **Environmental Co-operative Action Fund** of at least £4 million per year to support collaboration between landholdings at the landscape scale, to be maintained in real terms.
- **Integrating stewardship of land and water** - advisory support on land stewardship, and in particular will be extended to all landowners and land managers, funded with a budget of at least £10 million.

III. Natural Resource Maintenance Payments

Designed to ensure that we maintain, rather than deplete, our stocks of natural resources. These are area-based payments (based on Area Statements) for meeting mandatory criteria, which include providing wildlife habitat on at a percentage of every farm.

iv Natural Resources Improvement Payments

Designed to incentivise actions that will help build our natural resources to enable the delivery of a greater level of public benefits and address societal risks such as resilience to climate change. These are area-based payments (based on Area Statements) farms for carrying out additional optional actions. These include

- increasing wildlife habitat by of farm area;
- reducing livestock stocking densities on sensitive habitats;
- conservation grazing;
- wildlife-friendly cropping practices;
- mixed farming;
- measures to encourage pollinators, natural flood management, habitat and species conservation,

- support for specific high nature value (HNV) farming systems

[1] Graves et al The total costs of soil degradation in England and Wales Ecological Economics Volume 119, November 2015, Pages 399-413 downloaded here

Please accept this news article as supplemental to our evidence.

https://emea01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.theguardian.com%2Fenvironment%2F2018%2Fjan%2F03%2Fwildflower-planting-on-farms-boosts-birds-from-skylarks-to-starlings&data=02%7C01%7Cseneddccera%40assembly.wales%7C374b8dd123944b82cbe308d67d73fbb8%7C38dc5129340c45148a044e8ef2771564%7C1%7C0%7C636834334429907343&sdata=ddOnozD1PSzoVz1GpDl6eTfQ3ExNN0H%2FV84DIJjoGeE%3D&reserved=0

Y Pwyllgor Newid Hinsawdd, Amgylchedd a Materion Gwledig | Climate Change, Environment and Rural Affairs Committee
Ymchwiliad Bioamrywiaeth | Biodiversity Inquiry
Ymateb gan : Coed Cadw
Evidence from : Coed Cadw – Woodland Trust

1. Coed Cadw – the Woodland Trust is the UK's largest woodland conservation charity, working for a UK rich in native woods and trees, for people and wildlife. In Wales we have over 14,000 members and 85,000 supporters. We manage over 100 sites in Wales covering 2,697 hectares (6,664 acres). Wales is one of the least wooded countries in Europe, with woodland making up just 14% of the landscape and less than half of this is native woodland.
2. Coed Cadw supports the submission provided by Wales Environment Link (WEL). Our comments below go into more depth on matters of particular relevance to trees and woodland.
3. Paragraphs 5 to 26 summarise the five areas of action we think essential to arresting the current headlong decline in biodiversity. We think the proposed public goods scheme can play a vital part in this, but must be supplemented by substantive action across all parts of Government. Our responses to the Committee's three specific questions are in paragraphs 27to 83.
4. Appendix A provides a summary of evidence on the current state of biodiversity associated with trees and woodland.

Stopping biodiversity decline

5. The widespread and dramatic decline in biodiversity is now well documented, especially in the State of Nature Reports [1] [2] for the UK and Wales. The report by Plant Link UK "*We need to talk about Nitrogen*" [3] summarises evidence on the substantial and rising impact of atmospheric nitrogen deposition on biodiversity. NRW, in their Corporate Plan to 2022 report that nearly two thirds (63%) of our freshwater bodies are not achieving good ecological status.[4]
6. Most of our ancient woodlands and ancient trees have no legal protection and are subject to similar pressures to those that cause biodiversity decline generally. Over the coming decades we will lose millions of ash trees to disease. Nearly one third of our ancient woods, including

[1] Hayhow DB, et al (2016) State of Nature. 2016. The State of Nature partnership. https://www.rspb.org.uk/globalassets/downloads/documents/conservation-projects/state-of-nature/state-of-nature-uk-report-2016.pdf
[2] Hayhow DB, et al (2016) State of Nature in Wales . 2016. The State of Nature partnership. http://ww2.rspb.org.uk/Images/StateofNature2016_Wales_English_1%20Sept%20pages_tcm9-425217.pdf
[3] Plant Link UK (2017) We Need to talk about Nitrogen: Atmospheric nitrogen deposition and its impact on UK wild plant and fungal communities. 20 pp https://www.plantlife.org.uk/uk/our-work/publications/we-need-to-talk-about-nitrogen
[4] NRW (2018) Our Corporate Plan to 2022: Managing today's natural resources for tomorrow's generations. 51 pp https://naturalresources.wales/media/684542/final-corporate-plan-english.pdf

many on the Welsh Government estate, are subject to damaging forestry management and are not under restoration (see Appendix A).

7. We think it is crucial that this body of evidence is fully reflected and further extended in the next edition of the State of Natural Resources Report (SoNaRR).

More quality habitat, everywhere.

8. The objective of biodiversity policy should be **at least a halt in decline** (number and abundance) or preferably achieve an increase in biodiversity **AT A NATIONAL LEVEL**. Any policy which only delivers some site based improvement against a decline at a national level is failing.

9. We think that **more and better interconnected habitat everywhere** is the first and most essential requirement to prevent further biodiversity decline and create resilience. We think that loss, damage and fragmentation, experienced across all habitats, are the most universal drivers of biodiversity decline. All **surviving pockets of mature and ancient habitat**, **such as ancient woodland, must be retained** to provide the core resource on which any expansion and recovery is dependent.

10. Biodiversity **decline is the achievement of our generation**. It has happened in the last 50 years. We should not deprive future generations of their **right to experience wildlife everywhere**, as part of their heritage and for their health and wellbeing.

11. **Our designated sites are a critical resource but are not sufficient**, and cannot be sustained in isolation. All remaining long standing habitat now needs to be valued and protected and to form the nodes for expanded habitat networks.

12. We welcome the Welsh Government's commitment in Planning Policy Wales to the development of **green infrastructure plans.** We think that more substantial interconnected networks of habitat and tree cover need to be universal, across both urban and rural areas.

Action across all parts of Government.

13. The plan to reverse biodiversity decline needs to be **overarching across all Government departments.** We suggest the Decarbonisation Plan as the model to follow.

14. We think that land use, health and economic policies can be aligned to ensure the essential biodiversity **outcomes also secure co-benefits** for climate mitigation, health and wellbeing, water resources, tourism and economic development. Protecting biodiversity has a crucial role in ensuring resilience in the face of climate change.

15. **The Charter for Trees, Woods and People**, encapsulates these cross-sector co-benefits, and we ask that the Charter Principals are reflected in Area Statements and Wellbeing Plans. The Tree Charter is supported by more than 70 organisations and hundreds of community groups and is a practical expression of the ideals and ways of working sought by the Wellbeing for Future Generations Act. [5]

[5] https://treecharter.uk/home.html

Delivery through landscape scale projects, prioritised in Area Statements.

16. We suggest that delivery through **landscape scale projects** is the only mechanism that offers sufficiently wide ranging and substantive delivery, and is the best mechanism to apply the "**nature based solutions**" encouraged by government.

17. **Area Statements** provide the opportunity to identify a number of priority projects in each Area. We suggest that significant parts of the **budget for the Public Goods Scheme** should be assigned to such projects, for example, targeting a large river catchment or regionally distinctive area of landscape.

18. Delivery with landowners we think is best led by **local project officers** empowered to facilitate the preparation of farm and forest management plans and able to allocate budget from the Public Goods Scheme.

19. We suggest that the **Summit to Sea project**[6], covering a 60,000 ha area from top of Pumlumon, down through wooded valleys to the Dyfi Estuary and out into Cardigan Bay, can be used to pilot this approach. We **invite the members of the Committee to visit** and talk to stakeholders in this project.

Enhance our existing wildlife sites as a core resource.

20. By wildlife sites we mean all sites of high biodiversity value, irrespective of whether they have any legally designated status. For woodland this means **all ancient woodland** including Plantations on Ancient Woodland Sites PAWS). Ancient woods are where most woodland biodiversity survives; once the ancient soils that sustain them are destroyed they cannot be recreated.
21. **Most ancient woods have no legal protection**. This is highlighted in the GMEP Final report [7] *"Only around 5% of woodlands in Wales have been designated for their international and national importance to nature conservation and of this only 26% is classed as in a favourable condition."* (p20)
22. We need to **take all of these following actions** in parallel to use our surviving wildlife sites as the seeds for restoration [8] :-

    - **Improve the quality** of our current wildlife sites by better habitat management.
    - **Increase the size** of current wildlife sites.
    - **Enhance connectivity** between, or join up, sites, either through physical habitat networks, or "stepping stones".
    - **Create new sites** and habitat.
    - Reduce the pressure on wildlife by **improving the wider environment**, including buffering wildlife sites and reducing pollution.

A comprehensive response to the drivers of biodiversity decline

[6] http://www.summit2sea.wales/

[7] Emmett B.E. and the GMEP team (2017) Glastir Monitoring & Evaluation Programme. Final Report to Welsh Government - Executive Summary (Contract reference: C147/2010/11). NERC/Centre for Ecology & Hydrology (CEH Projects: NEC04780/NEC05371/NEC05782). P20. http://nora.nerc.ac.uk/id/eprint/518194/ accessed 11.01.19

[8] The Woodland Trust (2018) Our Conservation Principles and Approach. Policy Paper 11 pp http://www.woodlandtrust.org.uk/publications/2018/01/woodland-trust-approach-to-conservation/

23. This is the test of whether the Welsh Government's Nature Recovery Action Plan (NRAP) is fit for purpose. The State of Natural Resources Report Chapter 2 [9]provides an analysis of the drivers of biodiversity change:-
    a. Variability and **change in climate**
    b. Land and sea use change, leading to **fragmentation of habitats** and biodiversity loss
    c. Nutrient **enrichment and pollution**
    d. **Over exploitation** of natural resources
    e. Introduction of **invasive species, pests and diseases**

24. SoNaRR quotes the summary from the 2011 UK Natural Ecosystem Assessment [10] of the impact of these changes on the extent and condition of the main habitat types. We hope that the next edition of SoNaRR will provide a more comprehensive and updated analysis of the condition of habitats in Wales.

25. A pubic goods scheme is essential, but not on its own sufficient, to stop biodiversity decline. **Some drivers of biodiversity decline, for example, climate change and pollution, cannot be addressed by land management interventions alone**. Reversing biodiversity loss requires responsibility and action across Government. This is why we say that NRAP needs be a cross-government plan.

26. Some land management interventions are better addressed by **regulatory requirements** or the proposed **Economic Resilience Scheme**, especially in relation to the prevention of pollution and the reduction of nitrogen and phosphorus levels.

QUESTION 1 How could the Welsh Government's proposed Public Goods scheme, set out in Brexit and Our Land, be applied to restore biodiversity?

27. We support the Welsh Government's commitment to "**public funding for public goods**", and applying the strict economic definition of public goods which does not include products such as food or timber for which a market exists. We think that such a Public Goods Scheme should play a key part in funding biodiversity recovery. We welcome the recognition in the "Brexit and our Land" consultation document that an outcome for the new Public Goods Scheme is *'healthy and functioning habitats and ecosystems'*. (p42)

28. We also support the principle of the Public Goods Scheme being an **outcome based scheme.** The aim should be to ensure that substantive areas of high quality habitat **become valuable assets** which generate a sustained income to the landowner. This suggests that outcomes must not be over-narrowly defined in terms of target species or very specific habitat types, and that incentives have to be sufficient to provide realistic levels of income.

[9] NRW (2016) Assessment of the Sustainable Management of Natural Resources. Technical Report. Chapter 2. Understanding drivers of change in natural resource use. https://cdn.naturalresources.wales/media/682376/chapter-2-understanding-drivers-final-for-publication.pdf

[10] UK NEA. 2011. The UK National Ecosystem Assessment (UK NEA) – Technical report. Cambridge, UNEP-WCMC

29. Our publication "**Sustainable Land Management: How woods and trees can deliver public goods in Wales**" sets out our thinking.[11]

30. We suggest a **multiple ownership premium**, or in some circumstances a requirement, to recognise that the most effective biodiversity interventions will need to apply across adjacent ownerships, for example to ensure habitat connectivity or viability of species management programmes.

31. We believe that the majority of funding under the public goods scheme should **be targeted at farmers and land managers unable to realise substantial commercial income** from farm products and timber. This will particularly benefit diversification and smaller landowners.

32. We support funding for **whole farm / forest management plans** as a means of planning and delivering schemes that integrate farming, forestry and biodiversity, including cross complying regulatory requirements. These should deliver multiple interventions across the whole property.

33. Advisory, technical and peer-to-peer support is essential with **experienced field officers interacting with the site and the landowner**.

34. **Biodiversity outcomes should be funded principally on the basis of the extent and security of features and habitats** rather than on increases in particular individual species. However selected species will be important as quality criteria. The high biodiversity value of ancient woodland derives from the continuity of woodland soil evolution over thousands of years, and much of the conservation value lies in the soil, leaf litter and dead wood. This supports the rich species assemblages that are found in these woods, much of which is in the form of poorly studied invertebrates and lower plants.

35. **Interventions targeted at individual species** should aim to manage sustainable meta populations rather than being focused on individual sites. A good example has been the g pine marten reintroduction programme. The interpretation of species protection legislation hasn't always driven a population centred approach.

36. The **restoration and expansion of surviving areas of priority habitat**, as defined in the Environment (Wales) Act, should be a priority. These habitats, including ancient woodland, cover about 20% of the land area of Wales and are the core resource essential to any biodiversity recovery. Recommended habitat expansion around these core areas could significantly contribute (1,500 ha/year) to the Welsh Government's woodland expansion target. Total cost of restoration and expansion programme estimated at £120 million/year and would be a major part of the Public Goods Scheme.[12]

37. There is currently no public funding support for the management of woodland to deliver public goods such as carbon storage, biodiversity, water resource benefits and recreational,

[11] Coed Cadw/Woodland Trust (2018) Sustainable Land Management: How woods and trees can deliver public goods in Wales. Policy Paper 8pp bilingual. Feb 2018.
https://www.woodlandtrust.org.uk/publications/2018/02/sustainable-land-management-feb-2018/

[12] Rayment (2017) Assessing the costs of Environmental Land Management in the UK. A report for the RSPB, the National Trust and The Wildlife Trusts

health and well-being benefits. This results in **dependence on timber income** which can result in **over-exploitation,** net loss of carbon, and marginalisation of these other substantial public goods.

38. We think the **priority for biodiversity funding in woodland** should be for the **identification, protection and enhancement of high value biodiversity features and habitats associated with ancient woodland and wood pasture.** These are our richest terrestrial wildlife habitat and include the wide variety of other habitats found within with native woodland and wood pasture. Activities sought would include ecological assessment, stock exclusion or appropriate grazing management, invasive species control and restoration techniques such as halo thinning. Payments can be related to outcomes such as the **area under restoration** management and the **status of ancient woodland features** on restoration sites.

39. For **ancient and veteran trees** support should be for assessment and incorporation these trees, and their next generation replacements, into farm and forest management plans, and for meeting requirements of essential care and protection. Payments should be on the basis of the **number and/or area of mature trees secured**, with a premium for ancient trees.

40. To meet the need for **universally available options** we suggest a **substantial farm boundary scheme**, incorporating road and riparian boundaries, and providing a connected **network of dense and wide hedges,** including mature trees, and extending to any associated verge and ditch and wall habitats. Support should be in the form of capital payments and outcome based payments covering fencing, the **retention of mature and ancient trees and hedges**, and an **ash replacement program.**

41. Such agroforestry approaches that actively **promote additional tree cover on farms** through shelterbelts, runoff interception belts, riparian protection zones [13] and other forms of agroforestry, design-in wildlife habitat networks on otherwise intensively managed farmland. They offers long term sustainability through providing some function and fit with modern farming systems and support the farm business and keep "**farmers on the land".** They can also substantially contribute to meeting the Welsh Governments woodland creation target. Agroforestry planting of just 5% of the 1.6 million hectares of farmland in Wales would create **80,000 hectares of new woodland**.

42. In **urban areas** we suggest funding to support **urban tree strategies and assessments**, and public engagement activities that acknowledge the substantial co-benefits from the **retention of mature trees** and meeting a minimum target of **20% tree canopy cover for all urban areas in Wales**. Good examples are the **i-tree Eco reports** now available for Wrexham, Bridgend and Tawe, and currently underway for Cardiff.[14]

43. For new forest creation we suggest that public goods funding should be focused on the **area of native woodland creation** specifically designed to maximise non-market outcomes including water resource management, flood amelioration, carbon storage and biodiversity.

[13] Thomas, S. M., Griffiths, S. W. and Ormerod, S. J. (2016), Beyond cool: adapting upland streams for climate change using riparian woodlands. Glob Change Biol, 22: 310-324. doi:10.1111/gcb.13103

[14] https://www.forestresearch.gov.uk/research/i-tree-eco/i-tree-eco-projects-completed/

Favoured criteria should include expansion and connection of existing native woodlands and use of natural processes of regeneration.

44. Funding should also support the retention and management of **riparian, ride edge and open space habitats** in new commercial forests. The Public Goods Scheme can be used to ensure that **these habitats have value and are retained** and managed in newly planted commercial forests.

Question 2: How could the various existing Welsh Government policies and legislation for biodiversity restoration be applied in the design and implementation of the proposed Public Goods scheme?

Prosperity for All - Economic policy

45. Economic policy should recognise the substantial economic value that biodiversity provides, for example in terms of health and wellbeing outcomes; water resource management; soil conservation; carbon storage; and pollution amelioration. **Natural capital valuations** [15] can be used to quantify these benefits, and ensure they are acknowledged and considered, but cannot put an intrinsic value on biodiversity in itself.

Other aspects of Brexit and our Land

46. We welcome the commitment to the provision of an **advisory service** and think it is important that this is not confined to what options the land manager could seek within a scheme, but rather should enable the delivery of the best long term outcomes.

47. We support the need for **investment** as outlined in the proposed new Economic Resilience Scheme, and want to see this **embedded within a sustainability framework**. Without that, the proposal risks recreating the unsustainable management of land that is currently happening. There is a need for a universal framework or vision for land management for both Schemes to avoid the two working against each other (or one compensating for the damage done by the other.)

48. We call for strong set of **basic regulatory rules**. We are concerned about possible use of public funds provided by the Economic Resilience Scheme to pay for basic regulatory compliance, thus contradicting the "polluter pays" principle. As regards forestry we are calling for the Welsh Government to review the UK Forest Standard (UKFS) – see paragraph 51.

49. We have advocated an **auditable sustainable production scheme** for agriculture, equivalent to UK Woodland Assurance Scheme (UKWAS). Without this, there is no definition of what is sustainable. There are alternative approaches, e.g. based on "earned reputation" leading to lower regulatory oversight. We think such approaches should underpin "**Brand Wales**" as its credibility is dependent on strong environmental standards.

The Woodlands for Wales Strategy

[15] https://www.ons.gov.uk/economy/nationalaccounts/uksectoraccounts/methodologies/naturalcapital

50. The Welsh Government's woodland strategy contains many good aspirations and gives clear indication of the direction of travel sought, for example, that all Plantations on Ancient Woodland Sites on the Welsh Government Estate are prioritised for restoration. We suggest that achieving these objectives requires **commitment to targeted delivery** plans, both within the Woodland Strategy and NRAP.

51. One mechanism we suggest to help achieve this is for the Welsh Government to revise the **UK Forest Standard** (UKFS), which is currently used to screen applications for Glastir woodland grants. A **Wales Forest Standard** could include much clearer, specific and measurable requirements to ensure that forestry outcomes funded by the Public Goods Scheme will achieve Welsh Government policy goals.

52. We support the commitment in the Woodland Strategy, and previous recommendations by CCERA, that the Public Forest Estate should continue to be managed to the much **more demanding and independently audited UK Woodland Assurance Scheme (UKWAS),** and that further adoption of this standard by the private sector should be encouraged. UKWAS certification could be made a **necessary condition of funding under the Public Goods Scheme.**

The Welsh Government's Forest Estate

53. The Welsh Government and NRW have a considerable opportunity and responsibility to manage their own land to reverse biodiversity decline. The intention to do this is set out in many policy statements including the Woodlands for Wales strategy. We think a much higher priority must be given to the practical delivery of good intentions, including the **commitment to substantive delivery targets**. Areas where particular focus is needed to meet published commitments to address biodiversity loss include:-
    - Delivery of the **commitment to restore PAWS** and improve the condition of priority native woodland and open habitats on the Welsh Government woodland estate.
    - Meet the commitment to ensure that woodlands on the estate play their full role in improving environmental quality, particularly **water and soil resources**, at a local and catchment level in Wales.
    - Meet the **commitment to restore priority open habitats such as deep peat** on the estate.
    - Address the deficiencies exposed by the **UKWAS certification** audits of the estate.
    - Provide reports demonstrating timely and significant progress in these areas.

54. The estate should be delivering public goods of most relevance to the people of Wales, not simply meeting a quasi-commercial role as producers of cheap timber. **Re-purposing of the Public Forest Estate** could play a major role in creating habitat networks in some parts of Wales.

The Nature Recovery Action Plan (NRAP)

55. Our comments in paragraphs 7-26 set out what we would like to see achieved by NRAP. We are, with other environmental NGOs feeding into the development of NRAP, particularly emphasising the need to **commit to substantial and measurable delivery targets.**

Decarbonisation plan

56. We suggest that there needs to **be more focus on climate change risks and mitigation** in land use and biodiversity policy, both to protect biodiversity and to achieve the wider economic and social resilience that is dependent on maintaining a healthy environment.

57. We believe that there is now a need, and an opportunity, to align land use and biodiversity policy with the need to protect the very significant **carbon stores in peatland and native woodland**, as well as enabling a significant increase in tree cover. The soil and vegetation carbon store in broadleaved trees and woodland equals or may even exceed that in commercial softwood crops [16], and the carbon store in peatlands greatly exceeds that in all woodland. [17]

58. Our view is that new woodland can and should include new commercial woodland, provided that **forest design addresses climate mitigation needs and biodiversity** and other co-benefits. It is these latter benefits that should receive funding through the Public Goods Scheme.

Planning Policy Wales

59. We greatly welcome the expectations in PPW10 of **Green Infrastructure Plans** and we see the opportunity to create and maintain substantial connected networks of habitats throughout both urban and rural areas. It is vital that these networks incorporate **existing mature habitat, ancient woodland remnants and mature trees**.

60. We wholly **reject the concept of biodiversity offsetting**, which seeks to prioritise economic outcomes by justifying the trading away quality ancient habitat in favour of immature low diversity replacements. **This is not an acceptable approach**. It contributes to biodiversity decline and social inequality[18], and is not consistent with the requirement to maintain and enhance biodiversity in the Environment (Wales) Act. The Future Generations Commissioner has clearly advised that a trading-off approach is not acceptable under Wellbeing for Future Generations Act. [19]

61. We propose its replacement with the principle of **Biodiversity Net Gain**, founded on the protection and retention of all ancient and mature habitats such as ancient woodland and trees. Success requires the retention of existing habitat as core to recovery; new habitat cannot substitute for the continued destruction of ancient habitats.

Roads programme and the National Development Framework

62. Major infrastructure projects contribute to permanent biodiversity decline by destroying mature habitat. Our records show that over the last 10 years such projects have threatened

[16] Forest Research (2012) Morison, J., Matthews, R., Miller, G., Perks, M., Randle, T.,Vanguelova, E., White, M. and Yamulki, S.. Understanding the carbon and greenhouse gas balance of forests in Britain. Forestry Commission Research Report. Forestry Commission, Edinburgh. i–vi + 1–149 pp.

[17] Office for National Statistics (2016) UK Natural Capital: Experimental carbon stock accounts, preliminary estimates.https://www.ons.gov.uk/economy/environmentalaccounts/bulletins/uknaturalcapital/experimentalcarbonstockaccountspreliminaryestimates#biocarbon

[18] Townsend M (2013) Biodiversity offsets - an unnecessary evil? ECOS 34(3/4) 2013

[19] The Future Generations Commissioner (2017). The M4 Corridor Around Newport Public Local Inquiry. Letter to Planning Inspector 13 September 2017.

more than 100 ancient woodlands in Wales, and caused damage and loss in about a third of these cases.

63. Whilst major new infrastructure can be judged to be in the national interest this does not allow impacts to be ignored. Future Generations Commissioner has stressed that a dramatic shift is needed in the way decisions are taken in Wales and it is no longer acceptable to give precedence to economic benefits. We ask that legislators **challenge economic and business models that discount environmental destruction**. Biodiversity decline cannot be prevented unless attitudes change on the destruction of ancient habitats for economic purposes.

64. We suggest that all major infrastructure projects must include Green Infrastructure plans, and use nature based solutions consistent with the **Biodiversity Net Gain** approach. They also should be assessed on what they can contribute to, and how they impact on, landscape scale projects prioritised by Area Statements. We hope that the National Development Framework will demonstrate this approach.

Environment (Wales) Act

65. The Environment Act provides the essential framework for addressing biodiversity decline. We particularly highlight the importance of vigorously applying the Section 6 biodiversity duty and of developing **SoNaRR** and **Area Statements** in a sufficiently determined and focused manner with this objective in mind.

Health Policy

66. We applaud the publication by Public Health Wales of "**Creating healthier places and spaces for our present and future generations**[20]" the to support Public Services Boards, public bodies, cross sector organisations and individuals take forward actions that address and enhance the health and well-being opportunities afforded by the natural and built environment. This fully recognises the value of accessible and well-maintained green infrastructure, open green spaces and blue spaces. It demonstrates the substantial co-benefits that arise from securing biodiversity and illustrates the need for the biodiversity recovery plan to be a responsibility across all parts of the public sector.

67. We suggest that the next step is for Health Authorities and policy makers to accept responsibility for enhancing biodiversity on the health estate and through the activities undertaken to deliver health and well-being outcomes. These for example should include **funding of social prescribing activity** which contributes to the care and appreciation of wildlife sites, such as are run by the Actif Woods project in Wales.[21]

Environmental Governance

68. All of the above policy measures may fail if there is no adequate governance mechanism to provide a back stop to ensure that policy is delivered. We are concerned about the **lack of clarity on the Welsh Government's intentions** on post Brexit Environmental governance.

[20] PHW (2018) Creating healthier places and spaces for our present and future generations 2018 Public Health Wales NHS Trust. 28 pp http://www.wales.nhs.uk/news/49430

[21] https://www.coedlleol.org.uk/actif-woods-wales/our-reports/

69. The value of effective independent oversight is illustrated in Wales by the work of the Future Generations Commissioner and by actions on air pollution that have been forced on governments by legal action. The need is illustrated by the **serial failure to achieve previous biodiversity targets** set by international treaty.

70. The provisions included in the **Draft Environment (Principles and Governance) Bill** represent a weakening of environmental governance post Brexit and do not achieve the UK Government's stated aim of to "strengthen and not simply maintain environmental protection measures when we leave the EU"[22]. The litigation powers of the proposed Office for Environmental Protection are limited to judicial review and there are questions as to whether there are sufficient measures to ensure its independent status. There remains **a great deal of ambiguity** about the geographical extent of UK Government proposals for environmental governance post Brexit and the position of the Welsh Government.

71. We think **a strong environmental governance structure** must be put in place as we leave the EU. Without this we think there will be a further widening of the already substantial gap between actual delivery and the good environmental intention of the Welsh Governments "world leading" policy

Question 3: What lessons can be learned from the Glastir Monitoring and Evaluation Programme (GMEP) to ensure effective monitoring and evaluation of schemes to support the restoration of biodiversity. How should the new Environment and Rural Affairs Monitoring and Modelling Programme (ERAMMP) be designed and implemented effectively for this purpose?

72. There can be two different purposes to monitoring, one being **to track the status of biodiversity in general,** and the other to ascertain **whether public goods scheme interventions are achieving the objectives set for them**. There is a danger that focusing on the later can create a situation in which scheme interventions are judged to be successful in their own narrow terms (e.g x km of new hedge established) but fail to achieve the wider purpose of stopping biodiversity decline.

73. Monitoring to detect trends has to be long term, but there are few such studies. ERAMMP needs to commit to a long term programme and be academically independent.

74. As we state in paragraph 8, monitoring that focuses on demonstrating recovery on individual sites whilst on-going decline continues at national level reflects **a failure in policy**. This is a problem of either unclear objectives (or wrong objectives) or post-rationalising monitoring outcomes.

[22] https://consult.defra.gov.uk/eu/environmental-principles-and-governance/supporting_documents/Environmental%20Principles%20and%20Governance%20after%20EU%20Exit%20%20Consultation%20Document.pdf

75. There are **apparent contradictory messages** between the GMEP conclusions and other assessments, and these need fuller explanation. They may arise from limitations in sampling, time periods and what is being measured.

76. **SoNaRR should provide a framework**, collating and analysing all available information on the overall state of biodiversity in Wales and providing clarity on what Is the particular role and contribution of ERAMMP.

77. There is a considerable challenge in constructing a **sampling regime** that will allow an adequate description of the state of biodiversity. Sampling issues include

    - Biodiversity is not evenly distributed, but is concentrated in "hot spots" such as ancient woodland;
    - our cataloguing of landscape into different habitats is entirely arbitrary and artificial, and means that some characteristic landscapes such as wood pasture and ffridd, and components such as ancient trees, are ignored in assessments;
    - Changes in biodiversity does not necessarily mean decline, creating the difficulties of monitoring against a constantly evolving baseline.

78. **Wildlife is an emergent property of land use**, and inevitably changes as land use changes. A significant increase in tree cover, as envisaged by the Welsh Government's woodland creation aspirations, will benefit some species at the expense of others. This could be an opportunity to create a **future biodiversity** that is more sustainable than the species assemblages that were characteristic of the pre-war farming landscape. Biodiversity recovery indices need to measure absolute diversity rather than change from past locations or species assemblages. We should consider the historic, cultural and geographical heritage from the past without being constrained by it.

79. **Spurious assumptions** can be made about change meaning decline. Succession from open habitats to woodland is a natural process that inevitably changes species assemblages but does not necessarily amount to biodiversity decline. [23] Management interventions in woodland tend to favour light demanding species of the woodland edge and open habitats, but this should not be assumed to "improve biodiversity". Such changes may harm woodland obligate species that depend on shade, high humidity and stable conditions. Such species tend to include lower plants and invertebrates that are much less well recorded.

80. Given these complexities important that environmental NGOs, professional institutes and other specialists **contribute fully** to the design of the ERAMMP programme.

81. There is a need for indicators for both **total range**, area, scale and connectivity of biodiversity; for **total amount** of biodiversity; for **retention of ancient and priority** habitats; for **local distinctiveness** and for **pollution levels** e.g.

    - Invertebrate biomass.

[23] Burton et al (2017) Reviewing the evidence base for the effects of woodland expansion on biodiversity and ecosystem services in the United Kingdom. Forest Ecology and Management 430 (2018) 366–379. https://www.sciencedirect.com/science/article/pii/S0378112718306662?via%3Dihub

- Population levels for suites of species, eg butterflies, breeding birds.
- Species diversity within small target areas of habitat.
- Species that indicate habitat quality – ancient woodland indicator species are a good example.
- Species groups such as bats, which are good indicators of habitat density and connectivity.
- Species groups such as lichens that are good indicators of pollution levels;
- pollinator groups that reflect diversity of nectar sources.

82. Monitoring based on individual species cannot give a sufficient picture, but some species are habitat quality measures and rare species have intrinsic worth.

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Coed Cadw – the Woodland Trust January 2019

APPENDIX A: Biodiversity Decline in Woodland – a Brief Summary

A1. One of the few long term monitoring studies last reported in 2005 and showed a marked decline (32%) in overall species richness of woodland specialist plants since 1971. [24] [25] Sites in Wales are well represented in this study. The Woodland Trust, in partnership with Professor Robert Bunce and the Centre for Ecology and Hydrology, are proposing, subject to funding, to conduct a full resurvey in 2019-2021. This will provide an invaluable 50-year dataset, the analysis of which will provide important insight into changes taking place in the woods and the drivers of those changes.

A2 The State of Nature Report [1] highlights mixed, but predominantly negative, long-term trends in woodland including: that 53% of woodland species have declined and 47% have increased; a 24% long-term decline in the index of change in the abundance and occupancy of woodland species; a 20% decline in the UK woodland bird indicator since 1970; and that 11% of woodland species are threatened with extinction from Great Britain.

A3 State of Nature in Wales Report [2] highlights that species of conservation concern have fared poorly; of the 12 woodland birds listed as conservation priorities , eight have declined in range since the first breeding bird atlas. The ranges of two of these birds – the willow tit and lesser spotted woodpecker – declined by over a quarter.

A4 The GMEP final report [7] however suggests some stability in flora of large broadleaved woods, emphasising the importance of avoiding fragmentation. GMEP monitoring also found "..*an improvement in ancient woodland indicator plant species in large broadleaved woodlands which have increased in the last 10 years. These plants may have benefitted from shadier up*

[24] Kirby, K. J., Smart, S. M., Black, H. I. J., Bunce, R. G. H., Corney, P. M., and Smithers, R. J. (2005). Long term ecological change in British woodland (1971-2001). A re-survey and analysis of change based on the 103 sites in the Nature Conservancy 'Bunce 1971' woodland survey. Final report, Peterborough: English Nature. (English Nature Research Reports Number 653), 139 + appendices.

[25] Wood, C.M., Smart, S.M. and Bunce, R.G.H., 2015. Woodland Survey of Great Britain 1971–2001, Earth Syst. Sci. Data, 7, 203–214. http://nora.nerc.ac.uk/id/eprint/511482/

until 2007 after which no change has been observed. This is not seen in small woodlands." It reports "*…stability in all other condition metrics including connectivity, patch size and light/shade index over the last 10 years, And "an increase in BTO/RSPB/JNCC Breeding Bird Survey (BBS) woodland bird indicator over the last 8 years*."

A5 The apparent contradictory messages between the GMEP conclusions and other assessments need fuller explanation. Biodiversity is not evenly distributed, but is concentrated in "hot spots" such as ancient woodland, and it may be that the GMEP assessment is too coarse grained to show what is happening in such hotspots.

A6 The threats and pressures that drive decline in biodiversity in trees and woodland are not well analysed in the current edition of SoNaRR. Several pressures particularly affecting trees and woodland are highlighted below and Coed Cadw intends to commission further work to improve the coverage of this topic in the next edition. We think the drivers are broadly similar to those affecting all wildlife, but in particular:-

Direct loss and fragmentation

A7 Direct loss and fragmentation of ancient woodland, hedgerows and loss of mature and ancient trees remains a significant issue. The Woodland Trust's own recording of damage to ancient woodland through the planning system has revealed 440 cases of ancient woods threatened since 2000, of which 69 have resulted in actual loss and damage.

Nutrient enrichment and pollution of air, land and water

A8 An evidence synthesis report by the Royal Society concludes that " *Ammonia can also significantly alter the diversity and composition of woodland ground flora and other vegetation*" and notes that "*In small, fragmented woodlands, such as those in the UK, a higher proportion of all vegetation may be strongly affected by ammonia pollution due to all vegetation being nearer the edge*."[26]

Inappropriate management and over-exploitation

A9 The NEA assessment [10] referred to in paragraph 24 highlights "overexploitation" as the most substantial driver of woodland habitat decline. We consider the condition of Plantations on Ancient Woodland Sites to be a particular concern. 34% of ancient woodlands in Wales have been replanted with conifers. The restoration of these sites is highlighted as a priority in the Welsh Governments Woodlands for Wales strategy, but the Woodland Trust estimates that UK wide only 11% of sites are in or committed to a restoration process.[27] No grant funding is currently available for restoration and we still seeing some woods being clear-felled and replanted with another rotation of conifers.

Tree disease

[26] Guthrie, S., Giles, S., Dunkerley, F., Tabaqchali, H., Harshfield, A., Ioppolo, B. and Manville, C., 2018. The impact of ammonia emissions from agriculture on biodiversity. https://www.rand.org/content/dam/rand/pubs/research_reports/RR2600/RR2695/RAND_RR2695.pdf

[27] The Woodland Trust (2018) The current state of ancient woodland restoration. Research Report http://www.woodlandtrust.org.uk/publications/2018/07/current-state-of-awr/

A10 The disease Phytophtera ramorum is currently wiping out larch woodland in Wales. The main biodiversity impact of this is the premature felling of larch woodland, particularly on ancient woodland sites. This is very likely to be deleterious to species dependent on stable woodland conditions. There is no monitoring being carried out of these impacts.

A11 Much greater direct biodiversity impact is certain to arise from Ash Dieback disease. We are already seeing the rapid death of young ash trees in all parts of Wales and the current best estimate somewhere between 50 and 99% of all ash trees will be lost. Ash is a "foundation species" supporting hundreds of heavily dependent and obligate species.

Climate change

A12 Climate change is complicit in driving many changes to biodiversity, with unpredictable impacts expressed through mechanisms such as establishment of new pests and diseases, phenological effects, changes in species behaviours and distributions, and higher risks of catastrophic damage from fire and storms. The Woodland Trust and the Centre for Ecology and Hydrology lead the Nature's Calendar citizen science project which tracks the effects of weather and climate change on wildlife. On-going research projects using the Nature's Calendar data includes studies of the effects of earlier springs on feeding relationships in deciduous forests; of the changing in timing of spring flowering, of oak bud burst and food availability for Great Tits; changing in timing in the availability of buds, flowers and fruit as food for dormice.

Invasive Species

A13 Aggressively invasive species drive biodiversity decline by creating low diversity monocultures. Rhododendron is one of the prime examples having impact on woodlands in Wales. Coed Cadw is one of the partners in the £7.8 million Celtic Oakwoods EU LIFE project running over the next 7 years to control rhododendron in Wales' designated oak woodland sites. This is one example where action focused on designated sites alone cannot be fully effective and £ millions of further funding will be needed to control rhododendron throughout the affected landscapes.

A14 The dominance of low diversity monocultures is a widespread that can be driven by poor management of native species, for example bracken and purple moor grass, or commercial species such as Sitka spruce and western red hemlock.

Coed Cadw – the Woodland Trust

Y Pwyllgor Newid Hinsawdd, Amgylchedd a Materion Gwledig | Climate Change, Environment and Rural Affairs Committee
Ymchwiliad Bioamrywiaeth | Biodiversity Inquiry
Ymateb gan : Laurence Brooks – Ymgynhorydd Ecoleg
Evidence from : Laurence Brooks – Ecology Consultant

1. Restoring Biodiversity

Holistic Approach

1. When talking about general land management, is not practical to distinguish between actions that will benefit biodiversity from actions that will reduce carbon emissions, restore soils, reduce flood risk and other public goods. All of these issues are intrinsically linked and in order to successfully and efficiently deliver on each of those issues, the new Publics Goods Scheme will have to address them together in a holistic way.
2. It is equally important to recognize that this is because public goods are universal to all land and all land types - all have the ability to hold water, reduce run-off, be biodiverse, store carbon and build soils. There are differences in the type and extent of these services each land type does or can deliver but more general land management changes over larger areas are considered far more likely to be effective at delivering the scope of public goods we need than more specific or substantial changes over smaller areas.
3. Whilst WG/the committee may understand the link between all of the public goods, there were some points of the Land Use and Brexit consultation that suggested the need for a holistic approach is not understood. For instance, the wording of Question 13 of the consultation indicated an either/or approach to delivery of public goods - in that instance biodiversity or carbon - which suggests that tree planting would not deliver biodiversity and wetlands would not deliver carbon sequestration. The WG acknowledged that the consultation is at an early stage and we appreciate this second round of input via committee.
4. The practical outcome is likely to affect all aspects of the scheme delivery:
    - Cost - it is highly likely that delivery of public goods in combination will be more cost effective than delivery of each 'public good' in isolation;
    - Delivery - The benefit of certain specific proposals e.g. tree planting over others will not be properly understood if the full range of benefits of tree planting (etc) in general have not been initially assessed. This would skew the types of projects and methods of delivery that may be accepted under the scheme.
    - Coverage - it will affect the ability to meet primary environmental aims (e.g. reduction flood risk) if, for instance, the ability of better grassland management to reduce run-off is not considered in the initial public goods assessment. This will skew the overall targets and the geographic delivery of each public good.

5. Whilst it is not explicitly known to me what shape the new scheme will take, it appears likely from the current information that it will follow similar lines to current/past environmental

schemes in that it will pay for actions through agreed contacts for new works/methods. It is my hope that the committee will be able to see the value of a holistic approach and the ability of this approach to enable a simpler more flexible scheme that will be better able to encourage the various basic moves towards sustainable land management in the cost-effective manner that will enable sufficient area coverage to achieve our aims for biodiversity conservation, flood alleviation, soils etc. Whilst the above three bullet-point aims could be addressed by a holistic approach to public goods, within a prescriptive contract-based scheme (similar to Glastir etc), it is my firm belief that this type of scheme infrastructure can not deliver sufficient change to meet our current significant environmental problems due to the heavy administrative burden, the lack of effectiveness of prescriptive measures and the dislike of the contract/prescriptions due to inflexibility and business/other risks involved in being tied into a management contract. It may be expected that there will be an increased uptake over Glastir resulting from removal of other payments. However, 'forced' update should not be a reason to disregard negative aspects of the scheme for claimants. This would be considered very unfair but also impractical as dislike of the system will inevitably mean that payments need to be higher to attract uptake, will harbor resentment and will hinder engagement with the aims of the scheme - and it is primarily this engagement that will result in the best practice that will deliver the real-world environmental services gains we need.

6. The Publics Goods Scheme should not aim to provide specific publics goods and thereby hope to increase the general sustainability of land use; it should aim to increase the general sustainability of land use, understanding that this is what delivers the public goods we need.

Biodiversity Delivery

Geographic Scale and Coverage

7. Specifically considering biodiversity as a public good, the key issue is the current ubiquitous nature of biodiversity decline. Current biodiversity loss is happening in all geographic areas and across more or less all types of species. In order to have a substantial impact on this issue the Public Goods Scheme needs to have a significant geographic coverage. Assuming that significant funds will be moved from the removal of 'Pillar 1' to 'Pillar 2' environmental schemes, this may be achievable, though this assumption is not entirely supported by the WG consultation information.
8. As stated above, it is considered that simpler changes in land management over larger areas will better improve biodiversity than larger changes on disparate holdings and I would advise habitat management be the core method of delivery (see below).
9. In terms of the widescale nature of biodiversity loss, it is important to consider Principle 5 of the WG scheme - universal access to the scheme - should not be harmed by the framework of the scheme itself. There is a large but limited amount of money available and as well as needing to be efficiently used, the allocation of set payments by contract would inherently place an upper limit on the number of applicants. As a separate issue, the prioritization of Glastir Advanced, both in terms of qualifying criteria (all geographically restricted) and the prioritization of larger holdings, currently excludes many potential contributors. Whilst there are reasons for both, the first issue is arbitrary and the second, more inherently unfair, and both could be removed. As the administration costs of any scheme requiring detailed works prescriptions, detailed contracts and detailed compliance checks is likely to be similar to the existing rather high costs of Glastir, a fundamentally different simpler system should be considered, if only to increase coverage (though there are other benefits). A market-based

approach of flexible and results-based payments, whereby additional public goods delivery proportionally reduces payment rates would create a balanced, flexible and non-arbitrary upper ceiling on payment costs - with land managers effectively competing for public goods delivery (in line with an idea of env.economist Dieter Helm). A flexible but stable uptake/coverage level for the scheme would develop around general payment rates but importantly no land manager would be excluded from entry at any level.

Methods of Biodiversity Delivery

10. We would recommend that delivery of habitat be the basis for all payments. Habitat is the single, true and reliable reflection of the delivery of the whole suite of public goods we want to support. It is also easily assessed both on the ground and off - the bulk could feasibly be done automatically and remotely with computer algorithms assessing satellite images - methods currently widely used.
11. There are some effective species-specific measures that could be considered for inclusion - such as skylark plots on arable land - however, there must be consideration of the trade-off against overally scheme simplicity. Also, the place for detailed measures is on nature reserves, what this scheme should deliver is basic biodiversity that means we no longer need to micro-manage in this way. What arable species including skylarks really need is insects i.e. organic management and some arable weeds. What grassland species need is for the majority of grassland to not be ploughed and reseeded. It should be part of the cost-benefit analysis to assess whether to support skylarks through a specific measure or to support them, along with wider arable biodiversity, soils, public health etc through arable habitat measures. Whilst I would generally favour the latter, I believe this is a much less important decision than the fundamental structure of the scheme. It should be based on current conservation aims and cost-benefit analysis.
12. It is considered essential that cost/benefit analysis be applied to all potential environmental measures and that this includes consideration of the intrinsic knock-on benefits to higher organisms, of those measures addressing declines in the fundamental levels of biodiversity: plants and invertebrates.
13. In addition, should more specific measures be offered within the scheme, these need to be sufficiently targeted to species of conservation concern, which are directly affected by land management activities. E.g. there is only a minor conservation benefit to providing bird boxes on most farms, as it is not addressing a particular agricultural impact and as they are used almost exclusively by common species. This reduces the cost effectiveness of the overall scheme and would be better avoided in favour of measures with wider benefits more directly countering land use impacts.
14. There are pragmatic reasons for prioritising fundamental levels of biodiversity: 1. the loss of another bird species from Wales would be very lamentable but would not affect our ability to produce food like the continued loss of pollinating insects; 2. In order to be effective, we cannot continue to treat the symptoms only - the problem of biodiversity is the loss of habitat diversity and structure through intensive land management and that is what the public goods payments need to be aimed at. 3. Payments to encourage/enable sustainable land management will intrinsically benefit biodiversity - but will also meet other public goods aims and the scheme as a whole will be more cost effective and can therefore have a greater area coverage.

2. Policy and Legislation

15. The Environment Act is clearly the most recent and primary piece of legislation around which to base the scheme. This sets out primarily to ensure the sustainable management of natural resources and the specific main objective to restore and enhance ecosystem resilience. It also sets out the duty of all Public bodies to consider sustainability.
16. My recommendation, in line with these aims, is to deliver public goods via payments that widely increase sustainable land management. This kind of payment essentially would offset the reduction in short-term income/vs long-term sustainability that is seen as an unpaid cost in many businesses and limits the sustainable use of primary resources. These are deemed 'externalities' and include e.g. pollution (proper disposal being a direct cost) and over-harvesting (short-term profits being preferred over risk of possible resource exhaustion). The public goods we want to pay for are these wider or long-term benefits of sustainable management that are being ignored in the current economic climate as they are not a sufficient benefit to the land-owner / business. What I recommend is that the public goods scheme truly reflects this situation. In effect the scheme would take the public purse into the marketplace, by offering a payment for these externalities and therefore enabling the widespread uptake of sustainable management that will deliver the public goods as a natural consequence, in same way that past sustainable management had always done until recently. It is more likely that flexible kind of system will see the engagement and innovation that will deliver long-term efficient delivery of both public goods and industry including food and other primary production in a variety of ways, meeting changing societal demand.

3. Monitoring

17. The monitoring of the prescribed/contracted works under Glastir is very admin-based and appears to mainly be done by local government staff rather than specifically knowledgeable personnel. Not to suggest they are not competent for this role but the underlying problem is that this set-up does not assess the real outcomes of the work undertaken - we know that the contract has been complied with but not any actual benefit in terms of biodiversity etc.
18. For instance currently a farmer could enter an improved pasture into no input management, and prove he has met the management prescriptions but actually have no substantive ecological benefit, as it is insufficient time for excess nitrogen to be removed from the soil and more diverse flora to colonise. It would also have resulted in very little change in management practice as the pasture would not need to be fertilized much more regularly than the 5 yr contract span anyway. The compliance monitoring of Glastir cannot record this.
19. I would advise a system where payments are based on actual habitat value that exists for the payment period. That is true payment by results, there is no way of falsifying habitats and there no need for complex record keeping (the land is the record). There is no need for lengthy contracts - landowners would get a cumulative gain in payments the longer they maintain sustainable management but are not tied into it by contract. There is simply a fair gain over time for any beneficial management changes they decide to make and maintain. The monitoring of results under this scheme design is integral.
20. Any successful scheme would have outcomes of works/changes in management that were discernable at the level of populations of species at local and national levels. This is what we need to aim for if we want to see a healthy environment. We are fortunate in the UK that there is already incredibly close monitoring of a wide range of species/groups including birds, butterflies, moths, plants, amphibians, bats and a number of specific legally protected

species. This excellent monitoring base, partly supported by public funds, should be made use of and should be an integral part of the kind of system, with annual information feeding into the calculation of payment rates for different habitat/land use and geographic areas. As an integral part of the scheme, biodiversity information would be used both for planning and for monitoring results.

21. In addition to real-world monitoring of outcomes (be it biodiversity/species or flood risk) a non-prescriptive, habitat-based system would enable the majority of compliance monitoring for the public goods scheme to be done remotely and automatically via satellite imagery and algorithm analysis to determine habitat type of each applicants holding/s. These technologies are in fairly widespread usage elsewhere, would be highly efficient and leave more funds for on-site habitat assessment by suitably qualified assessors - both as random control checks and for any cases where there are discrepancies or doubt in the automated system.
22. The reliability of habitat as a measure of management allows compliance monitoring to be less intensive and more robust and gives more surety of cost-effectiveness through results-based payments. The simple nature of the scheme allows flexibility in the delivery of publics goods, less fear/risk of minor infringements causing contractual problems and no need for interventions such as derogations to be administered. All of this allows a more equal relationship between government and applicant and encourages engagement by all sides.
23. There would be some need for 'ground-truthing' of remote assessment systems early on - to make sure it is accurate. There would need to be an increased use of suitably qualified assessors for a certain level of random/ specific compliance audits, though this cost is likely to be offset by reduced scheme administration generally. The necessary expertise already exists both in similar current roles (e.g. advisors for Glastir advanced / Glastir woodland creation) but also within the private sector: compliance surveys could be contracted out - with costs of the necessary role-specific training almost certainly able to be borne by the trainees.

Environmental Service Payment (ESP) System

This is a summary of a new system to replace agricultural subsidy. The ESP system is holistic and its primary features and benefits are set out below: simplicity, robustness, flexibility, fairness, inclusion, efficiency and longevity.

In line with current majority thinking and indeed free market principles, is anticipated that production and land based 'subsidy' payment would cease and payment would only be for environmental services. This is not to say that agriculturally intensive system would necessarily receive no support, as all land use could deliver certain environmental services without significant cost/time input and often with minimal change towards best practise.

It is habitats that ultimately deliver opportunities for all wildlife and sustainable management practices can be seen in the habitats and habitat quality that they generate. Habitat type and quality is a true reflection of the day-to-day and year-to year management practises and this applies equally to all land-use, from farming to forestry, to road verges and community open spaces.

Simple

The ESP system is based entirely on habitat present for the payment period. This is possible because habitat is a complex but easily identifiable outcome of its land management. Payment rates would be set for broad categories of all types of habitat and broad quality categories of that habitat. This can be applied to everything from grasslands - improved agricultural leys to species rich meadows - to woodland - from forestry plantation to ancient woodland.

The rates would be set based on how that habitat in that locality delivers both onsite and wider scale environmental goods and services including: nature conservation, flood alleviation, carbon capture/storage. The payment rates would be relative and priorities (and therefore payment rate) for habitat delivery in any one location would be determined by factors such as current vs historic extent of habitat, rain infiltration/flood alleviation, carbon capture/storage.

The same simple broad criteria would apply to all land use in all areas and the annual rate of payment is the only factor of the system that would regularly alter to keep step with the gradual change of markets and the environment. These underlying factors would be assessed annually as they slowly change local, national and global priorities. Examples would be global food markets increasing the value of certain crops (changing payment rates required to offset subsequent env. effects) or diminished flood risk in the Severn Valley, reducing the need for payment of woodland, hedgerows etc across that catchment. These changes will be gradual and as measures will be spread across vast areas, rates will naturally alter very slowly, though changes should be capped to guard against large fluctuations of landowner income.

Online farm data already simplifies annual form filling. It is envisaged that landowners would annotate online maps of their holdings as the simplest method of returning management information to government.

Robust

Habitat itself is very complex and importantly is the true and inevitable reflection of all it's environmental and management factors over time. It cannot be falsified and cannot be created overnight. Significant changes in management will have significant effects on the habitat and this will

be evident for long enough to be recorded by intermittent compliance checks. It is therefore very difficult for any applicant to 'cheat' the system and there is no requirement for more difficult proofs of compliance - record keeping, accounting etc or for complex contracts and strict management prescriptions.

The reverse view is also favourable - landowners can be left free to make minor adjustments to management, with no contractual constraint or requirement for prior permission, because minor short-term changes are unlikely to significantly affect habitat quality. Clearly if these changes become adopted longer term then impacts will be observable and this will affect their ESP, however, this remains a fair reflection of management efforts.

Flexible

The main premise of the system acknowledges that there is, and is required to be, a variation of habitat on local, regional, national scales and across different altitudes, seasons etc and that this variety can be encouraged to develop in ways that meet our requirements as a society.

The system does not therefore require landowners to be tied into prescribed management over a set period. Landowners can alter their management at any time, which may sometimes be necessary for their business, for best habitat delivery or reflecting seasonal climatic or other conditions. As set out above, this is enabled by the accuracy of habitat as a reflection of management. Landowners will be able to update their online EPS maps/records so that changes significantly altering any habitats (and therefore lower or raise payments) can be dated and payments adjusted accurately. Any unrecorded changes - particularly detrimental changes, would likely cause a larger reduction than necessary as they would be backdated to a proven point in time.

There is a clear benefit to enforcement of strict prescriptions within current agricultural subsidy schemes - to safeguard or ensure habitat suitability for certain species at certain times. The flexibility of the ESP system may be criticised, for instance, for not being in direct control of habitat delivery/seasonal works etc. However, this criticism would not reflect the negative aspects of strict prescriptions including difficulty, cost and removal of natural variation. The loss of direct control under ESP is possible because the removal of non-environment-linked subsidy money will give ESP the geographic coverage to even out small scale/short-term impacts of landowner decision-making, and it is beneficial in returning natural variation among other things.

Fair and Equal

The simple and robust nature of the system allows and partly results from an even-handed approach from government. The system allows land-owners freedom to take day-to-day/seasonal/annual management decisions. This is not particularly a matter of trust, but simply an outcome of the system being able to reliably record changes in habitat delivery. Given that any subsequent reduction or increase of ESP is fair to both sides, there should be little cause for resentment or dispute arising on either side e.g. from failure to meet contracted targets (by design / error / unforeseen difficulty) or perceived unreasonable strictness from the authority.

This approach would therefore foster collaboration and mutual respect between landowners and government and hopefully help to resolve public concerns about agricultural practises and misdirection of subsidies/public funds.

Cost effective

The simplicity of the system inherently reduces bureaucracy and administration. Whilst compliance under this system does require competent and qualified on site survey during compliance audits, this cost could be borne by private sector and is expected to a) be inherently minimal (due to difficulty of error/fraud) and b) minimised by remote survey (satellite image analysis).

The payment by results approach inherently means that all payment is well directed. There should be negligible scope for unfair or over-payment as the system has a free-market basis. As amount or quality of different habitats is delivered, the relevant local priorities of environmental services / habitat provision, and thus the calculated payment rates, will change accordingly. Those habitats/features that are relatively easy or profitable to develop/maintain will evolve a relatively low payment rate and those landowners best able to manage higher quality habitats will be rewarded with higher ESP rates. As rates are set on local levels this will acknowledge the natural variation in profitability/difficulty or inherent rarity of certain land use/habitat in certain areas.

The flexibility and low administration requirements on the landowner would make ESP more attractive and worthwhile for landowners, reducing resentment and avoidance of uptake and therefore reducing the minimum payment threshold for which landowners would enter the scheme (and therefore overall cost).

Inclusive

The ESP system is designed to cover all land-use and land-owners, with no limits on uptake (small minimum holding area threshold notwithstanding). All land and land-use has the potential to provide environmental goods and services and this can be encouraged without prejudice to any one sector. It is inevitable that larger land-owners have the opportunity for greater cumulative gain from any system, however, under ESP a large holding would only get a large sum if it delivers large areas of habitat. Conversely small landowners would not be restricted to any arbitrary maximum level of habitat provision. There would be no opaque application procedures such as exist for higher level subsidy schemes and any landowner would be free to deliver novel management production practises that deliver both habitat and sustainable productivity. This would hopefully encourage innovation and increase UK productivity whilst benefitting the environment.

The inclusion of all land uses rather than only agriculture would among other things: promote diversity in agricultural production (e.g. ago-forestry); promote forestry and timber/related products from native trees; provide a potential income for rural local authorities who struggle on cost to suitably manage larger land holdings comparative to population/council tax revenue; encourage best practise of land management for highways and similar significant non-agricultural land holdings.

Long-term

The ESP system will not require any intermittent whole-system overhaul, which affects current agricultural subsidy schemes. This provides valuable continuity for both the individuals / companies for which environmental service payments is a necessary income stream and for the wider sectors of employment and production they are part of.

This system is wide in scope and designed to be adjusted annually to keep pace with inevitable changes over time, which would include climatic change, development of new land uses, agricultural technology and crops, commodity prices and biodiversity aims. Some of these factors will change on local or regional scales and this too would be accommodated by the proposed system, as payment rates would be set on a local not a national basis.

Post-Brexit Land-Use Payment Scheme

Laurence Brooks

Summary

This document is intended to set out a basis for an 'public goods' based land-use payment scheme that is designed purely to bring long term sustainability and wider ecological/landscape issues into landowners' shorter term financial strategies and management priorities. Habitat type and quality classes are used as a corollary of all environmental services and the system would pay for habitat on the ground at the time:

- **Reducing administration for landowners and government;**
- **Removing the possibility of falsified records and other compliance issues;**
- **Emphasising government and landowners as equal stakeholders;**
- **Allowing the flexibility required for a permanent system.**

No detailed, intensive rule books and management prescriptions - the system expects landowners to be informed of good, ecologically sustainable practise and deliver it, as applicable to their circumstances and as part of their overall management strategy. Payments will be made for habitat delivered, not for any work done to that end. This differs from the current system that can work at cross purposes and where measures fail to have real impact for simple, avoidable reasons.

Payment rates will differ for different habitats based on up-to-date local environmental priorities, and will change gradually with those priorities (though rate of change may be capped to avoid unmanageable income changes to farmers - gradual change is beneficial for everyone).

No inherent basis in payments - it is considered that subsidies that do not relate to environmental services should be discontinued. It is considered that grants/loans for innovation are a useful enabling factor in developing more efficient and sustainable production and should be maintained assuming that this is meeting these ends and not subsiding machinery etc for unsustainable practise - large scale monoculture etc.

A simple structure of broad results categories, enabling an unrestricted number of habitat/management types that are offered payment support. Current prescriptive payments are negating efforts at best practise and eroding the variety of habitats and management practises that historically made different areas unique. These rules are too detailed to be flexible e.g. to weather and location, often need problematic caveats; are difficult to understand and be followed. The contractual commitment to a 5-year scheme with a weighty rule book is too often a reason for farmers avoiding environmental schemes.

A simple, robust, results-based system has the potential to remove the adversarial nature of current contract/prescription based subsidy schemes. It is hoped the structure of the scheme would allow government and landowners to work as equals, in a system that is simply designed to acknowledge environmental services undertaken without blame or overburdening of responsibility. There will clearly be the need for recompense for erroneous claims, deliberate or not, however, it is far easier for both parties to recognise errors in a simple system; and with regular survey which means regular contact on the ground with the landowner.

Good habitat is too complex to be faked but instantly recognisable to anyone with ecological training, it puts government in a secure position to be magnanimous rather than authoritarian, since results can be easily verified and any errors reliably corrected.

Introduction

As a basic underlying principle, it is considered that land use payments are only justified as a payment for provision of the wider ecosystem services that the society expects of landowners: essentially as a tool for equalising the short-term economic shortfall involved in sustainable land-use practises - as opposed to unsustainable, intensive systems that give short-term economic advantage but cause losses in non-monetary factors (externalities) such as animal health or biodiversity; longer term factors, such as soil degradation; or wider geographic impacts such as flooding and biodiversity loss.

The proposed environmental service payment (ESP) system will address the fundamental cause of decline biodiversity and ecosystem services –unsustainable management practises- rather than isolated symptoms such as species decline, soil degradation etc.

Payment by Results

The scheme would use current habitat as the basis for payments, rather than payments being a method of delivering environmental change, they are directly for services delivered by habitat is already present. There are several significant benefits of this approach:

1. More efficient delivery
2. No restriction in variety of habitat delivered
3. No need for detailed rules and criteria
4. Far greater autonomy/flexibility for landowners - no contractual obligation
5. Simpler compliance testing - though this does require qualified personnel

Payments for existing good habitat is a true measure that inherently favours all the species that utilise those habitats. Habitats achieve good condition through appropriate management and poor habitat condition indicates unsustainable practise - overstocking etc. Some common practises, such as use of chemical fertilizers, reseeding pastures etc may not be seen as poor farm management but in effect they are unsustainable and have undesirable impacts on flood risk, soil condition, biodiversity etc that we are aiming to reduce. The general principle of the scheme is that landowners have the choice: the intensive management can be continued, over all or part of the holding, if preferred - it would simply reduce land-use payments, as those areas would achieve only very low or no payment. The landowner has complete discretion over their own cost-benefit analysis and management strategy.

Under current subsidy systems, works themselves do not necessarily give any ecological benefit and often works can be undertaken at great expense to speed up a process that would be cheaper and better done with no effort. For instance, any sowing or planting is only a way of speeding up a transition from one habitat to another (e.g. ‘woodland creation’). The methods that will eventually maintain the desired habitat (stock exclusion/hay cutting etc) will create the same end habitat over time anyway – with no need for any sowing or planting - and may also create valuable intermediary habitat in the process. The benefit is less cost; guaranteed local genetics and species suitability; and a more natural process and end result.

Biodiversity/ecological complexity takes time to develop and as a result, there are no quick fixes in ecological terms: a field is not instantly more ecologically valuable when it has saplings planted in it, but only as it develops gradually into a woodland over the subsequent 20 to 50 to 100 years. However, during the time the intermittent stage of rank grassland and scrub is very valuable to many species. Similarly hedges are planted currently that are of very little value because a) they are not old enough and b) there is no incentive to go beyond the basic prescription requirement.

Enhancements could be undertaken on a farm scale where each part, in the right place, can add up to more than the sum of those parts. However, at the moment each part is chosen from a set list, implemented in a rudimentary way with no inherent consideration of context or end benefit. The result is that the current measures implemented deliver less than they could for the same effort, area and money.

At the other end of the scale, there are payments for avoidance of farming practises that have been shown to increase productivity, whilst having no impact on biodiversity and other environmental services e.g. manure application on hay meadows. In this way the one-size-fits-all management prescriptions can negate some good land husbandry by good land managers and, as a 5 yr agreement is insufficient time to substantially alter the damage of past intensive management, has little practical benefit when attempting to counter intensive farming.

Under this system, the methods used to manage habitat are chosen by the landowner and if a non-intervention method of for instance woodland creation (natural regeneration) is chosen, payments would include the value of intermediary habitats. This avoids the discrepancy between contract periods being, simultaneously, too long in business terms (to be an attractive commitment to land-owners) *and* insufficient in ecologically terms

I consider the need to commit to large changes for multiple years with the signing of a contract as one likely reason for lack of uptake to past schemes. The lack of commitment to a wholesale change in management would make the scheme more open and accessible to landowners - as they can change management plans gradually over time and include more and more elements of sustainable management as they see what works and how much they can achieve.

Payments based on actual habitat/species currently present will instantly and inherently reward those land managers who have been delivering ecological benefits and services for many years, despite economic pressures, subsidy incentives and social pressures to manage land less sensitively. There may be some dispute from farmers who have altered land use for financial or even past subsidy reasons, however, this is the vagaries of the market to which they have already subscribed; cannot be avoided; and in part-compensation, the new scheme is designed to eliminate any need for any major changes in the future.

It is expected that all farmers and other landowners will be encouraged by a scheme that increases their autonomy and reduces yearly/five yearly administration and doesn't have any need for arbitrary deadlines on applications and delivery. It is recognised that the time taken for some land to achieve a state to which payments are granted may result in a period of little or no payments for some farmers, however there is no practical way around this and it is expected that all farmers can make very quick changes to current management that would not infringe on farm output/running cost but make significant benefits to habitat quality e.g. best practise of hedgerow maintenance or fencing off ponds/watercourses.

At the administration level, results i.e. habitat delivery will be known but also results from ongoing monitoring of flood risk, species populations etc (by Environment Agency/conservation charities etc) will feed into the ongoing assessment of environmental priorities and therefore the payment rates for different habitats in different localities. This has several benefits: focussing spending on current and localised issues; ensuring payments fit the true cost of delivery accurate through supply/demand forces; and limiting the total budget spend for payments; and finally, ensuring the underlying structure of the scheme can remain relevant indefinitely - only payment rates will fluctuate.

Management Strategy

The central ethos of the scheme is to allow landowners completely free rein over their management decisions. Land use payment is merely the mechanism by which to bring currently disregarded long-term and wider geographic benefits into their decision-making process.

Whilst suitable information is and needs to be available to landowners, it is considered that the onus should be on the landowner to obtain any specific information that will help them maximise the benefit of their efforts/holding and their end land-use payments. There is abundance of freely available information on sustainable management. Some landowners may prefer to pay for input to a farm management plan - consultancy services could include:

- Farm management advice: sustainable grazing; drainage; crop management; veterinary input (all these needs will change – usually reduce – as a result of lower intensity management/stocking).
- Ecology survey and an ecological analysis of current management that is beneficial/contrary to conservation aims and opportunities for enhancement based on the land type and surroundings.
- Forestry / other diversification

For larger farms/holdings, very specialist advice may be worthwhile for various subsets of farming practise (many large farms already get such advice) however, for smaller farms and over time is likely that the above broad factors would merge. Farming has been a factor in shaping ecology for thousands of years and it is only recently that farming and ecology have become disparate entities.

This system inherently favours landowners who work with their land because of the feedback between delivery and payment rates. The system reinstates the link to the land and local area for every landowner. It is harder work trying to farm an area in a way that is inherently unsuited to the soil type, climate etc. It is doubly so with conservation – there is no point trying to create a dry calcareous grassland habitat in an acidic bog. Landowners will need to be informed as to what their land would naturally look like, what the traditional land use may be and what might be achievable with different levels of effort. They can then judge whether this can work for them under existing or revised land use/production. This is not as complicated as it sounds - the habitat categories are deliberately broad and most good management practise does not require detailed knowledge of soils, ecology etc - these elements will work through naturally under sustainable management. The knowledge of the landowner will come in maintaining productivity in line with their lands natural conditions and minimising impacts to habitats/environmental services.

Stability is beneficial to farmers and other landowners but it is also a cornerstone of ecological diversity. The aims of implementation are that the scheme be simple, flexible and long-term. The aim for a long-term solution is there to avoid unnecessary bureaucracy, as well as to fit the scheme to the real world – ecology shifts all the time, but ecological principles are unchanging. The scheme needs to operate similarly. It will be a model that is simple enough to become fundamental and ingrained in land practise, but flexible enough to meet any future shifts in land-use, climate, technology and conservation priority. A scheme that does not require major structural changes and new application procedures every 5-10 years takes away the burden of uncertainty, first and foremost, of farmers/landowners having to worry about what will happen after the expiry of their current 5-year contract.

The seeming contradiction in recommending no 5-year, or longer, contracts as the basis of long-term management provision is enabled by the use of habitat as a record; the expected large geographic coverage of the scheme and the realisation that we need a scheme that is continually worthwhile for landowners. We need to accept that it will always be necessary to pay as a society for these public

goods, and for this to work in the long term we need to aim for a scheme that landowners *can* leave at any time, but *choose* to remain in. This will provide the engagement necessary on the landowners part and also, on the part of government to keep the scheme applicable and attractive. This last part may concern members of parliament, however, there should be no concern about escalating costs of land-use payments – under this system, all landowners are essentially competing for efficient delivery to maximise profit. This means that as delivery of certain public goods increases, the payments will decrease, in line with the reduction in that public good as a priority for payment. On the other hand, landowners choosing to decrease their provision of environmental services (e.g. hedgerow maintenance) will be a fair business decision, but one that, on average, is likely to be countered by other local landowners increasing provision due to the subsequent increase in payment rates.

Measuring Conservation Value of Holdings

Semi-natural habitats are used as the basis for payments. For each landowner, the annual payment will be based on the area and quality of all habitats delivered by their holding. Habitat of a certain type and quality will have ecological/biodiversity value but also the value of ecosystem services (e.g. rainwater retention, carbon sequestration) that the habitat delivers. For instance, agriculturally improved grassland is predominantly perennial ryegrass: it has very low biodiversity but also the species has poor root systems and having been ploughed has reduced soil structure, both of which mean it is worse in terms of carbon sequestration, rainwater infiltration and water storage, so increasing flood risks and climate change. Whilst these are complex factors, the use of habitat as a corollary would be reliable and simple and the system of simple broad categories outlined does not give significant scope for error. Each habitat is categorised by quality into one of five categories of increasing payment rate applicable to any habitat type:

- No/negligible value: e.g. heavily fertilised 'improved' land, recently reseeded fields, defunct hedges, dense conifer plantation, non-native species
- Low value: areas with some plant diversity but not a lot. May support/be able to support some declining species (curlew etc) but not be very florally species rich etc
- Moderate value;
- High Value: semi-natural/natural habitat in a good state - essentially as diverse and healthy as the habitat can get though perhaps not including some rare species of that habitat type. (species assemblage will naturally differ based on soils, climate etc and this variety is to be aimed for not discouraged)
- Exceptional Value: areas of very high value that would meet SSSI criteria - age and local character would split this from top end of the 'high value' category.

The complexities would all be dealt with behind the scenes and would not interfere with the simplicity or running of the system for applicants. We have abundant information on all of the necessary factors required to calculate an end payment rate for any one habitat within the above quality bands. For instance, broad-leaved woodland will be comparatively more biodiverse than conifer plantation, however, it may reduce flood risk in a similar way, though impacts of clearfell practises may need to be included; and it may have slightly better carbon storage rates, though the fate of end products may need ot be factored in (toilet paper will degrade back into $C0_2$ far quicker than furniture).

The total area of each habitat present, weighted accordingly for quality of each habitat type, will form the basis of payments for each applicant. It may be possible to include specific minor additions for certain features, such as important veteran trees, significant bat roosts, species of local/national conservation priority. Again, this would be a matter for debate on practicality and cost of

implementation of the overall system. I consider that these additional factors will not be necessary and the additional complexity would not be worthwhile, but that is matter to be discussed by statutory agencies, government and notably, IT consultants who can advise on the deliverability of increasingly complicated systems both for background administration and the end-user interface.

Similarly, it may be possible to identify management issues and reliably define a status of 'improving' or 'declining' and marginally increase/reduce weighting of payments. There can usually be no quick improvement in habitat quality but there can be quick losses, which could be penalised - this veers slightly from the simple 'payment by results' and 'landowner autonomy' principle slightly and is up for discussion.

Importantly it should be kept in mind that this system includes all environmental public goods and that we are not only talking about biodiversity. It is simply that all environmental public goods are provided by habitats – and all habitats provide public goods, and actually it is only the current reduction in their capacity to do so, caused by intensive management, that we are trying to address. Whilst it is true that certain habitats/features deliver more of certain services, for example, woodland with rainfall infiltration or carbon storage, it also provides biodiversity – just as semi-natural permanent grassland has measurable capacity in rainfall storage and carbon storage.

Payment Rates

It is envisaged that payment rates for each habitat type and quality band will be set by an overall assessment of

a) Stable factors - capacity to deliver all the various environmental services (public goods): rainwater infiltration, rainwater storage, carbon sequestration, air quality and biodiversity;
b) Variable factors - dependant on locality and changing over time: conservation priority, such as the Biodiversity Action Plan system; flood risk; and climate change/carbon commitments.

In determining payment rates by area, the 'local area' with similar rates might be county, vice county or more likely a more accurate level determined by IT deliverability, which will avoid artificial county or other boundaries (which would lead to disproportionate differences in pay rates for some border farmers compared to their close neighbours in another county etc). For instance the system may base rates on the 10km around the holding in question.

The payment rate would change over time but there should never be a need to change the habitat categories or any other significant elements. It is expected that the payment rates would change annually but not by more than a small maximum amount (e.g. 5%) to allow the stability for landowners relying on the system for their decision making.

Benefits to Farmers/Landowners

- Greater autonomy
- More stability (no more 5 year contracts)
- Less administration

It is very clear to me that farmers are inherently self-reliant and can and do make things work. Most farmers I know don't want to touch any environmental subsidy scheme because of the complicated rules, but also due to a general anxiety about oversight. The latter cannot be helped but this scheme would deliver all land-management decisions to the landowner with absolute flexibility. The benefit

of monitoring habitat is that keeping strict tabs on short term changes are less important[1] and this means landowners can change management as they see fit, but too intense/regular changes will show clearly in the habitat and therefore the payments. They have all options open at all times, as there is no arbitrary deadlines / management rules that they are tied to. The choice to risk lower payment, for instance by cutting hay early / changing stock levels is one they can make themselves, based on year-to-year circumstances.

The exception to that is that baseline regulations will continue to be necessary to prevent extreme bad practises that would constitute animal cruelty, environmental pollution etc. I would argue the current lowest baseline / cross compliance levels are too low in animal health and pollution terms - often higher standards apply e.g. red tractor etc but these are not mandatory and I would hope that as well as subsidies changes, updated guidance and regulation could ensure that suitable standards are set for all typical farm and other land practise.

It is expected that payment rates will never have to reach the level of fully off-setting the short-term financial loss of reducing stocking rates etc for several reasons. One is that the payments will diversify farm income, creating a more secure income. Another is that less intensive farming will remove many costs at a farm level such as medicines/veterinary bills, seed costs, ploughing and other operations and subsequent wear and tear on machinery, intermittent costs such as drainage – and also would free up much time for farmers. Much time is spent on operations that do not serve an agricultural purpose and that are damaging to biodiversity - such as annual hedge cutting, weed spraying around farms tracks etc. These are currently done out of pride and the costs to the local ecology are not borne by the farmer, who may well be completely unaware of any ecological issue. Rather than regulate for this, farmers can be informed and make a decision to 'tidy' the hedges or take a payment for the wider service the uncut hedge provides.

Application Methods

The land-use payment scheme should be open to any landowner. Farmers are not the only people managing valuable habitat and maintaining eco-system services. There should be no need to pass any test of land being 'in production' or generating income. The income generation/productivity of land is the concern of the landowner and is factored into their own decision making. If they can make a product and profit whilst delivering habitat and ecosystem services, then this is what we are aiming for, but is already favoured on economic grounds and it should not need to enforced. This, said, it would be possible to reduce payments for unmanaged habitats. It would also be possible to increase rates by altitude if it was decided to continue preferential support for upland areas.

In terms of holding size: whilst there would have to be a suitable minimum application/holding area - to avoid the administration cost outwaying payments - this should be as low as possible, as small landowners are often those delivering best in terms environmental services. There are already inevitable economies of scale favouring larger holdings/businesses and the payment scheme should not exacerbate this.

As stated previously, within this system, there is no 5-year contract period after which there may be no new scheme or a new scheme that suddenly changes the management prescriptions - both of which is confusing and demoralising for applicants and counter-productive for all. The current subsidy systems are already moving online and the improved online interface should improve efficiency in the new scheme but in addition, there seems no reason to include annual application deadlines. Applicant's annual payments, processing etc could be run from the date of application.

[1] I.e. a famer might cut a species rich meadow early one year- if it is one year in five or ten, it would not have any significant ecological impact. We cannot and should not aim to control everything.

This should help the administration, given that the current annual deadline creates a huge bottleneck in workload for the administrating body and may factor in problems of delayed payments. This does not seem necessary for an ongoing and mainly electronic system.

There should be no need for crop codes etc - an online map based system could allocate habitat coverage from drop down menus, with relevant summary guidance available as required by the user. Hedgerows, watercourses etc can be drawn on, saved and allocated quality category - all saved changes can be logged automatically in case needed at later date for compliance disputes etc. Should a landowner plough up and reseed a hay meadow at any date, they can make this change on the system and they can be paid for the period up to the ploughing at the better rate. If they do not log the change this may lose them this money as a later compliance check will note the discrepancy and allocate the rate for reseeded land. There can be no discrepancy the other way, as good habitat cannot be created so quickly.

General Principle of Compliance

A diverse habitat cannot be falsified – poor management in one year can be overturned by a couple of years good management but several years bad management will cause a level of decline that is increasingly difficult to claw back. Under this system there is therefore very little need for intensive compliance checks and either way, the landowner has the choice - if their management does not deliver the habitat they are aiming at, then the available payment is reduced.

There is a need for expertise in the person undertaking the land compliance surveys. Habitat will be judged accurately into the four categories very quickly by a qualified ecologist and compliance checks would be very quick without any of the complicated criteria applicable to current compliance audits (e.g. checking farm records, counting bird boxes, measuring sward heights etc). Although the checks would have to be done by a suitably qualified person, as it requires a qualified judgement - this is the necessary cost of having a more open system with fewer rules and complications. There will obviously have to be standard training/guidance for all persons doing the compliance checks so that assessments are consistent, but they would have to be suitably competent ecologists to start with.

It is expected that the vast bulk of basic habitat assessment can be done with satellite imagery. This may not be able to be used to assess habitat quality, but can certainly identify improved grassland, crop types on arable land, scrub cover, woodland types etc and should be able to make preliminary assessment to focus field assessment and identify areas that do not tally with application statements.

Outstanding Issues

Fauna / Rare Species

It would not be possible to incorporate routine/widespread monitoring of birds and other wildlife as part of the scheme and there may be concerns raised that the broad habitat types and quality brackets do not allow for conservation measures for certain species. It is simply the case that this system proposed does not include for specific management for rare species, which will require ongoing direct conservation action (by charities/statutory bodies) in the areas they occur. This system aims, and can only aim, to improve the broader baseline biodiversity and sustainability issues. This has been carefully considered and is not considered to be a major flaw. Sustainable land management practises clearly can maintain biodiversity and the vast majority of native wildlife, with various standard best practises delivering for whole suites of fauna. The only way to roll out this

management cost-effectively, along with removal of payments not tied to ecosystem service delivery, is by paring back administration to vastly increase uptake. The payment rates being based on conservation aims and tied to results rather than actions will ensure real delivery on a practical level and the wider uptake and natural variably of management delivered by the more flexible/less rule-heavy approach will ensure the necessary breadth of species are managed for. Payment rates for each habitat type are designed to be easily and quickly adjusted based on real time monitoring to allow a natural feedback so the system always remains in step with the state of the countryside.

The concern from conservationists could potentially include widespread species like lapwing, curlew and skylark for which direct conservation action (within the scheme) is also probably not pragmatically possible, however, the scheme would favour permanent grassland (rather than reseeded pastures) and discourage drainage, and will work across the board, rather than some fields on a farm only, and therefore it is expected to sufficiently favour these formerly common species even without specific measures. The UK has a greater level of ongoing wildlife monitoring than probably any other country and as a result it would be known very quickly on a wider scale whether the system has good/bad impacts, on birds, mammals, invertebrates etc etc due to ongoing widescale monitoring. Beta diversity of habitat (heterogeneity - e.g. grass tussocks/variable sward length within the grassland habitat) would certainly be a factor in assessing all habitat types, which will also assist many such species. There is the potential to add complexity to the proposed habitat/payment system to include for, for instance skylark squares in arable, but as this would increase complexity at all levels (e.g. landowner/gov admin for applications, mapping, payment rates, species priority for inclusion, survey time) it is deemed this should be avoided if at all possible. This is another factor of the system that requires specialist analysis of capabilities and requirements.

Organics

Use of pesticides clearly has a wider impact and avoidance should be included as a public good. Although herbicide use is more instantly obvious, it is not possible to determine whether insecticides have been used by looking at habitat and therefore organic management needs ot be incoroporated or run alongside this system. Those farms with organic status are already audited separately, and this could simply continue as a parallel system feeding into each applicants annual payments. It could also be partially amalgamated - e.g. it may be possible to bring existing organics certificate bodies directly into the scheme as subcontracted services, as essentially setting up an alternative gov system for land-use payments would be costly and less efficient overall. Or possibly in the long term a national organics system may be an option, though this would be a big undertaking and require merger/acquisition of regulatory arms of existing organic bodies (though not the charity/educational arms which could gain significantly from developing roles within the extended sector of private advisors to farms/landowners). The positives of the latter might include increased efficiency and impartiality (competition between different private regulatory bodies is inefficient and inherently reduces authority and impartiality).

Environmental Protection and Wildlife Law

A significant issue is the management of excellent habitat whilst clearly acting illegally towards some wildlife. For instance, it would be unacceptable that potentially large sums are awarded to sporting estates that are, perhaps clearly but unverifiably, culling rare birds of prey. Whilst there would be clear criteria on the habitat quality of these areas, and whilst many estates would not rate highly even based solely on habitat, it is possible, even likely, that such wildlife crime issues could not be easily identifiable. Specific input would be needed to resolve this conflict of interests within the

system. For instance a widespread GPS tracking scheme of hen harrier may help. Ideally wider changes in policing/prosecution would be made to enable greater prosecution of wildlife crime. Alongside changes to subsidies, an overhaul and improvement of basic requirements on landowners regarding environmental protection and animal welfare should be made to cover all landowners and take over from any obsolete regulatory measures - cross compliance etc.

Expertise/systems

As stated above some expertise/systems in organics is required. This currently exists though may be more efficiently delivered if centralised within the overall land-use payment scheme structure.

The scheme would also require regular compliance checks by skilled ecologists, either working directly for government or as private sub-consultants certified by government. Currently the Government nature conservation agencies employ many office based staff undertaking mainly/entirely administrative roles and it would probably require additional trained field ecologists, as many of these currently employed are experts in specialist fields, whose specific roles would still be required. In Wales ecology sections appear to be reduced following merger into NRW.

There is a wealth of private ecology consultants currently employed with a focus on protected species, created by the strict nature of current planning policy/protected species licensing and it is not considered efficient in terms of cost to conservation benefit (see below). Though the cost is mainly on private individuals, there is also significant gov./local government administration. Leaving EU could reduce duplication of local government (planning) and government (licencing) roles and costs, without reducing species protection and conservation, which may enable costs/staff to be redirected, however, it is likely that use of private sector ecologists would eb required. The existing ecologist workforce may require some retraining to ensure standardisation, however, reliable standard tests already exist for Phase I competence (the main requirement) so recruitment of subconsultants could be very straightforward. Costs for specific training provided by government would certainly be paid by ecology professionals/companies given the level of future work available, so there is unlikely to be an initial cost to government for this.

Remote sensing is expected to significantly reduce costs for auditing checks. This would not negate the need for field ecology in auditing the scheme, but is expected to be able to focus field auditing.

Compliance

There are various options for compliance auditing, which would probably be the primary ongoing cost of the scheme. It is possible though not necessary that audits could be mainly outsourced, and with use of remote sensing, focussed towards sites that are either difficult to remotely assess, or where discrepancies lie between remote data and the application data. A level of randomised on-site compliance checks would be necessary certainly at the outset, though may be able to be reduced in the long term.

It is expected that even full governmental auditing (rather than use of subconsultants) would be efficient, given level of available IT (hand held, touch screen electronic mapping, GPS/GIS linked, with note-making functions) which can reduce reporting time and survey time on site. The end decision will be cost analysis for government and I do not think will alter the efficacy of the system.

Private Sector Involvement

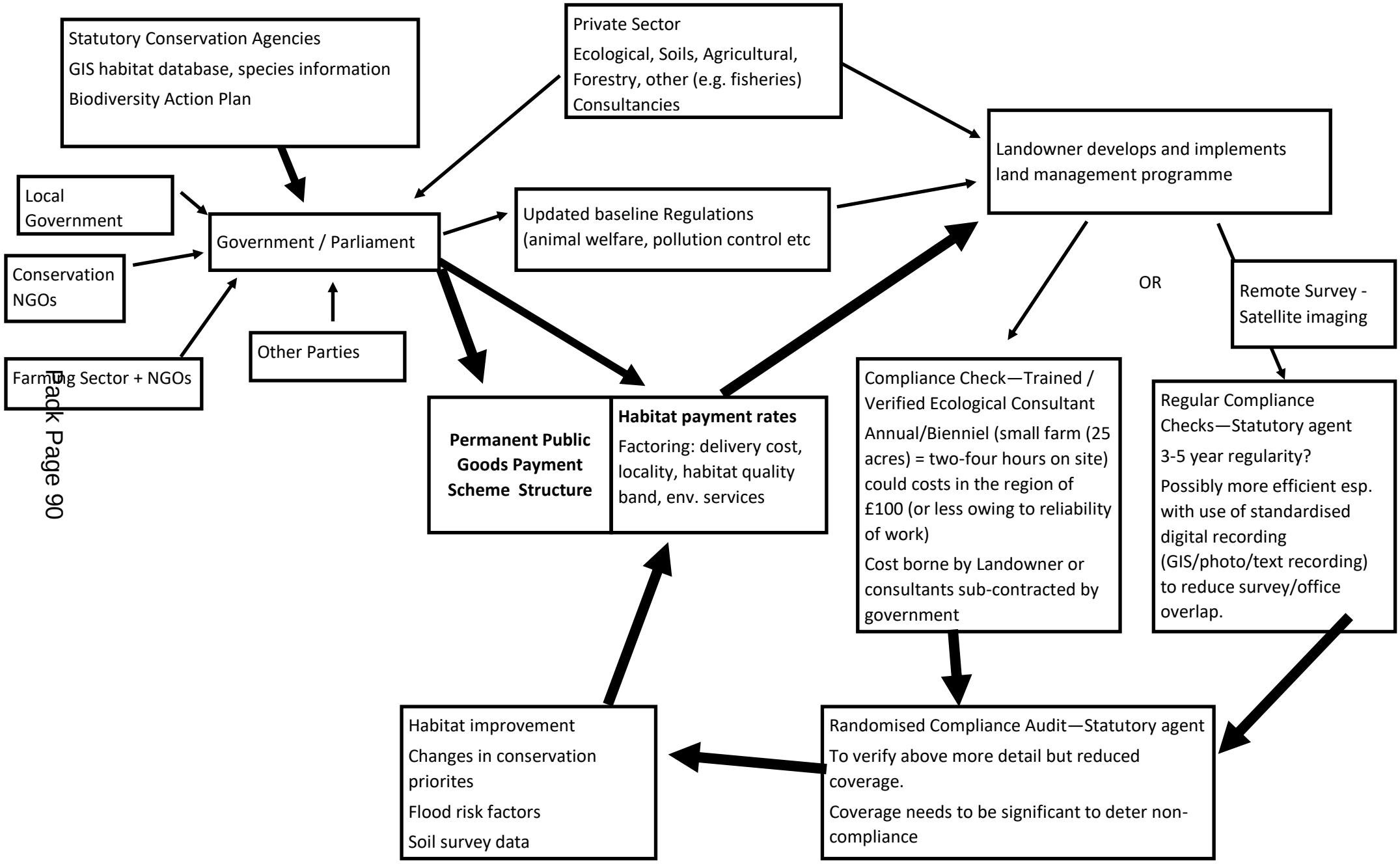
There is currently a resource of private ecological consultancies whose role is overwhelming dominated by in-depth survey for protected species for planning purposes. Whilst this role is valuable, there is currently too much focus on this work, resulting from overly stringent implementation of EU licensing rules. The consequences of this, in practical terms, is that we as a

country spend a disproportionate amount of money on safeguarding the welfare of very small numbers of some fairly common or at least non-declining species, in particular bats - and in a lot of instances this is over-precautionary.

In contrast there is virtually no oversight of farming practises (as far as ecology impacts and except for optional schemes), which have a far greater impact in terms of loss of habitat and species, flood risk, climate change etc. This is due to the inherent difficulty of observing illegal/bad practise actions in rural areas; the unwillingness of rural communities to report instances of crime/bad practise; and poor recording/action by police/CPS with regards wildlife crimes.

It would be far more efficient in terms of expenditure (public and private), and in terms of wildlife/habitat conservation aims, if this inequity was addressed at a strategic level. This could feasibly also link to some reduction in the overlap (without affecting actual protections) of planning and licensing systems of local and national government respectively (though this has recently been started to be addressed and may be more possible after exiting EU).

It is envisaged that the onus would be on landowners to develop their own long-term sustainable management strategy for their land and it would be in their interests to get detailed advice on the natural habitats that their land should/could support that were a) of the highest conservation priority and/or b) could be most efficiently achieved as part of the landowners preferred (production/market led) cropping regime or other land requirements. A wealth of information is available and accessible for free including e.g. many NGOs, SSSI management plans, old BAPs, www.farmwildlife.info. In addition, private consultants from ecological, agricultural, forestry and other specialisms would be able to provide this and could likely do so at efficient rates, given the likely high volume of work available. It is possible that private contractors, certified by government, could also provide annual compliance checks within their local areas, which may enable more detailed statutory compliance audits to be undertaken at a reduced level, reducing costs to gov, though it may be preferable for compliance visits by the statutory agency to be the single method of compliance audit. The benefit of the former would be that every farm could have an annual/biennial check with that cost potentially borne by the landowner; though the latter is likely to be more efficient in terms of overall cost it is unlikely to be able to achieve the same coverage.


Statutory Conservation Agencies
GIS habitat database, species information
Biodiversity Action Plan
Private Sector
Ecological, Soils, Agricultural, Forestry, other (e.g. fisheries) Consultancies
Landowner develops and implements land management programme
Local Government
Government / Parliament
Updated baseline Regulations (animal welfare, pollution control etc
Conservation NGOs
Other Parties
Farming Sector + NGOs
OR
Remote Survey - Satellite imaging
Permanent Public Goods Payment Scheme Structure
Habitat payment rates
Factoring: delivery cost, locality, habitat quality band, env. services
Compliance Check—Trained / Verified Ecological Consultant
Annual/Bienniel (small farm (25 acres) = two-four hours on site) could costs in the region of £100 (or less owing to reliability of work)
Cost borne by Landowner or consultants sub-contracted by government
Regular Compliance Checks—Statutory agent
3-5 year regularity?
Possibly more efficient esp. with use of standardised digital recording (GIS/photo/text recording) to reduce survey/office overlap.
Habitat improvement
Changes in conservation priorites
Flood risk factors
Soil survey data
Randomised Compliance Audit—Statutory agent
To verify above more detail but reduced coverage.
Coverage needs to be significant to deter non-compliance

Likely Broad Habitat Types

Categories could be more precise and extended to include additional categories as needed. 'Quality' bands from negligible, low, moderate high and exceptional value would be applied to each habitat type in the same way (broad quality assessment factors outlined overleaf).

Woodland /Plantation

- Wet/dry
- Native/non-native/mixed

Scrub

Tall Ruderal Vegetation

Grassland

- Calcareous/Neutral/Acid
- Dry/Wet
- Meadow / pasture
- Rough/rank
- Intensive grasslands included but would lose most of above characteristics and would intersect the above categories as a general negligible/low value grassland category

Parkland (grassland with sparse tree cover)

Arable

- Grain
- Horticulture

Wetland

- Ponds
- Fen
- Bog

Heath - Lowland / upland

Hedgerows

Ditches (open only)

Hedgebanks / stonewalls

Broad Criteria for Assessing Habitat Quality

Alpha diversity (species diversity in any given area)

Beta diversity (broader habitat diversity / habitat mosaic)

Habitat structure (e.g. grassland tussocks, deadwood in woodland, hedgerow structure)

Signs of good/poor management (e.g. hedgerow 'knuckles' from repeat trimming, grassland poaching) (only required if determine improvement/decline)

Presence of non-native species and conversely, native indicator plants

Y Pwyllgor Newid Hinsawdd, Amgylchedd a Materion Gwledig | Climate Change, Environment and Rural Affairs Committee
Ymchwiliad Bioamrywiaeth | Biodiversity Inquiry
Ymateb gan : Cyfoeth Naturiol Cymru
Evidence from : Natural Resources Wales

Response from Natural Resources Wales to the Climate Change, Environment and Rural Affairs Committee (CCERA) inquiry into Biodiversity – proposed Public Goods Scheme outlined in the consultation Brexit and Our Land

1. We welcome the opportunity to contribute evidence to the Committee's inquiry into biodiversity and public goods. Natural Resources Wales' core purpose is to pursue Sustainable Management of Natural Resources (SMNR). As part of that purpose, one of our roles is the statutory adviser to Government on biodiversity and resilience of ecosystems. Our response to this inquiry builds upon our response to the "Brexit and Our Land" consultation.

Key Recommendations

- Place ecosystem resilience at the core of the scheme.
- Develop a flexible and adaptive approach.
- Promote biodiversity recovery by delivering resilient ecosystems at a landscape-scale.
- Deliver tailor-made options for species heading towards extinction in Wales.
- Safeguard species and habitats of principle importance to ensure healthy and resilient ecosystem resilience.
- Ensure that land managers are supported in developing business planning which integrates economic and ecological resilience.
- Ensure continuity of support for biodiversity through the transition period.
- Develop a scheme around a clear regulatory floor and sector standards above which payments can be made for additional public goods.
- Incentivise and facilitate collaboration between land managers based on good evidence including the Area Statements.
- Facilitate collaboration between land managers.
- Develop and support a properly funded structure which supports integrated high-quality training, advice and guidance and other services to land managers across business and public good outcomes at an appropriate scale.
- Ensure ERAMMP will provide important data on general trends and allow wider environmental modelling.
- Support additional monitoring to adequately report on rarer habitats and species.

2. Biodiversity is an essential natural resource as it underpins the structure, functioning and resilience of our ecosystems and has wider economic, social and cultural significance. The relationship between natural resources and land-use is fundamental to their sustainable management. The scheme needs to recognise the right things as public goods and this includes all the factors which contribute to healthy and resilient ecosystems.

3. Like much of the rest of Europe, Wales continues to face biodiversity loss. According to the 2016 *State of Nature: Wales* report, of the animal and plant species identified as conservation priorities in Wales, 33% of the species assessed have declined over the past decade, with between a third and a half of the remainder showing no significant improvement. NRW's *State of Natural Resources Report* (SoNaRR) includes assessments of the condition of our Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), the sites subject to the highest level of statutory protection. On Wales' terrestrial and freshwater SACs and SPAs, 55% of species and 75% of habitats are assessed as being in unfavourable condition.

4. Increasing ecosystem resilience will provide significant benefits to other services delivered by natural resources. For example, restoration of wet grassland increases soil water retention to ameliorate flooding or drought, increases soil carbon sequestration and reduces sedimentation and fertilizer run-off to improve water quality in adjacent watercourses.

5. Over the last half century, intensification of agriculture has been the one of the biggest drivers of biodiversity decline across the UK[1]. Effective land management schemes are critical to reversing this biodiversity loss. Reflecting on three decades of experience with the design and implementation of agri-environment and woodland grant schemes, there have been mixed results from previous schemes in relation to biodiversity. The condition of some habitats has been maintained or improved and some species populations have stabilised whilst other habitats and species are still declining.

6. The variation in success is partly the result of uptake. GMEP reported[2] that the condition of Purple Moor Grass and Rush Pasture is improving; 37% of this habitat of principal importance was within Glastir Schemes in 2018. Whereas, the most suitable option for rare arable plant communities (a Critically Endangered, Red List European Habitat in steep decline) covered only 0.08% of arable land in 2018[3].

7. Initial data analysis by NRW shows that over half of the surface area of terrestrial statutory protected sites is currently managed under the Glastir schemes. In some cases, these agreements are delivering appropriate management that is maintaining or restoring the condition of these protected sites. In other cases, the lack of option flexibility under the existing schemes has resulted in sub-optimal management.

[1] Burns F, Eaton MA, Barlow KE, Beckmann BC, Brereton T, Brooks DR, et al. (2016) Agricultural Management and Climatic Change are the Major Drivers of Biodiversity Change in the UK. PLoS ONE 11(3).

[2] Glastir Monitoring & Evaluation Programme. Final Report. Emmett B.E. and GMEP team, 2017.

[3] Glastir uptake figures from Welsh Government, 2018.

Part one

How could the Welsh Government's proposed Public Goods scheme, set out in Brexit and Our Land, be applied to restore biodiversity?

8. The establishment of the contributory principle ("something for something") as part of the "Brexit and Our Land" consultation is an important milestone and provides the opportunity to significantly increase action to halt and reverse current declines in biodiversity. Building ecosystem resilience should be at the core of the proposed schemes if the Welsh Government is to achieve a resilient Wales that maintains and enhances a biodiverse, natural environment.

9. "Brexit and Our Land" provides us with an opportunity to change the perception that delivering for the environment and providing public goods, including biodiversity, is contrary to productive agricultural and forestry systems and as such should be treated as a side-line to a land-based industry. Embedding ecosystem resilience into land-use businesses and recognising that economic resilience of these businesses is significantly underpinned by their ecological resilience is fundamental to long term success and delivery at a Welsh scale.

10. The "Brexit and Our Land" consultation presents regulation, economic resilience and public goods as three separate strands. NRW believes that there are significant gains and benefits, across all-natural resources and especially for biodiversity, if the three delivery mechanisms are integrated, and delivered in a holistic manner.

11. The development of a hierarchy of performance strands that link to the public goods schemes could include the following -

    a) A 'universal regulatory floor' that underpins the Public Goods schemes to act as the minimum standard applied to all land managers that will deliver a basic level of public goods including biodiversity (regulation).
    b) A good practice standard above the regulatory floor to help unlock market access (linking to economic resilience schemes) or to provide assurance of environmental performance including a level of requirements in relation to biodiversity.
    c) The Public Goods schemes would deliver the highest level of standards and provide assurances of sustainable management of natural resources and include high value public goods.

    Throughout our remaining evidence the use of scheme or schemes refers to the combination of economic resilience, public goods and regulation.

12. Delivery at a landscape scale is essential to promote ecosystem resilience. The attributes of ecosystem resilience set out in the Environment Act provide a framework for exploring potential interventions to maintain, enhance or restore biodiversity. Considering each of these in turn with respect to biodiversity within the proposed schemes -

13. **Diversity.** Maintaining and enhancing native biodiversity is central to building ecosystem resilience. Whilst the requirements of rare and localised habitats and species may sometimes be catered for within existing special sites, diversity in a wider sense is fundamental for biodiversity and resilience, for example in increasing structural diversity across landscapes through varied (appropriate) management practices, and diversification of productive systems to increase the representation of native or other suitable species e.g. within swards of improved grassland, conifer plantations. Increasing diversity across landscapes, getting the right thing in the right place, is key to restoring biodiversity and building resilience.

14. **Extent.** Extending the area of habitats through restoration and creation is fundamental for restoring biodiversity and building resilience and appears well accepted within the proposed schemes.

15. **Condition**. A very wide range of activities may improve condition and hence benefit biodiversity and resilience, often in relation to applying more extensive sensitive management and control of pressures such as pollution and Invasive Non-native Species (INNS). With respect to resilience, condition relates to achieving sustainable balances of inputs and outputs, for example of fertilisers or timber. An integrated scheme is ideally placed to deliver this.

16. **Connectivity** relates to movement within and between ecosystems, for example of species or natural processes. Connectivity may be improved through a wide range of activities that may be promoted by the Public Goods scheme. For example, habitat restoration and creation, improvements or maintenance of connective features such as hedges, water courses and field margins.

17. Many of these interventions can be brought together within the concept of a **Resilient Ecological Network**. This is a relatively new term, introduced as a national priority within WG's Natural Resources Policy (2017).

Resilient Ecological Networks have been defined in discussions between NRW and WG as a series of biodiversity hotspots (often represented by protected sites) that are functionally connected, meaning that species are able to move within and between them as required by all stages of their life cycles. This allows shifts in range as adaptation to climate change; as such the networks become more resilient in themselves and help confer ecosystem resilience and enhanced goods and services to the wider landscape. Such networks would be developed by targeted interventions as described above, e.g. diversification, improvements in condition and connectivity.

18. The proposed schemes should support and incentivise the development of Resilient Ecological Networks with the requirement of landscape scale interventions Evidence from both experts (for example, studies of species requirements and NRW habitat connectivity mapping) and local knowledge should be used to target and prioritise interventions. We expect the Areas Statements to be used in support of decision around public good payments.

19. Common Land covers about 8% of Wales and there is high correlation between statutory sites and common land. Targeting collaborative action on common land would help to address multi-ecosystem services including biodiversity over landscape-scale areas of Wales.

20. Recovery of many species will be enabled through appropriate habitat management and consideration of specific conservation need. Most of the examples of species recovery achieved by agri-environment schemes depend upon tailored options. We also know that clear advice and guidance is welcomed by land owners. Consideration should be given to including such components in the schemes for species heading towards extinction in Wales (e.g. marsh fritillary butterfly, lapwing and rare arable plants).

21. There are currently mechanisms within Glastir to prevent unintended damage to habitats and species from the selection of inappropriate options. We would expect to see the future scheme continuing to provide mechanisms to safeguard Section 7 habitats and species of principle importance against inappropriate action.

22. We would also like to explore with land owners all the potential tools to support delivery of public goods, including species reintroductions.

23. The need to deliver a high number of agreements in a short space of time should not drive the level of ambition of scheme outcomes nor the type of scheme developed. It is also important that the transition period is sufficiently long to allow for evidence gaps to be addressed through pilots and trials, for administration capacity to be built up, staff to be trained, for advice and guidance capacity to be developed, and to support land managers to adapt.

24. For a scheme to be successful, it should have sufficient detail and flexibility to cope with the variety and complexity of ecosystems present in Wales. This will take time to develop and trial. To that end, trials and pilots developed through the transition period should focus on the delivery of an initial tranche of core public goods. This time should be used to learn and evaluate. Some outcomes are straight forward to achieve and some are more challenging. It will be important to trial options with varying degrees of complexity and difficulty during any pilot process.

25. If a new scheme cannot be delivered in its entirety by the end of the transition period, it is critically important not to create a gap in protection and management for existing habitats that are either in good condition or improving under existing schemes. The financial pressures on land managers post-Brexit could risk creating incentives for degradation of such habitats. This would be detrimental to biodiversity goals and would also represent a significant waste of public investment. Welsh Government has introduced an intermediary solution by offering contract holders extensions to 2021. If necessary, existing prescriptive agreements should be rolled on further than the current 2021 timeframe to allow time for new contracts to be negotiated.

26. The existing protected sites network is heavily reliant on current agri-environment schemes to promote appropriate management. Should there be a gap in delivery of funding to land managers, there is a strong risk that site condition will be compromised contrary to national and international obligations.

27. A gap in the provision of land management funding for statutory protected sites would almost certainly place increased pressure on NRW's staff and financial resource
available for land management agreements under the Environment (Wales) Act, and a greater pressure on our potential enforcement activities.

28. Within Europe, research evidence shows that there are several key factors that are common to successful schemes[4].These should be given sufficient consideration when designing the Public Goods scheme for Wales.

    Successful schemes:
    - have been specific to a region and carefully adapted to the local farming practices and environmental conditions;
    - have a considerable element of landowner training;
    - are well resourced with knowledgeable project officers who offer good landowner support and can monitor outcomes;
    - provide facilitation for development of cooperation; and • have pilot periods to fine tune targets and payment rates.

29. 'Payment for results' models are typically far more successful at achieving the desired outcomes than prescriptive schemes but they are often more complex, have incremental payments and use high levels of support, training and monitoring. Such detailed approaches should be considered for the more complex or technically demanding elements. More technically challenging schemes could be gradually rolled out across geographic regions, allowing Welsh Government, land managers and delivery partners to develop experience and understanding and to work in an adaptive and iterative manner as required by the Environment (Wales) Act.

30. Managing land for biodiversity and other public goods can be complicated and land managers who have access to expertise do better than those who do not[5,6]. For the schemes to be successful it is essential that advice and guidance, training and support for the development of experience are available as an integral part of the scheme. These should also be in place and widely available before the scheme is launched to encourage uptake. It is essential that this aspect of the scheme is adequately resourced, both financially and in terms of skill-base. It should also

[4] Keenleyside C, Radley G, Tucker G, Underwood E, Hart K, Allen B and Menadue H (2014) Results-based Payments for Biodiversity Guidance Handbook: Designing and implementing results-based agri-environment schemes 2014-20. Prepared for the European Commission, DG Environment, Contract No ENV.B.2/ETU/2013/0046, Institute for European Environmental Policy, London.

[5] Department for Environment, Food & Rural Affairs. (2013). Review of Environmental Advice, Incentives and Partnership Approaches for the Farming Sector in England.

[6] Boatman, N., Short, C., Elliot, J., Gaskell, P., Hallam, C., Laybourn, R. & Jones, N. (2015). Agreement scale monitoring of Environmental Stewardship 2013-4: assessing the impact of advice and support on the environmental outcomes of HLS agreements.

acknowledge that specialist support will be required to deliver some management, e.g. recovery of certain species. The Welsh Government should collaborate with NGOs and NRW to source such expertise.

31. Agreements should be based on assessments at an appropriate scale. This allows for an expert assessment of opportunities and options based on knowledge of both the local environment and the land-use business.

32. The promotion of collaboration between land managers will be fundamental to achieving resilient ecological networks. This will require facilitation to promote collaborative uptake. There are several delivery models that have already been used to this end. Learning the lessons from all of these is vital in moving forward. These include trusted facilitators (agri-sgop), technical expert facilitators (LIFE), independent facilitators (Sustainable Management Scheme and Common Development Officers[7]), as well as bringing together land based industries with the same issues (Farm Clusters and management groups, e.g. Dartmoor Farming Futures, Pontbren Farmers).

33. The two criteria needed to satisfy "additionality" in "Brexit and Our Land" need to be considered further to allow elements that require deliberate non-intervention to be eligible for payments. Options such as woodland natural regeneration can provide multiple public goods, including a significant benefit to biodiversity and carbon sequestration. Under the current criteria, excluding livestock may not be considered appropriate management.

34. Enhanced payments should be provided for measures that provide multiple benefits and/or support landscape scale opportunities, e.g. native broadleaved woodland creation that is in a location where it could intercept flood water and increase woodland connectivity, should attract higher payment rates than woodland creation in isolation. In this way, well-designed scheme payments could encourage land managers to target their actions to achieve the greatest multiple benefits.

35. There would be significant advantages from integrating any woodland creation element with other aspects of land management. An integrated scheme would encourage woodlands to be considered as part of the whole farm agreement, as well as management of open space as part of a woodland agreement. This would increase the likelihood of establishing new woodlands in appropriate locations and Section 7 habitats included within proposed woodland creation areas could be maintained as open habitat.

36. Invasive non-native species (INNS) pose a significant threat to ecosystem resilience in Wales through impacts such as displacement of native species, habitat loss and change of community structure. Including INNS management within the public goods scheme could contribute significantly to addressing INNS as it would enable widely spread INNS to be tackled at appropriate spatial scales (i.e. catchment level) and could also be used to deal with INNS at an early stage of infestation to prevent

[7] http://www.ccri.ac.uk/glastir/

them from spreading and taking hold in the first instance, thereby reducing the impact and economic burden of control.

37. Both development and delivery of an effective scheme will be complex and technically challenging. An objective assessment needs to be undertaken that focuses on opportunities and options for delivery models which will best achieve the joint outcomes that NRW, Welsh Government and others in Wales seek. To ensure success, it is critically important that personnel with the appropriate skills and experience are involved at all stages of development and delivery. Sourcing these skills will require collaboration with NRW, NGOs and others. Given its expertise, NRW should have a core role.

Part two

How could the various existing Welsh Government policies and legislation for biodiversity restoration be applied in the design and implementation of the proposed Public Goods scheme?

38. Brexit and our land does not only provide an opportunity to redesign payment systems to enhance the wider benefits land brings to Wales and support the delivery of our unique legislative framework, it also provides the opportunity to assess how these support systems are undertaken and delivered. Once the constraints of the EU regulations are removed, the current wording of the UK Agricultural Bill with the Environment Act (Wales) 2016 allows Wales to determine the most appropriate delivery model for our unique legislative framework.

39. The following briefly reviews the range of relevant WG policies and legislation and reflects on how they may relate to schemes developed as part of "Brexit and Our Land", and especially to the delivery the interventions described in Part 1.

40. Welsh Government has set out its commitments for biodiversity in the Nature Recovery Action Plan for Wales (NRAP). This recognises that a key requirement of SMNR is to ensure that, through the underpinning principle of resilient ecosystems, Wales can continue to deliver its key UK, European and international obligations for biodiversity.

41. The objectives of the future scheme need to fit within high level policy contexts. Wales is committed to the vision of the Convention on Biological Diversity's (CBD) Strategic Plan for Biodiversity 2011-2020: 'By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people', with its mission to take urgent action to halt the loss of biodiversity'.

42. The Well-being of Future Generations Act recognises the importance that the Welsh Government places on ecosystems and therefore, nature and its biodiversity, primarily through the 'Resilient Wales' goal. Biodiversity can contribute to the six other goals that make linkages from a biodiverse natural environment to social and economic benefits.

43. The Environment (Wales) Act (2016), Part 1, is of particular relevance. It recognises the essential contribution biodiversity makes to the sustainable management of natural resources and to our well-being by putting in place the Section 6 duty that requires public authorities to seek to maintain and enhance biodiversity in the exercise of functions in relation to Wales, and in so doing promote the resilience of ecosystems. This key duty should also be reflected in the design and implementation of any public goods scheme and, as has been described in Part 1.

44. The list of habitats and species of principle importance set out in Section 7 of the Environment Act provide a useful basis for outcomes within the proposed scheme and we recommend that this list is closely aligned to its development. The scheme should seek to deliver actions to maintain and restore all relevant Section 7 habitats and species.

45. This sits alongside existing legislation designed to protect our most threatened species and habitats (Wildlife and Countryside Act 1981, Countryside and Rights of Way Act 2000 and EC Habitats and Birds Directives). Statutory sites, designated under this legislation represent a critically important biodiversity reservoir. This importance has been recognised by weighting within Glastir. The proposed scheme should continue to prioritise protected sites and build upon them to create Resilient Ecological Networks.

46. The Natural Resources Policy contains three high level priorities: nature-based solutions, resource efficiency and place-based working. We have set out our thoughts on how a focus on building Resilient Ecological Networks can enable the scheme to deliver for biodiversity through these in Part 1. We have mentioned the resource efficiency elements in relation to measures supporting economic resilience in our response to "Brexit and Our Land". We reflect further on place-based working below.

47. The third element of the SMNR framework is Area Statements. Area Statements have the potential to be an evidence base in the development and delivery of a more innovative and flexible schemes. They will provide spatial information to support the identification of opportunities for delivering ecosystem services, and resilient ecological networks. The collaborative way in which Area Statements are being developed offers the opportunity to build and connect with local networks, gather additional information that may be specific to a locality, contribute to the development of potential supply chains and share sources of good practice in relation to sustainable management of natural resources. All of these will be important in supporting collaborative uptake and targeting other forms of investment and income for land managers (for example, tourism).

48. Whilst Area Statements are new and under development, they offer a major opportunity to be part of the architecture of land management in Wales. Any trials or pilots to develop the scheme should address the question of how Area Statements can provide evidence, advice, support and facilitation to enable the delivery of the proposed scheme.

49. We are committed to working with Welsh Government to explore how this can be done in a way that drives outcomes for biodiversity and other public goods, whilst facilitating place-based, innovative and flexible approaches required to get the best outcomes for Wales.

50. There are many policies and plans which have commitments where the expectation of delivery is placed on the public goods scheme. For example, Welsh Government's Woodlands for Wales Strategy (2018) contains many commitments and statements about desired outcomes that are relevant to biodiversity and the scope of a future Public Goods scheme. In relation to biodiversity, it contains commitments to prioritise native woodland species when restoring planted woodland on ancient woodland sites, the need to manage the negative impact of pests and diseases, and the need for strategic approaches for dealing with the impacts of INNS in woodland. Analysis of these expectations should be undertaken when defining the outcomes of the schemes.

51. UK Forestry Standard (UKFS) is the reference standard for sustainable forest management in the UK and provides a model for the development of other land use standards. It sets out the approach of the UK governments to sustainable forest management, defining standards to ensure regulatory compliance and good practice. It is relevant to all public, private and third sector managed forests and woodlands. There is nothing similar for other land use types in Wales but if there were, these could be linked to the delivery of the proposed schemes. There are specific biodiversity guidelines within the UKFS which could inform the design and implementation of a proposed Public Goods scheme relevant to all land use types in Wales, for example:

    - Manage a minimum of 15% of the forest management unit with conservation and the enhancement of biodiversity as a major objective.
    - Ensure wetland features such as springs, flushes and bogs are protected.

Part three

What lessons can be learned from the Glastir Monitoring and Evaluation Programme (GMEP) to ensure effective monitoring and evaluation of schemes to support the restoration of biodiversity?

52. It is important to acknowledge that GMEP had a much wider remit than just biodiversity reporting, and so necessarily had to focus on selected aspects rather than giving a comprehensive picture across all biodiversity. However, it did provide information across a range of habitats and species, which (if monitoring is repeated) are likely to allow general signals of biodiversity change to be detected. It is worth noting that GMEP included recording of soil biodiversity, a very important but generally under-recorded aspect of biodiversity.

53. The field-sampling strategy, using a landscape-based stratified sample of 1km squares, will have influenced the evidence gathered on biodiversity, as more sampling was undertaken of common land-uses and habitats than of rarer habitats and associated species. The real power of this approach is the potential for repeat sampling of biodiversity within a consistent sample, allowing changes to demonstrated with statistical confidence.

54. Changes in biodiversity may occur (or only become detectable) over long time periods. GMEP recognised this, and much of the information recorded is considered to be a baseline to allow changes to be detected in future monitoring events (as well as providing continuity with historic monitoring programmes). Coupled to this is the use of modelling to help understand these long-term processes and responses of biodiversity to environmental change. This appreciation of the time-scales involved in ecological processes, the vital importance of maintaining consistent long-term monitoring, and the value of targeted modelling are key messages to take from GMEP.

How should the new Environment and Rural Affairs Monitoring and Modelling Programme (ERAMMP) be designed and implemented effectively for this purpose?

55. ERAMMP should provide evidence that will support Sustainable Management of Natural Resources (SMNR), in particular as a key source of evidence for the State of Natural Resources Report (SoNaRR). It is anticipated that ERAMMP will also contribute to a broader range of domestic and international reporting requirements relating to the environment, biodiversity, and natural resources.

56. Recognising the above, we would like to see the design and subsequent delivery of ERAMMP aligned with the reporting framework for SMNR developed by WG and NRW, which is based around the sequential flow of evidence between SoNaRR, the NRP and Area Statements. NRW are also developing a suite of four key measures for reporting the success of SMNR and we expect these also to align with, and to use evidence collected by ERAMMP.

57. On the question of designing and implementing ERAMMP for biodiversity reporting, we would note that for the large part the field-survey element is now agreed and constrained by reductions in budget. We recognise that (as GMEP before), the programme will collect selective but nonetheless important data on biodiversity that should demonstrate general trends in status and, through modelling, relate these trends to wider environmental and societal factors. As such, ERAMMP has the potential to provide valuable information on the long-term dynamics of some elements of biodiversity, ecosystem resilience, and the success of aspects of SMNR. Continuity is critical, and we strongly support the consistent re-survey of representative samples from GMEP.

58. Welsh Government should be careful not to use the same modelled data from ERAMMP both to target interventions and to monitor outcomes. Monitoring must remain separate from delivery to provide meaningful results.

59. ERAMMP, as currently proposed, will not provide the detailed evidence on the status of many habitats and species required to inform continuous scheme development and reporting for either the proposed scheme or SoNaRR. Additional samples in less common habitats that would otherwise be under-recorded by the current sampling strategy could reduce this issue.

60. Schemes that pay by outcome use the presence of appropriately managed habitat as a proxy for species presence. The species themselves cannot be used as an outcome as this would be unfair to the landowner; there is no guarantee on an individual farm basis that species will colonise or remain. The success of a scheme, however, must be monitoring to record the actual species population levels. ERAMMP currently contains too little species monitoring to report on the effectiveness of the proposed scheme for the recovery of species.

61. In terms of the wider reporting of ecosystem resilience, we would also note that Wales-wide indicators such as ecosystem extent and distribution, and derived measures such as connectivity, could be better obtained from remote sensing techniques than from sample field surveys. Remote sensing provides complete geographical coverage, resolving the issue of limited sample squares for some measures. Although it is unlikely that remote sensing will ever be sufficiently accurate to deliver reliable information for all measures. We would therefore urge collaboration between ERAMMP and initiatives such as the Living Wales Project, to develop integrated methods that could be employed by the proposed scheme.

62. Finally, additional qualitative monitoring and evaluation will be required to better understand the cultural and behavioural implications of moving to the new scheme. For example, understanding land manager's perspectives on the role and value of biodiversity in relation to their business will provide valuable insight to support and inform future cultural and behavioural change.

(18/01/19)

Y Pwyllgor Newid Hinsawdd, Amgylchedd a Materion Gwledig | Climate Change, Environment and Rural Affairs Committee

Ymchwiliad Bioamrywiaeth | Biodiversity Inquiry
Ymateb gan : Dŵr Cymru
Evidence from : Welsh Water

Thank you for the opportunity to submit evidence to the Committee's enquiry into biodiversity in context of a Public Goods scheme.

These comments are from Dŵr Cymru Welsh Water, the statutory water and sewerage undertaker that supplies over three million people in Wales and some adjoining parts of England. We are owned by Glas Cymru, a single purpose, not-for-shareholder Company. We provide essential public services to our customers by supplying their drinking water and then carrying away and dealing with their wastewater in a sustainable manner - a service which protects our environment and the biodiversity it supports. Our services are also essential to the sustainable economic development of Wales.

We have set out our responses in answer to the questions raised in the consultation and hope you find them useful. Please do not hesitate to contact us should you have any questions.

Director of Environment

How could the Welsh Government's proposed Public Goods scheme, set out in Brexit and Our Land, be applied to restore biodiversity?

1. We think there is great opportunity for a Public Goods scheme to deliver environmental benefits and thus play a part in reducing the current decline of biodiversity in Wales.
2. Dŵr Cymru relies on Wales' aquatic environment in relevant catchments. It is the source of our drinking water supplies and is the ultimate route for the return of our treated waste water. Our company – and, in turn, our customers who depend on the essential services we provide – therefore have a direct interest in its protection. The links between poor land management and poor water quality are well understood and well evidenced. Natural Resources Wales (NRW) monitoring shows that 59% of Wales' waterbodies are still not achieving good status under the EU's Water Framework Directive (WFD). NRW has identified agriculture and rural land management forestry sectors as contributing to 35% of these failures.
3. Against this background, we believe that the case for encouraging Welsh land managers to reduce their impact on the water environment is particularly compelling.
4. A high quality water environment is able to support a healthy variety of flora and fauna, so biodiversity would be a major beneficiary if, for example, levels of agricultural nutrients and pesticides were reduced, or their impacts mitigated. Thus, if improvements to the aquatic environment can be facilitated through a Public Goods Scheme so that more waterbodies achieve the 'Good Ecological Status' required by the Directive, there will be a clear and measurable restoration in biodiversity.
5. We believe that the key to restoration of biodiversity is to address the quality and connectivity of habitats upon which biodiversity depends. For this reason, our response to the Welsh Government's 'Brexit and our land' consultation suggested that the 'Resilient habitats and ecosystems' category should be universally available to all land managers. There is however a need to consider spatial targeting of Public Goods for some actions to protect and enhance biodiversity. Some public goods would only be worth funding if all (or at least most) land managers in a catchment were on board. Examples of

this would include efforts to eradicate invasive non-native species, or reducing nutrients and pesticide levels in water.

6. NRW's Area Statements (required by the Environment (Wales) Act 2016) which are currently in production may provide a useful signpost to the public goods that are of most relevance in particular locations. When considering mechanisms for delivery, there should be a move away from the 'one size fits all' approach of previous agri-environment schemes. To achieve biodiversity gain there needs to be a bespoke and coordinated approach from land managers, regulators and statutory bodies such as National Parks at a local and regional level. Central to this approach will be the need for trained advisors and project officers to deliver expert advice on scheme design and give feedback (before and) during scheme delivery. For a Public Goods scheme to be successful there should be a focus on achieving the best outcomes for both land managers and biodiversity, with funding targeted towards 'active' land managers who are capable of meeting the basic regulatory requirements of the scheme.

How could the various existing Welsh Government policies and legislation for biodiversity restoration be applied in the design and implementation of the proposed Public Goods scheme?

7. We think that the existing Welsh Government policies and legislation for biodiversity such as the Nature Recovery Plan for Wales and the biodiversity duty in the Environment (Wales) Act are generally fit for purpose. The biodiversity and resilience of ecosystems duty upon public authorities, many of whom may be land managers, to maintain and enhance biodiversity in the exercise of their functions is particularly relevant.
8. Dŵr Cymru published our statutory Biodiversity Plan, 'Making time for nature' in July 2017. Our Plan describes how our business interacts with nature. It highlights what we are already doing across the business to support nature and biodiversity and we will report upon progress by the end of 2019.
9. Clearly, any Public Goods scheme should follow the principles of sustainable management of natural resources set out in section 4 of the Environment (Wales) Act 2016

10. We do have some concerns on how other policies and legislation may impact upon the efficacy of a Public Goods scheme. Foremost amongst these concerns is the importance of 'additionality' within the proposals. We applaud the Welsh Government's proposal to introduce a criteria requiring that land managers meet basic regulatory requirements before they are eligible for any public funding. This essential requirement for a 'regulatory floor' should apply for any assistance under the Land Management Programme, not just the Public Goods strand.
11. Such funding schemes must not pay polluters not to pollute. They should reward land management practices which support the outcomes we are seeking such as 'Good Ecological Status' under the Water Framework Directive. A regulatory floor must be enforced if a scheme is to be credible, (which will need adequate resourcing) and must also support the development of market based ecosystem services. These could then supplement and enhance any payments under a 'public goods for public benefit' approach. We would urge Government to not just consider how the publicly funded elements of such a scheme could work, but how they could facilitate other sectors such as those interested in water, tourism and flooding to work with Government and supplement this whole process. We believe that a co-created scheme would also align with the five ways of working outlined in the Well-being of Future Generations (Wales) Act 2015.
12. Before the Programme is introduced, we would therefore like to see the introduction of the system of "basic measures" that the Welsh Government proposed in its 2017 consultation paper, "Taking Forward Wales' Sustainable Management of Natural Resources" and explored in chapter 7 of 'Brexit and our land'. Eligibility for support under the Land Management Programme should also require compliance with the relevant basic measures.
13. To make this approach more attractive, we suggest that there may be benefit in farmers who meet all the relevant requirements being eligible for a modest level of Public Goods support.
14. Care will also need to be taken to avoid unintended consequences. In particular, it is important to guard against incentivising activities under the economic resilience scheme that undermine investment in public goods. For example, improving productivity could result in intensification, posing

additional risks to water quality from increased use of pesticides and nutrient loading. There are similar risks from diversification. Explicitly applying additionality – complying with basic environmental requirements – to the Economic Resilience element, rather than just underpinning the Public Goods arm, would go some way toward mitigating these risks.

What lessons can be learned from the Glastir and Monitoring and Evaluation Programme (GMEP) to ensure effective monitoring and evaluation of schemes to support the restoration of biodiversity. How should the new Environment and Rural Affairs Monitoring and Modelling Programme (ERAMMP) be designed and implemented effectively for this purpose?

15. Although we have limited direct experience of Glastir we believe that monitoring will need to be an essential component of any Public Goods scheme.
16. Monitoring of the primary outputs for resilient habitats and ecosystems can be relatively simple. Quantifying the number of trees planted or area of grassland under management is straightforward, but calculating the biodiversity benefit arising is much harder; especially given the long timescales and inherent difficulty in measuring ecology.
17. This thought highlights the need for high quality information and advice in planning for biodiversity gain. The location, and connectivity of sites selected for biodiversity gain is critical to their likely success and the selection of such sites will require expert advice at an early stage. Establishing a baseline before any Public Goods are delivered is important in this regard – target options and priorities need to be correct and evaluation of any success requires a clear picture of the starting position.
18. Again, we hope that the Area Statements being prepared by Natural Resources Wales will be helpful in selecting appropriate sites; but we would also recommend the recent report by RSPB and the Sustainable Places Research Institute “Biodiversity and the area-based approach in Wales”[1] as a useful guide to spatial planning for biodiversity.

[1] http://orca.cf.ac.uk/113208/

Y Pwyllgor Newid Hinsawdd, Amgylchedd a Materion Gwledig | Climate Change, Environment and Rural Affairs Committee

Ymchwiliad Bioamrywiaeth | Biodiversity Inquiry
Ymateb gan : Parciau Cenedlaethol Cymru
Evidence from : National Parks Wales

1. Brecon Beacons, Pembrokeshire Coast and Snowdonia National Parks cover 20% of Wales. Wales' five Areas of Outstanding Natural Beauty cover a further 5%.

2. The three national park authorities, working in partnership as National Parks Wales (NPW), welcome the opportunity to contribute to the Climate Change, Environment and Rural Affairs Committee's inquiry on biodiversity restoration in the context of the proposed Public Goods Scheme.

3. The Committee's inquiry overview sets out the context of biodiversity decline. We note that the State of Natural Resources Report 2016 identifies that the root causes of biodiversity decline are embedded in social and economic systems, and suggests that partners should consider integrated place-based solutions that maximise contribution across Wales' well-being goals.

4. Welsh Government's post-Brexit support structure provides a unique opportunity to contribute to these solutions, by providing land managers with the right incentives and tools to restore a landscape rich in nature and to ensure that future generations experience a Wales richer in wildlife then it is today.

5. The majority of NPW's comments derive from the authorities' experiences in running conservation land management programmes complementary to national agri-environment schemes. As a general comment, NPW feels it is fundamental that Wales retains a strong land management sector which is able to undertake the work needed to provide both food and public goods and which can help tackle the challenges posed by climate change. Accordingly, NPW strongly supports the principle of a Public Goods scheme.

Q1: How could the Welsh Government's proposed Public Goods scheme, set out in Brexit and Our Land, be applied to restore biodiversity?

<u>Ambition</u>

6. Nature recovery in Wales will require a step change in the scale of ambition for land management change. If it is to halt and reverse the decline in biodiversity, the proposed Public Goods scheme must significantly widen participation in ecological restoration across Wales.

7. The phrase coined in the Lawton Review (Making Space for Nature, report to Defra 2010) applies: the Public Goods scheme must create "more, bigger, better, joined" habitat to buffer and increase the size of existing conservation sites and allow a landscape more permeable for wildlife to evolve.

8. NPW considers that biodiversity restoration must be considered hand in hand with:

- other public goods (including landscape, tranquility and dark night skies, air quality, soils, water resources and quality, and heritage and cultural values associated with biodiversity and the landscape)
- aspects of well-being (e.g. the resilience of rural communities and skills and workforce issues in delivering biodiversity) and
- wider environmental and economic risks (e.g. climate change, invasive species, pests and diseases, Brexit).

9. NPW perceives that there is a risk that differentials in funding and / or take-up between the proposed Public Goods and Economic Resilience schemes may result in the Public Goods scheme being unable to achieve the step change in biodiversity restoration that is necessary. The proposed Public Goods scheme must be resourced appropriately.

10. NPW understands the principle of an Economic Resilience scheme, however we feel it is important to learn from previous production incentive programmes and ensure that environmental, welfare and social factors are integrated into the scheme design. It will be critical to set the floor at the right level to deliver the widespread environmental improvements which are desired. This could be applied to the Economic Resilience scheme in order for it to be positive or neutral to the Public Goods scheme and in order to provide a springboard towards the Public Goods scheme.

Long term

11. The proposed Public Goods scheme will need to give land managers the assurance and confidence of long term support if biodiversity restoration is to form part of a viable long term business option. Thus the scheme should be long term - subject to adaptive review, and capable of responding to and anticipating environmental and economic change, but effectively unending.

Competitive with other land uses

12. The scheme must be available and attractive to all land managers in Wales. It is suggested that the scheme should include land in use for intensive food production, land managed explicitly for biodiversity, and everything in between. (Depending on Welsh Government's preferred options on how to allow access to tenants and common land graziers, a review of agricultural tenancy laws and common land laws may be required.)

13. Payments for biodiversity and other public goods must be competitive with alternative land uses and be able to reflect the comparative advantages of different farmland types and systems. As a general principle, more biodiversity should equate to more income. This suggests a shift from a profit-foregone to a goods-and-services provided formula – a results-based approach which is incentivised and competitive in the market place.
14. The Committee may wish to consider whether the proposed Public Goods scheme should reward historic and current conservation land management for outcomes already achieved, and if so how this might be done. (There might be potential for a differentiated 'basic payment' based on existing public goods values for example.)

15. The provision of a significant new income stream under the Public Goods scheme must be clearly understood and trusted by land managers as they prepare their businesses for change. Much of the communication of biodiversity as a public good may take place most effectively at a local level, alongside discussion of ideas for restoration of biodiversity and other public goods.

Collaborative and results-based

16. There is evidence to suggest that results-based schemes offer a number of benefits over traditional prescription-based schemes. We would like to draw the Committee's attention to the following schemes (although there are many examples from the UK, Europe and further afield):
    - The Burren Farming for Conservation Programme http://burrenprogramme.com/impact/outputs/
    - Dartmoor Farming Futures Project (an example on common land) https://ecosystemsknowledge.net/sites/default/files/wp-content/uploads/2014/6/Dartmoor-Farming-Futures-Independent-Project-Evaluation.pdf
    - Results-Based Agri-Environment Payment Scheme (RBAPS) pilot study in England https://www.gov.uk/government/publications/results-based-agri-environment-payment-scheme-rbaps-pilot-study-in-england

17. Results-based schemes can offer land managers greater freedom and flexibility to decide how to manage their land, opening doors to scheme managers to support land manager delivery through training, mentoring and collaboration, fostering greater levels of dialogue and understanding and ownership of scheme objectives.

18. The Burren Scheme (for example) has used a hybrid approach which combines a fixed rate payment alongside a results-based premium which can help to mitigate perceived uncertainty and risks for landowners taking part in output led schemes.

19. Results-based schemes can also foster collaboration with peers and in landscape-scale initiatives - so small high nature value farms and early adopters need not be disadvantaged if they are located in a low nature value setting.

20. Collaboration can offer better transparency and value for money. If higher levels of environmental outputs are achieved through collaboration, this can be rewarded through higher payments.

21. Results-based agreements combine to form meaningful scheme monitoring metrics in a way that compliance monitoring in prescription led schemes cannot. (We make further comment on this at question 3.)

22. The scheme (locally and as a whole) will likely need to reflect some indeterminate outcomes and might be expected or even designed to generate emergent, naturally dynamic landscapes. This has implications for determining overall scheme results, and individual agreements may need to reflect a desired direction and rate of

change - waypoints in adaptive management rather than some specific long-range destination.

Locally delivered

23. Defining public goods at the most local level possible will enable all concerned to understand how best to deliver them. In order to foster the long term relationships necessary to achieve the scale of outcomes required, we believe that there needs to be a substantial shift away from the current 'self-service' and 'contract manager' approach towards providing land managers with the opportunity to build sustainable long term relationships with locally-embedded, skilled advisors.

24. With adequate resourcing, these skilled advisors would also broker access to a wider enhanced support network (e.g. access to a pool of experts and guidance on priorities from Local Nature Partnerships). We believe this approach would help the scheme to develop a more nuanced local delivery interface, promoting innovative and creative thinking and collaboration, capitalising on ideas grown from the 'bottom up' and mitigating the pressure on the scheme to come up with all the answers.

25. NPW would welcome early discussion with Welsh Government regarding scheme delivery in National Parks. National Park authorities have considerable experience in working directly with the land management sector, running land management schemes (e.g. Tir Eryri, Pembrokeshire Grazing Network and Conserving the Park (Pembrokeshire Coast), Black Mountains Land Use Partnership), managing registered common land (e.g. Meithrin Mynydd) and working with commoners (graziers) associations. There may be scope for the authorities to help develop pilot and demonstration projects.

26. NPW believes that the designated landscapes of Wales are public goods in their own right as landscapes and as destinations that have a positive effect on local and regional economies. Designated landscape management plans are ideal vehicles to support regional and local approaches to scheme delivery, encouraging enterprise and regional distinctiveness, delivering food production, land management, nature recovery, rights of way improvement, heritage management, culture, health and visitor management for 25% of Wales, developing new models at appropriate scales in rich landscapes. Welsh Government's ambition for the designated landscapes of Wales as set out in "Valued and Resilient" identifies opportunities to develop such an approach in delivering public goods.

Q2: How could the various existing Welsh Government policies and legislation for biodiversity restoration be applied in the design and implementation of the proposed Public Goods scheme?

27. The proposed Public Goods scheme would be a major and logical initiative in pursuit of Wales' well-being goals and the sustainable management of natural resources. Regionally, the scheme could complement and help in delivery of (for example) area statements, local nature recovery plans, well-being plans and protected landscape management plans.

28. We envisage that the scheme would need to operate within a regulatory sphere that encloses a sustainable ‘solution space’. Scheme payments and other market forces would establish the equilibrium within that space.

29. Adequate enforcement of existing regulation (e.g., EIA (Agriculture) (Wales) Regulations 2017, Heather and Grass etc. Burning (Wales) Regulations 2008) is therefore essential to ensure that penalties act as deterrents and are not just an occasional cost of business.

30. It is suggested that it may be necessary to consider how a raised regulatory floor and / or better-resourced enforcement of it can provide a greater contribution to biodiversity delivery, so that the available finance under the proposed Public Goods scheme is required to work less hard.

31. One starting point could be to identify whether elevating existing voluntary Codes of Agricultural Good Practice to regulatory status may be appropriate. The codes cover areas where new regulation would have little or no impact on farm business and could result in cost savings (reducing overheads, enhancing soil quality, and reducing pollution risk for example), while delivering a significant and widespread benefit to biodiversity. Field boundary management is one such area.

32. Wildfire risks (including any additional risks that might be inherent in the scheme) need to be recognised and mitigated.

33. Many of Wales’ most valued and iconic landscapes are threatened by a lack of grazing, which is a key means of maintaining most remaining semi-natural habitats in Wales. Local grazing schemes are essential to re-establishing and maintaining sustainable grazing regimes. NPW advocates continued support for a pan-Wales grazing organisation to facilitate and assist with the creation of local grazing schemes throughout Wales.

Q3: What lessons can be learned from the Glastir Monitoring and Evaluation Programme (GMEP) to ensure effective monitoring and evaluation of schemes to support the restoration of biodiversity. How should the new Environment and Rural Affairs Monitoring and Modelling Programme (ERAMMP) be designed and implemented effectively for this purpose?

34. As suggested above, monitoring of results-based agreements can be combined to form a broad and meaningful scheme level monitoring metric which nests below, and tests assumptions of higher level monitoring. As an added advantage, the data can be disaggregated to a local level.

35. We also suggested that individual agreements and the scheme as a whole will need to accommodate, or indeed aim to create, emergent, functioning and naturally dynamic landscapes. The scheme’s effectiveness in terms of addressing factors affecting the state of nature in Wales can nevertheless be assessed, with analysis applied to separate the impact of other variables.

36. If attributes of some past environmental state (baseline) are to be employed as indicators of a future desired state, at whatever scale, then there must be a clear rationale for the selection of that baseline. A 1990s baseline implies different outcomes to a 1970s baseline for example. Setting a realistic but challenging (i.e. earlier) baseline might provide a way of recognising and rewarding historic achievements on high nature value holdings.

37. We suggested above that the scheme should allow latitude in setting regional and local results. At the most granular level (land managers and land management advisors/project officers), monitoring can help stimulate knowledge, participation and management innovation. There is potential for land managers and members of the community to contribute to monitoring. Incidentally, this could help create a successional resource for local officers.

38. Monitoring will also need to be in place for basic measures and for the regulatory floor. Given the emphasis on public goods, there needs to be more than self-certification; a watchdog role to protect public interests and the taxpayers' investment, for example.

Thank you for the opportunity to input to this inquiry.

Y Pwyllgor Newid Hinsawdd, Amgylchedd a Materion Gwledig | Climate Change, Environment and Rural Affairs Committee
Ymchwiliad Bioamrywiaeth | Biodiversity Inquiry
Ymateb gan : Cymdeithas Ecolegol Prydain
Evidence from : British Ecological Society

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www.britishecologicalsociety.org

Founded in 1913, we are the world's oldest ecological society, with over 6,000 members worldwide. As the voice of the UK's ecological community, we communicate the value of ecological knowledge to policymakers and promote evidence-informed solutions.

1. How could the Welsh Government's proposed Public Goods scheme, set out in Brexit and Our Land, be applied to restore biodiversity?

1.1 It is important to protect rare species and to preserve ecosystem function

Biodiversity is a broad term and includes multiple variables at different scales including: genetic, individual species, population and ecosystem variables[1]. Ecosystem functions are a product of the communities of species and habitats that reside within the system, with greater biodiversity improving ecosystem productivity and resilience[2]. A functioning ecosystem will in turn provide services to humans, including pollination, soil formation and ecotourism, all of which have tangible value[3]. The proposed Public Goods Scheme (PGS) suggests that, through appropriate management, Welsh land can significantly contribute to various ecosystem services. However, the delivery of such services will ultimately depend on farmers and land managers being incentivised to promote biodiversity conservation, thus supporting the maintenance and resilience of ecosystem services[4,5]. Hence, we welcome the public goods approach.

Although not all encompassing[6], species abundance and distribution are intuitive metrics of biodiversity change, both readily available and commonly used[7]. As environmental disturbance increases, rare species tend towards extinction, while globally common species multiply and

[1] See the candidate Essential Biodiversity Variables, from Group on Earth Observations. Available at: https://geobon.org/ebvs/what-are-ebvs/
[2] Seddon et al. (2016). Biodiversity in the Anthropocene: prospects and policy. *Proceedings of the Royal Society B: Biological Sciences*, 283.
[3] Seddon et al. (2016). Biodiversity in the Anthropocene: prospects and policy. *Proceedings of the Royal Society B: Biological Sciences*, 283.
[4] Shwartz et al. (2017). Scaling up from protected areas in England: The value of establishing large conservation areas. *Biological Conservation*, 212.
[5] Seddon et al. (2016). Biodiversity in the Anthropocene: prospects and policy. *Proceedings of the Royal Society B: Biological Sciences*, 283.
[6] Feld et al. (2009). Indicators of biodiversity and ecosystem services: a synthesis across ecosystems and spatial scales. *Oikos*, 118.
[7] E.g. used in the RSPB State of Nature report and Living Planet Index

spread: a process known as biotic homogenisation[8]. Although common species may be able to deliver similar ecosystem services under **current environmental conditions**[9], the loss of rarer species may threaten the resilience[10] of ecosystem function and service provision under predicted **future environmental conditions**[11,12]. Some rare species can play critical functional roles and are 'keystone' species in their ecosystems[13], for example the sea otter, whose predation limits the expansion of urchin beds and maintains kelp forests[14].

Within the UK, the impact of species loss on ecosystem function has not yet been fully realised, potentially because functionally important species have not yet been lost or their functional role has been replaced by an alternative species (an 'insurance' effect of increased biodiversity)[15]. However, under increasing environmental disturbance it is likely that a tipping point will be reached where ecosystems will begin to fail[16]. This may disproportionately affect some ecosystem services, with pollination and pest control most prone to loss in service provision[17]. Loss of such services would be of genuine economic concern to Welsh agriculture, with pollinators in the UK valued at £430 million per year[18].

Alongside its instrumental value, biodiversity also has intrinsic value. This must remain an important driver for conservation effort[19]; an ecosystem services approach should be complimentary, not conflicting. Biodiversity should be maintained for non-anthropocentric reasons, as species are "the product of a long history of continuing evolution by means of ecological processes, and so they have the right to a continued existence"[20]. In line with this moral argument, the extinction of rare species and habitats should be prevented, irrespective of their functional contribution to the ecosystem. Whilst an ecosystem services approach may also be mutually beneficial to biodiversity conservation (a win-win), it is important to identify situations for which this is not the case[21]. Decision-makers must be realistic and identify the gap species, habitats and ecological processes, for which different approaches may be required for their future persistence[22].

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[8] McKinney & Lockwood. (1999). Biotic homogenization: a few winners replacing many losers in the next mass extinction. *Trends in Ecology and Evolution*, 14.
[9] Winfree et al. (2015). Abundance of common species, not species richness, drives delivery of a real-world ecosystem service. *Ecology Letters*, 18.
[10] "Ecosystem resilience is the inherent ability to absorb various disturbances and reorganize while undergoing state changes to maintain critical functions." Sasaki et al. (2015). Perspectives for ecosystem management based on ecosystem resilience and ecological thresholds against multiple and stochastic disturbances. *Ecolgoical Indicators*, 57.
[11] Leitao et al. (2016). Rare species contribute disproportionately to the functional structure of species assemblages. *Proceedings of the Royal Society B*, 283.
[12] Oliver et al. (2015). Biodiversity and resilience of ecosystem functions. *Trends in Ecology and Evolution*, 30.
[13] Power et al. (1996). Challenges in the Quest for Keystones. *BioScience*, 46.
[14] Estes & Palmisano. (1974). Sea Otters: Their Role in Structuring Nearshore Communities. *Science*, 20.
[15] Oliver et al. (2015). Declining resilience of ecosystem functions under biodiversity loss. *Nature Communications*, 6.
[16] Oliver et al. (2015). Declining resilience of ecosystem functions under biodiversity loss. *Nature Communications*, 6.
[17] Oliver et al. (2015). Declining resilience of ecosystem functions under biodiversity loss. Nature Communications, 6.
[18] Smith et al. (2011). Regulating Services, in The U.K National Ecosystem Assessment Technical Report.
[19] Ghilarov. (2000). Ecosystem Functioning and Intrinsic Value of Biodiversity. *Oikos*, 90.
[20] Alho. (2008). The value of biodiversity. *Brazilian Journal of Biology*, 68.
[21] Naidoo et al. (2008). Global mapping of ecosystem services and conservation priorities. *PNAS*, 105.
[22] Ingram et al. (2012). Applying Ecosystem Services Approaches for Biodiversity Conservation: Benefits and Challenges. *Sapiens*, 5.

Biodiversity conservation should be at the heart of the new PGS, not a by-product; increased biodiversity will improve delivery and resilience of ecosystem services, as well as respect the intrinsic value of species. By conserving biodiversity, Wales will be able to meet both international and national commitments. Internationally, Aichi target 12 from the Convention on Biological Diversity, to which the UK is a signatory, requires the prevention of further extinctions by 2020[23]. In Wales, the Environment Act 2016 Section 7 states the government must "take all reasonable steps to maintain and enhance" populations of priority species and habitat[24]. In addition, the Well-being of Future Generations (Wales) Act 2015, goal 2, describes a resilient Wales as; "A nation which maintains and enhances a biodiverse natural environment with healthy functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change (for example climate change)"[25]. Therefore, Wales has an obligation to protect and restore the wildlife it holds.

1.2 Agricultural intensification has contributed to the current depleted state of biodiversity in Wales

Although some Welsh species, including red kites and otters, have recently improved in population status[26], the overall trend for Welsh wildlife is one of ongoing net decline[27]. Indeed, Wales was found to be in the lowest fifth of 218 countries analysed in the Biodiversity Intactness Index (BII)[28]. Biodiversity decline has been driven by pressures that are primarily linked to agricultural activities, including the loss, degradation and fragmentation of habitats; over-exploitation and unsustainable use of natural resources; and excessive nutrient input and greenhouse gas emissions[29,30]. Globally, this has led to significant changes in ecosystem function[31,32], threatening ecosystem services essential for agriculture, including pollination[33], natural pest control[34], and groundwater recharge[35].

We are pleased to see the acknowledgement of the environmental problems associated with the Common Agriculture Policy (CAP). Research has strongly linked Pillar 1 payments to increased agricultural intensification and associated environmental degradation[36]. Pillar 2 payments, which include income for conservation measures, have only shown limited success in reversing

[23] Aichi Biodiversity Targets from the Convention on Biological Diversity Strategic Plan 2011-2020.
[24] Environment (Wales) Act 2016 Section 7.
[25] Well-being of Future Generations (Wales) Act 2015: Part 2- Improving well-being
[26] RSPB. (2016). State of Nature: Wales Report.
[27] RSPB. (2016). State of Nature: Wales Report.
[28] RSPB. (2016). State of Nature: Wales Report.
[29] RSPB. (2016). State of Nature: Wales Report.
[30] Burns et al. (2016). Agricultural Management and Climatic Change Are the Major Drivers of Biodiversity Change in the UK. *PLoS ONE*, 11.
[31] Flynn et al. (2009). Loss of functional diversity under land use intensification across multiple taxa. *Ecology Letters*, 12.
[32] Gamez-Virues et al. (2015). Landscape simplification filters species traits and drives biotic homogenization. *Nature Communications, 6.*
[33] Potts et al. (2010). Global pollinator declines: Trends, impacts and drivers. *Trends in Ecology & Evolution*, 25.
[34] Bianchi et al. (2006). Sustainable pest regulation in agricultural landscapes: A review on landscape composition, biodiversity and natural pest control. *Proceedings of the Royal Society B: Biological Sciences*, 273.
[35] Wada et al. (2010). Global depletion of groundwater resources. *Geophysical Research Letters*, 37.
[36] Pe'er et al. (2014). EU agricultural reform fails on biodiversity. *Science*, 344.

environmental degradation and biodiversity loss[37,38]. Thus, restoring biodiversity will require both a reduction in the negative externalities of agricultural intensification, such as pollution and grazing, and an increase in conservation measures, such as habitat creation and restoration.

1.3 Intensive agricultural can have high environmental costs

Our original response to the "Brexit Our Land"[39] consultation addressed many of the threats to biodiversity and ecosystem services associated with intensive agriculture, as well as opportunities for change. This was predominantly addressed in the answer to question 10 and included:

- Reduced soil quality (previous response, section 10.1)
- Reduced water quality (10.2)
- Loss of natural flood defences (10.3)
- Reduced air quality (10.4)

1.4 Conservation measures

Alongside reductions in environmentally damaging practices, there are various types of conservation actions a land manager could undertake to further increase biodiversity, including management of the general landscape, and species-specific interventions within a landscape[40].

1.4.1 Target-focused land management (e.g. creation and restoration of priority habitats)

In the absence of unlimited funds, priority setting is an essential element of conservation planning[41,42]. Decision-makers may need to choose conservation targets of specific populations, species and/or habitats, depending on their conservation status and/or importance to ecosystem service delivery[43,44].

In Wales, the agri-environment scheme (AES) options resulting in the greatest biodiversity gain is associated with arable management (e.g. winter stubbles), serving a select number of species also associated with arable land[45]. Their success is likely because these schemes result in a dramatic change from an unfavourable habitat to a completely different but more favourable habitat. However, only 13% of Welsh agricultural land is arable, and most species rely on grassland or

[37] Shwartz et al. (2017). Scaling up from protected areas in England: The value of establishing large conservation areas. *Biological Conservation*, 212.
[38] Pe'er et al. (2014). EU agricultural reform fails on biodiversity. *Science*, 344.
[39] British Ecological Society: Policy: Consultation and Inquiry Responses. https://www.britishecologicalsociety.org/policy/reports-publications/consultation-inquiry-responses/
[40] IUCN – CMP Conservation Actions Classification v 2.0
[41] Margules & Pressey. (2000). Systematic conservation planning. *Nature*, 405.
[42] Wilson et al. (2011). Optimal restoration: accounting for space, time and uncertainty. *Journal of Applied Ecology*, 48.
[43] Noss et al. (2009). Prioritizing ecosystems, species, and sites for restoration.
[44] Evans et al. (2013). The robustness of a network of ecological networks to habitat loss. *Ecology Letters*, 16.
[45] MacDonald et al. (In Press). Have Welsh agri-environment schemes delivered for focal species? Results from a comprehensive monitoring programme. *Journal of Applied Ecology*.

other semi-natural habitats[46]. In Wales, AES management of these semi-natural habitats does not deliver higher species abundance, despite doing so elsewhere in the UK[47]. Potential reasons for this failure include:

- Low uptake – Tir Gofal only covers 22% of agricultural land, with a much smaller percentage of this being semi-natural habitat[48].
- Poor understanding of species biology – AES management options for specific species has often not gone beyond general habitat management and has lacked the necessary specificity to benefit monitored species[49].
- Poor starting habitat quality of many sites means that demonstrable biodiversity gains are only possible over longer periods[50].

As the current AES options in Wales are not delivering significant biodiversity increases, it is likely ecosystem functioning and ecosystem service delivery is reduced[51].

To combat biodiversity decline and improve ecosystem function, in the face of environmental and manmade perturbations, the Lawton principles of Bigger, Better, More, and Joined (BBMJ), are applicable to Wales, and public goods payments should finance the creation of an improved network of habitats[52,53]. In practice, this would mean semi-natural habitats within agricultural landscapes should be larger in size and more effectively managed. Furthermore, there should be more of each semi-natural habitat within a landscape, and the patches should be better connected with high-quality habitat corridors and lower intensity agricultural landscape surrounding them.

When determining the long-term resilience of an ecological network, it is important to understand the resilience of the various species within, both in terms of their persistence and their continued role in ecosystem functioning. Understanding of complex species interactions networks has grown considerably[54,55]. Through technology, such as 'barcoding' and genetic algorithms, we can understand the functional role species play within their ecosystem and thus the impacts of their

[46] MacDonald et al. (In Press). Have Welsh agri-environment schemes delivered for focal species? Results from a comprehensive monitoring programme. *Journal of Applied Ecology*.
[47] MacDonald et al. (In Press). Have Welsh agri-environment schemes delivered for focal species? Results from a comprehensive monitoring programme. *Journal of Applied Ecology*.
[48] MacDonald et al. (In Press). Have Welsh agri-environment schemes delivered for focal species? Results from a comprehensive monitoring programme. *Journal of Applied Ecology*.
[49] MacDonald et al. (In Press). Have Welsh agri-environment schemes delivered for focal species? Results from a comprehensive monitoring programme. *Journal of Applied Ecology*.
[50] MacDonald et al. (In Press). Have Welsh agri-environment schemes delivered for focal species? Results from a comprehensive monitoring programme. *Journal of Applied Ecology*.
[51] Seddon et al. (2016). Biodiversity in the Anthropocene: prospects and policy. *Proceedings of the Royal Society B: Biological Sciences*, 283.
[52] Isaac et al. (2018). Defining and delivering resilient ecological networks: Nature conservation in England. *Journal of Applied Ecology*, 55.
[53] Lawton. (2010). Making space for nature: A review of England's Wildlife Sites and Ecological Network.
[54] Evans et al. (2013). The robustness of a network of ecological networks to habitat loss. *Ecology Letters*, 16.
[55] For reviews, see: Fontaine et al. (2011). The ecological and evolutionary implications of merging different types of networks. *Ecology Letters*, 14; and Kefi et al. (2012). More than a meal… integrating non-feeding interactions into food webs. *Ecology Letters*, 15.

potential extinction[56]. This can be done for multiple species at once, looking at changes over large temporal and spatial scales[57]. This technology can be combined with high resolution remote sensing of real landscapes to quantify actual network resilience. Given the costs associated with creating and managing ecological networks, decision-makers should harness these powerful tools in order to predict and optimise the outcomes of public good investments in biodiversity[58].

When deciding on-the-ground actions to improve the network (BBMJ), simpler proxies would need to be used to confer network resilience, for example changes in: area of high-quality habitat; median patch size; total area of suitable habitat for multiple species; and network conductance[59]. In order to continually improve upon decision-making, decisions should form part of an adaptive management cycle, linking science, planning, and implementation. When evaluating action effectiveness initially, interventions should be measured against non-intervention 'control' sites, for instance, to see whether intervention sites are experiencing lower extinction rates and/or higher colonization rates than control sites[60]. The most effective actions identified are then implemented, continually monitoring their success locally and across the network, over longer time scales[61].

Whilst this practice will improve biodiversity in general, decisions will still need to be made for which population/species/habitat to target for protection and restoration. This can be done with an ecosystem service outcome in mind (e.g. expanding a peatland that sequesters carbon or increasing the population of an important pollinator), and/or purely to improve the recovery of rare species/habitats. Again, it is important to reiterate that prioritising one option over another may result in trade-offs – e.g. increasing connectivity for one target pollinator species may lead to the spread of an invasive species that harms a different target rare species[62]. Assessing the benefits (and those that are foregone because of trade-offs) will enable payments to be linked directly to actions and will make the economic case to both the farmers and public[63].

1.4.2 Process-focused land management

As much of our current biodiversity depends on the preservation and restoration of semi-natural habitats[64], it is important they are created and maintained as core areas of biodiversity in a

[56] Evans et al. (2013). The robustness of a network of ecological networks to habitat loss. *Ecology Letters*, 16.
[57] Isaac et al. (2018). Defining and delivering resilient ecological networks: Nature conservation in England. *Journal of Applied Ecology*, 55.
[58] Isaac et al. (2018). Defining and delivering resilient ecological networks: Nature conservation in England. *Journal of Applied Ecology*, 55.
[59] Isaac et al. (2018). Defining and delivering resilient ecological networks: Nature conservation in England. *Journal of Applied Ecology*, 55.
[60] Isaac et al. (2018). Defining and delivering resilient ecological networks: Nature conservation in England. *Journal of Applied Ecology*, 55.
[61] Isaac et al. (2018). Defining and delivering resilient ecological networks: Nature conservation in England. *Journal of Applied Ecology*, 55.
[62] Isaac et al. (2018). Defining and delivering resilient ecological networks: Nature conservation in England. *Journal of Applied Ecology*, 55.
[63] Strassburg et al. (2018). Strategic approaches to restoring ecosystems can triple conservation gains and halve costs. *Nature Ecology and Evolution*, 3.
[64] Duelli and Obrist. (2003). Regional biodiversity in an agricultural landscape: the contribution of semi-natural habitat islands. *Basic and Applied Ecology*, 4.

patchwork landscape of diverse habitats. However, in other areas, different options may be more appropriate for increasing biodiversity and delivering ecosystem services. Rewilding could represent a cost-effective solution to enhance biodiversity and ecological resilience in degraded agricultural landscapes, due to rewilding's goal of "self-sustaining provision of ecosystem services with minimal ongoing management"[65].

Rewilding is an option for the management of certain agricultural landscapes and could represent a transformative approach to conserving biodiversity in Wales. Environmental change is increasingly undermining the function of ecosystems under a target-focused approach[66]. Given the recent declines in biodiversity, continuing restoration to historical benchmarks or modern likely equivalents may no longer be an option. Thus, to ensure ecosystems can maintain biodiversity and function, allowing delivery of ecosystem services over the long term, rewilding may be the most appropriate option for damaged ecosystems[67]. As with the restoration of semi-natural habitats, following the BBMJ principles will be important for rewilding areas too.

1.4.3 Delivering conservation at scale

Delivering biodiversity public goods will require partnerships between landowners, where such collaboration is needed to deliver schemes at the appropriate spatial scale to restore or enhance ecosystem services[68,69,70]. Indeed, research[71] into spatial coordination of environmental management from five EU member states found that groups of farmers who formed an organisation were more effective in delivering agri-environment objectives[72]. A farm-level only focus to PGS would, therefore, be a missed opportunity for delivering public goods.

This approach should be guided by a spatial vision that strategically improves landscape heterogeneity. For instance, a mix of perennial habitats such as forests, hedgerows, river corridors and perennial grasslands will create more complex and hence more biodiverse landscapes[73]. Landscapes with greater structural complexity will also improve ecosystem functions for farms by increasing pest suppression and supporting pollinators[35].

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[65] Pettorelli et al. (2018). Making rewilding fit for policy. *Journal of Applied Ecology*, 55.
[66] Pettorelli et al. (2018). Making rewilding fit for policy. *Journal of Applied Ecology*, 55.
[67] Pettorelli et al. (2018). Making rewilding fit for policy. *Journal of Applied Ecology*, 55.
[68] Anthony et al. (2012) Contribution of the Welsh Agri-Environment Schemes to the Maintenance and Improvement of Soil and Water Quality, and to the Mitigation of Climate Change. Agri-Environment Monitoring and Technical Services Contract Lot 3: Soil, Water and Climate Change (Ecosystems). Welsh Government, Cardiff, UK.
[69] Westerink et al (2017). Collaborative governance arrangements to deliver spatially coordinated agri-environmental management. Land Use Policy, 69: 176-192.
[70] Kark et al (2015). Cross-boundary collaboration: key to the conservation puzzle. *Current Opinion in Environmental Sustainability*, 12: pp.12-24.
[71] Westerink et al (2017). Collaborative governance arrangements to deliver spatially coordinated agri-environmental management. Land Use Policy, 69: pp.176-192.
[72] South Downs National Park Authority. (2018). Selborne farm cluster. [Online]. Available at: https://www.southdowns.gov.uk/national-park-authority/our-work/farm-clusters/selborne-farm-cluster/
[73] Concepcion et al (2008). Effects of landscape complexity on the ecological effectiveness of agri-environment schemes. *Landscape Ecology*, 23: pp.135–148.

The effectiveness of previous and current agri-environment schemes is highly variable, and often depends on the level of engagement, experience and skills of the farmer[74]. Studies from across the UK have shown biodiversity outcomes improving when farmers and landowners received training[75,76]. Supporting and encouraging peer-to-peer support among farmers also significantly improves environmental outcomes, with farmers feeling more confident and being more likely to engage in environmental management in their wider area[77,78,79,80].

1.4.4 Specific species management

In general, effective habitat management should sustain larger populations of species. However, for certain species, it may be appropriate to perform additional management actions to reach this outcome. Delivery of ecosystem services and biodiversity conservation outcomes may be improved through more active conservation measures, including artificial nesting sites, translocation of species vulnerable to climate change, or even reintroductions. Such actions can serve multiple purposes:

The presence of popular, charismatic species can have huge economic benefits; for example, 290,000 people visit osprey sites in the UK every year, bringing in an estimated £3.5 million to surrounding areas[81]. Other charismatic species, such as beavers, can provide additional benefits. Beavers act as "ecosystem engineers", improving habitat quality and increasing an area's biodiversity value, therefore enhancing public goods in that area[82].

[74] McCracken et al (2015) Social and ecological drivers of success in agri-environment schemes: the roles of farmers and environmental context. *Journal of Applied Ecology,* 52: pp. 696-705.

[75] Guillem and Barnes (2013). Farmer perceptions of bird conservation and farming management at a catchment level. *Land Use Policy,* 31: pp.565– 575.

[76] Dicks et al (2017) Farmland Conservation Pages 245-284 in: W.J. Sutherland, L.V. Dicks, N. Ockendon & R.K. Smith (eds) What Works in Conservation 2017. Open Book Publishers, Cambridge, UK.

[77] Welsh Government. (2018). New service to support farmers and foresters to apply for the RC-RDP Sustainable Management Scheme. [Online]. Available here:
https://gov.wales/topics/environmentcountryside/farmingandcountryside/cap/wales-ruralnetwork/news/59591494/?lang=en

[78] Rose Regeneration. Putting the Spotlight on Farming Communities: The role of Farmer Networks in challenging areas. Farmers Network Project report 2013. Commissioned by the Royal Agricultural Society of England (RASE).

[79] Lastra-Bravo et al (2015). What drives farmers' participation in EU agri-environmental schemes? Results from a qualitative meta-analysis. *Environment Science & Policy*, 54: pp. 1–9.

[80] Hejnowicz et al (2016). A survey exploring private farm advisor perspectives of agri-environment schemes: The case of England's Environmental Stewardship programme. *Land Use Policy*, 55: 240-256.

[81] RSPB. (2006). Watched Like Never Before… the local economic benefits of spectacular bird species. Available at:
https://www.rspb.org.uk/globalassets/downloads/documents/positions/economics/watchedlikeneverbefore_tcm9- 133081.pdf

[82] Law et al. (2017). Using ecosystem engineers as tools in habitat restoration and rewilding: beaver and wetlands. *Science of The Total Environment*, 605-606.

3 What lessons can be learned from the Glastir Monitoring and Evaluation Programme (GMEP) to ensure effective monitoring and evaluation of schemes to support the restoration of biodiversity. How should the new Environment and Rural Affairs Monitoring and Modelling Programme (ERAMMP) be designed and implemented effectively for this purpose?

The UK's impending withdrawal from the European Union is likely to lead to major changes to the way that agricultural subsidies will be paid in Wales, with the most likely change being a greater emphasis on paying public money for public goods, including ecosystem services as well as biodiversity. The new Environment and Rural Affairs Monitoring and Modelling Programme (ERAMMP), is currently being implemented as a successor to the Glastir Monitoring and Evaluation Programme (GMEP). Earlier Welsh AES were the subject of monitoring programmes between 2009 and 2012, with separate components focusing on ecosystem services, habitats and species. The results of species monitoring have recently been accepted as a peer-reviewed article in the Journal of Applied Ecology[83].

The species monitoring programme included dedicated field work to survey a range of taxa: arable plants, grassland fungi, bats (six species), butterflies (three species), birds (five species), and terrestrial mammals (two species), with AES sites selected on the basis of the presence of prescriptions predicted to be beneficial to the taxa in question. Spatial analysis was required, as the monitoring programme did not include re-surveys. The results indicated limited benefits of AES management, although taxa dependent on arable habitats were more likely to be more abundant or species-rich in farms or fields under AES agreements than non-AES farms or fields.

The approach taken by Glastir Monitoring and Evaluation Programme (GMEP) towards species monitoring differed from this earlier monitoring in two key respects: Firstly, it employed a re-surveying strategy, allowing for changes over time to be detected, and enabling the effects of AES management to be more confidently attributed. We welcome this approach. Secondly, it did not target dedicated field work to species of conservation concern; rather, it developed indices of taxonomic groups, and reported habitat quality. This latter approach may be understandable when carrying out a national monitoring programme, as scarce species are more difficult to detect when sampling sites are randomly located.

Nevertheless, we recommend that ERAMMP does take account of scarce species. The ecological needs of some species are imperfectly known, and effects other than habitat quality (for example, predation pressure) may mean that measures of habitat quality may not accurately reflect the impact of AES on the species they are intended to benefit. Planning and carrying out a species-focused monitoring programme in Wales has been possible in the past, and should form part of ERAMMP. This would be additional to the existing survey methods used by GMEP: considering the

[83] MacDonald et al. (In Press). Have Welsh agri-environment schemes delivered for focal species? Results from a comprehensive monitoring programme. *Journal of Applied Ecology*.

amounts paid in agricultural subsidies, a small fraction of these resources for effective monitoring should be considered an investment rather than a cost.

Additionally, we recommend that the design of the new AES should include more specific aims for species, as well as other elements. This would allow monitoring to evaluate AES against targets, rather than non-specific aspirations. To some extent, the use of the term “biodiversity” is unhelpful in determining goals. Does biodiversity refer to general species richness (and if so, of which taxa), abundance of priority species (and if so, which ones), or the presence and quality of habitats? Explicitly including targets for species of interest would avoid this ambiguity. These aims need not be unrealistic, but they would assist in providing an honest appraisal of what we hope to provide through public funds.

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Llywodraeth Cymru
Welsh Government

Our ref: MA/P/LG/0472/19

Mike Hedges AM
Chair
Climate Change, Environment, and Rural Affairs Committee
National Assembly for Wales

7 February 2019

Dear Mike,

Many thanks for your letter of 10 January seeking my views on the UK Government's draft Environment Bill and a request for an update on the Welsh Government's proposals for environmental governance following the UK's exit from the EU. Please accept my apologies for not responding sooner, our work on ensuring we have a functioning statute book on exit day is at a critical stage and resulted in this delay.

I have continually sought to engage with the UK Government on possible collaborative approaches to addressing the environmental governance gaps arising from the UK exiting the EU. In doing so, I have underlined the different position in Wales, where our existing legislation means there is a difference in the environmental governance gap we will have in comparison with the other UK nations. Any UK-wide proposals to address environmental governance gaps must, therefore, not only respect the devolution settlement, but also be compatible with our existing Welsh legislative framework.

As the environment is a devolved matter on which the Assembly has already passed ground-breaking legislation, we start from very a different position to the one the UK Government faces with respect to its responsibilities for England. This difference can be illustrated through a comparison between the current EU architecture and the legislative framework already in place in Wales.

The EU Treaties represent a two tier approach. This consists of an overarching context to promote sustainable development, which applies across all policy areas, within which the four EU environmental principles sit. In Wales, the overarching sustainable development context is enshrined through the Well-being of Future Generations (WFG) Act. The Environment Act, which integrates the management our natural resources into the WFG Act's sustainable development architecture, introduced a further set of principles, which apply to the management Wales' natural resources. In this way, a two-tier architecture exists in both Wales and the EU. This legislative architecture does not however exist at a UK-wide level or in other parts of the UK. Furthermore, our approach in Wales has is not just aligned more closely with the EU's architecture, but is also to the international level, in particular, the UN sustainable development goals, Framework Convention on Climate Change and the UN Convention on Biological Diversity's ecosystem approach.

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The scope of our existing framework is, therefore, wider and more integrated than the model proposed in the UK Bill, particularly as sustainable development applies across all policy areas without exception. It is also supported by specific statutory duties on Welsh Ministers and Welsh public bodies and puts in place provision at both a national and local level.

No clarity has been provided by the UK Government on what it believes will or will not constitute a reserved matter in terms of the environment. As it stands, the Bill does not reflect the current devolution settlement. Rather than being drafted in line with the existing devolution settlements, where everything is devolved save for those matters specifically reserved, the Bill seeks to carve out devolved competence. In addition, the Bill places a focus on the role of Ministers of the Crown, who of course operate in Wales. Given a substantial area of land in Wales is for example managed by the Ministry of Defence, as drafted, Ministers of the Crown, whilst operating in Wales, will be required to carry out functions in line with the requirements under the Bill. This would ,for example, encompass the policy statement as defined by the Secretary of State. This can create a conflict where existing legislation passed by the Assembly has already placed a duty on these Ministers. The Environment Act having placed a duty on Ministers of the Crown in relation to the management of Wales' environment (section 6), thereby ensuring alignment in Wales with the wider legislative framework. There are also potential issues with for example how the courts may use the principles as interpretative tools in deciding cases on environment law.

A number of Welsh bodies also operate functions within reserved areas and therefore as the Bill is currently drafted could be subject to scrutiny by the new OEP even though as constituted, it is focused on the governance gap in England. Any environmental oversight body operating in Wales would however need to work with, rather than cut across, the primary legislation in place in Wales. This is particularly the case in relation to the Well-being of Future Generations, Environment and Planning Acts. It would also need to complement and align with existing bodies and their roles in Wales, which are also different to other parts of the UK, in particular Natural Resources Wales, the Future Generations Commissioner and the role of the Auditor General for Wales.

In summary, given our starting point is very different, the model the UK Government have developed within the Bill for England is not a workable approach for Wales. As it currently stands, it is also not compatible with the devolution settlement or our existing legislation.

I remain ready to work collaboratively on potential UK-wide approaches to this important issue and we continue to proactively engage with the UK Government.
In parallel we are working to finalise our consultation for publication this month. With the prospect of a catastrophic no deal outcome looming, our foremost priority is however to ensure there is a workable statute book in place to provide stability and maintain our environmental standards.

Post exit day, our existing principles (5-ways of working and the principles of sustainable management of natural resources) will continue to apply. Further, our exiting accountability bodies, such as the Public Services Ombudsman, will continue to receive citizens' complaints and our Future Generations Commissioner will continue to act as the guardian of sustainable development.

Regards,

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7 February 2019

Dear Mike

I would like to thank you and the Climate Change, Environment and Rural Affairs Committee again for your work and the detailed report published on 16 October 2018 entitled 'The impact of Brexit on fisheries in Wales'. In addition to my letter in response to the committee on 27 November 2018 I agreed to update you further on 4 topics discussed in your report.

Recommendation 2: The Welsh Government should report back to the Committee within the next 12 weeks on discussions it has had with the UK Government about future fisheries policy. This should include discussions about the proposed common framework for fisheries management and any proposals for an inter-governmental mechanism to facilitate agreement between the UK Administrations on common frameworks, including fisheries policy.

The Welsh Government officials have been working closely with UK and devolved counterparts on future fisheries policy. The UK Fisheries Bill makes provision for a jointly agreed policy statement to underpin the legislative and non legislative elements of the framework. The Bill is still being discussed in UK Parliament and I will be pleased to update the committee at the conclusion of these discussions.

Recommendation 3: The Welsh Government must ensure that it engages on an ongoing basis with representatives from across the entire fisheries sector. It should report back to this Committee within the next 12 weeks on actions it will take to broaden engagement.

The Welsh Government has established and worked closely with a number of fisheries and marine stakeholder groups which meet regularly. These groups represent a broad cross-section of the views of all stakeholders.

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Recommendation 4: The Welsh Government should report back to this Committee within the next 12 weeks on whether it believes its capacity on fisheries policy, both in terms of staffing numbers and expertise, is sufficient in the short term. The Welsh Government should also report back to this Committee on any plans it has to increase capacity in those areas.

We still maintain that we have sufficient capacity in relation to fisheries policy and we are seeking to increase capacity to deal with short term work to prepare for exit from the European Union. This remains an adaptive plan responding proactively to the developing EU Exit situation, and as the Committee has expressed an interest, we will undertake to write should the situation change.

Recommendation 5: The Welsh Government should report back to this Committee within 12 weeks on its plans to increase domestic demand for Welsh fish and shellfish.

The Welsh Government recognises the value of seafood as a sustainable protein source for future generations. We are committed to engaging with key stakeholders to seek to increase domestic consumption and have funded a seafood marketing project, in the region of £1m through the European Maritime Fisheries Fund. We have developed and contributed to recipes in Seafish consumer campaigns, we will continue to promote Welsh products at trade events and the Welsh Government funded Seafood Cluster has also been in dialogue with UK based retailers.

I welcome your continued interest in this area.

Regards
Lesley

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13 February 2019

Dear Mike,

Thank you for your letter dated 27 November 2018 regarding the outcomes-based approach to the public goods scheme, as set out in the 'Brexit and our land' consultation. I have addressed the Committee's questions broadly in the order they were raised, in some cases grouping answers where it helps explain my position more clearly.

Some of the Committee's questions overlap with recommendations made in the Committee's comprehensive report on the LCM in relation to the UK Agriculture Bill. I welcome the opportunity to explore the points raised, however, for the avoidance of doubt this is not intended to be a full response to the report's recommendations. It is also important to note the responses to the 'Brexit and our land' consultation are still being analysed. Therefore, in many cases, it is too soon to comment on policy decisions as these will be dependent on the consultation outcome and all other relevant considerations.

By way of context, the 'Brexit and our land' consultation established high-level policy proposals. This approach was purposely designed to open up an engaged and informed debate on proposals for an overarching direction for future schemes, rather than presenting a fait accompli. The results of the consultation will enable us to develop further detail for a White Paper which we intend to publish for consultation before the Royal Welsh Show. These are important matters which should not be rushed. The time between now and then will be used to undertake further stakeholder engagement and ensure appropriate analysis can be prepared.

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Modelling and pilot schemes

As outlined above, the consultation contained high-level policy proposals. Alongside these proposals, we published detailed analysis on the various Brexit scenarios. It was important to undertake this modelling to understand the potential impact of alternative trade scenarios on the agricultural sector. It would not have been appropriate to produce analysis on the impact of future policy at that stage, since the policy proposals are subject to change as the results of the consultation become clear. As I have said previously, it is important we get this right and do not pre-judge the outcome of this analysis.

Following the consultation, I reassure the Committee officials will undertake the necessary modelling and impact assessments to support the development of more detailed proposals. The development of policy will be subject to the Welsh Government's Integrated Impact Assessment (IIA). This includes detailed consideration of the likely impact on rural communities and will be regularly updated as the policy develops.

It is important to note we will not be starting from a blank page in designing new schemes. We have over 20 years of agri-environment scheme delivery to learn from, for example, GMEP (Glastir Monitoring and Evaluation Programme) provides us with lessons on the success or otherwise of previous land management interventions and with data which will help us assess the potential environmental impacts of proposed schemes. There is also an opportunity to learn lessons from schemes outside of Wales. This knowledge will feed into our scheme design to help ensure schemes are fit for purpose.

We need to ensure future schemes work for all farmers in Wales. The question on which we are reflecting, is how best to achieve this. Pilot projects clearly have the potential to play an important role however, it is too soon to determine whether piloting will be an appropriate way to test each and every aspect of the schemes. Existing data available from GMEP, combined with wider scientific evidence, may mean we do not necessarily need to pilot all aspects of long-term land management practice to establish what will work successfully. Should we continue as proposed in the consultation, we will fully consider the role of pilot schemes as we develop the next phase of policy proposals.

Engagement with farmers

Our policy proposals benefited from significant stakeholder input. We have already extensively involved stakeholders through our large-scale public engagement programme, engaging with over 1,000 farmers. Should we proceed as proposed, we will continue to engage with farmers and other land managers to understand how we can support their successful adjustment to an outcomes-based scheme. This might involved focus groups with farmers from different farm types and geographical areas to determine how to help them adapt to new approaches, for example, testing how best to communicate the benefits of adopting new technology or how best to monitor outcomes of land management.

Accessibility of schemes

The Committee rightly raised the need to ensure proposed schemes are accessible across agricultural sectors and geographical areas. As outlined in the consultation document, one of our five principles proposed for land management reform, is all farmers and other land managers should have the opportunity to access new schemes if they desire. Once we have a clear idea of scheme parameters following consultation, we will ensure we have the capacity and use of the appropriate tools to analyse policy across geographical areas and thus to ensure proposed schemes are accessible for farms of different types and locations. The development of Area Statements by NRW may also help inform spatial decision making.

Defining and monitoring outcomes

Payment for outcomes, rather than inputs, is a fundamental aspect of these proposals. This reflects the Welsh Government's desire to introduce a strong sense of "something for something" into new schemes. To be successful, an outcomes-based payments scheme must meet a number of criteria.

In order to achieve environmental targets, the outcomes we seek will need to be tangible and fair. Funding should be linked to the particular outcome(s) in question, so there must be evidence of a causal link between the actions a farmer undertakes and the delivery of the outcome. As such, the choice of actions the farmer can choose to undertake, need to be sufficiently explained. It is important to acknowledge there are many environmental pressures which the farmer cannot control and this will be reflected in the defined outcomes.

It may not always be possible to directly measure these outcomes, so in some instances a suitably robust proxy measurement may be needed. It will be imperative to find a pragmatic and operationally efficient way for these outcomes and proxy outcomes to be measured, both for the Welsh Government, and for the farmer to be able to manage their progress towards meeting outcomes.

The finer details of how each outcome may be defined, measured and monitored will be explored in the next consultation. There is a good case for using focus groups with farmers to test how we communicate these aspects, especially given the different levels of understanding across the industry. This will enable us to define outcomes and describe processes which are easy for farmers to understand.

To give an illustrative example, when delivering the outcome of improved water quality, it would be difficult to test a water course and attribute quality issues to a specific farm within a water catchment. However, soil sampling on each farm will determine if there are excessive nutrients at risk of leaching out of the soil, which would be detrimental to water quality. It would be feasible to set soil nutrient parameters for the land in question and for farmers to undertake their own soil testing to monitor their progress towards meeting those parameters. This is within the existing skill set of many. With the appropriate tools and guidance, the farmer would thus be able to understand the outcome to be achieved and be able to undertake ongoing monitoring towards achieving the outcome.

In the 'Brexit and our land' consultation, we specifically consulted on the training and advisory requirements of farmers to enable the successful delivery of public goods. The answers to this question are subject to ongoing analysis. However, I reassure the Committee with the next phase of detailed proposals this issue will also be explored in more detail.

We have social and economic objectives to achieve as well as environmental objectives, so a farmer must be able to receive a meaningful and stable income stream in return for public goods delivery. This will be especially important for those where these payments may be a major part of net farm business income.

It maybe a number of years before some of the outcomes we seek are delivered. However, if a farmer is taking sufficient measures to deliver an outcome, they should expect to be paid for it. It is proposed a hybrid scheme should therefore not be necessary, since the farmer should have the certainty of long-term income from the outset. By delivering this, we will achieve the objectives of a hybrid scheme through one, flexible scheme. Of course, appropriate analysis will be vital to ensure we get this right.

Regulation

I have already announced my intention for regulations to improve water quality to be in place in January 2020. No further announcements are planned at the current time. Following the consultation analysis, further information will be provided as part of the development of our detailed policy proposals.

WTO Agreement on Agriculture

The Committee requested information on work undertaken to ensure proposed schemes can be delivered successfully in accordance with WTO rules. Welsh Government officials have developed an excellent understanding of the WTO Agreement on Agriculture, which sets out the rules for WTO compliance, and will utilize this understanding as we develop new schemes to ensure compliance. Officials regularly engage with the UK Government and this engagement will be ongoing as our proposals develop. As part of this, officials continue to engage with relevant parties to provide appropriate advice. I am therefore fully confident new schemes will be compliant with WTO rules.

The UK Government will be responsible for notifying agriculture scheme classification for the UK to the WTO. However, it is the way a scheme is designed, in the context of the Agreement on Agriculture criteria, which will determine how schemes are classified. It is vital there are strong mechanisms in place for Welsh Ministers to exert their views when agreeing the appropriate classification of schemes and other relevant matters with the UK Government. Officials are in positive discussions with the UK Government on an agreement to govern the use of Secretary of State powers in the UK Agriculture Bill in respect of the UK's compliance with the WTO Agreement on Agriculture. This will ensures appropriate engagement with and consideration of the views of Welsh Ministers.

I will make a further announcement regarding the WTO Agreement on Agriculture presently.

Implementation

I would like to reiterate the three commitments I made last autumn:-

no decisions will be made on future schemes until all consultation responses have been reviewed;

no changes will be made to existing payments without further consultation.

old schemes will not be removed before new schemes are ready. I have announced BPS payments will remain unchanged in 2020, meaning transition to new schemes will now not begin until 2021 at the earliest. I made this decision to provide farmers with more certainty during this uncertain time. We will continue to consider the transition timetable in light of the consultation responses. Irrespective of the year it begins, however, I recognise the need for a reasonable time for transition to ensure farmers are given sufficient time to adapt; while also recognising prolonging the transition time unnecessarily would not be beneficial in allowing us to move forward and would add to the overheads of running multiple schemes in parallel.

Once a way forward is identified as a result of the consultation, we will commence the next stage of detailed work necessary to enable smooth transition to new schemes. This will include using lessons learned from previous implementation of CAP Reforms and Rural Development Plan (RDP) schemes in Wales to ensure transition is managed effectively. I note the Committee's comments regarding the potential increase in the number of applicants and reassure the Committee this will be fully considered as part of transition planning.

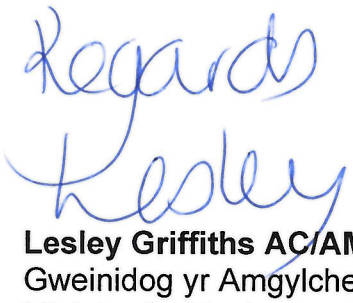
In terms of resource, a large amount of resource is currently in place for the administration of often burdensome CAP and RDP requirements. There is an opportunity for this resource to be used as we transition away from CAP and RDP. Furthermore, since the delivery of our existing EU support began with the introduction of Single Farm payment and Agri-environment schemes in 2005, there have been various technical IT advances, both in in-field technology and in remote control and evaluation systems. These provide further opportunities to explore for new schemes to ensure future administrative efficiency.

Funding

I share the concerns of the sector in relation to funding, particularly as we leave the European Union. I have stated on a number of occasions, to the UK Government, Wales must not lose out on any funding as was promised ahead of the EU referendum.

I am pleased the intra-UK allocations of convergence funding review started in January and very much welcome its aims. I am, therefore, working closely with our nominee, Rebecca Williams. I nominated Rebecca because she has the appropriate breadth of skills for the position and she will be acting independently of the CLA. She understands the needs of the family farm and having experience of working with both the UK and Welsh Government has an excellent grasp of the political and devolution situation. Furthermore, the Welsh Government support placed around her, will protect her ability to remain independent.

Within the context of leaving the European Union, this review provides an important opportunity to develop good practice for working together as four constituent nations and four Governments, with Wales playing a full and active role.



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13 February 2019

Dear Mike

At the committee meeting of 24 January I offered to provide an update, following Fisheries and Marine Senior Steering Group meetings, in relation to concerns regarding clause 18 of the draft UK Fisheries Bill.

The Fisheries and Marine Senior Steering Group (FMSSG) comprises of senior officials from the four administrations. The FMSSG meets regularly to discuss a range of issues associated with the UKs exit from the European Union, providing both a forum for open official level discussion between the Administrations, and joint governance arrangements.

Officials have discussed clause 18 of the draft Bill on a number of occasions. I am advised officials have registered my concerns on this matter and have asked DEFRA to consider and respond, taking into account the existing intergovernmental principles and practices on co-operative working.

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We welcome receiving correspondence in Welsh. Any correspondence received in Welsh will be answered in Welsh and corresponding in Welsh will not lead to a delay in responding.

The UK Government understands my concerns with the way the Bill is drafted, and how the powers could be exercised. They have assured me it is not their intention to exercise the functions in this way, and are keen to work with us to provide the reassurance I require. I expect this will be forthcoming soon, however discussion are ongoing.

I will provide a further update to Committee, following the conclusion of these discussions.

During the session a question was raised regarding 'ghost fishing'. I would like to clarify for the committee, provisions are made in relation to ghost fishing within the legislation which is being saved under the Withdrawal Act process. The appropriateness of these provisions will be considered as we develop a new post EU fisheries policy for Wales with stakeholders.

Regards

Lesley

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Minister for Environment, Energy and Rural Affairs

Cc: Mr Mick Antoniw AM
Chair of Constitutional and Legislative Affairs Committee

By virtue of paragraph(s) vi of Standing Order 17.42

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