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

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[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.**

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[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

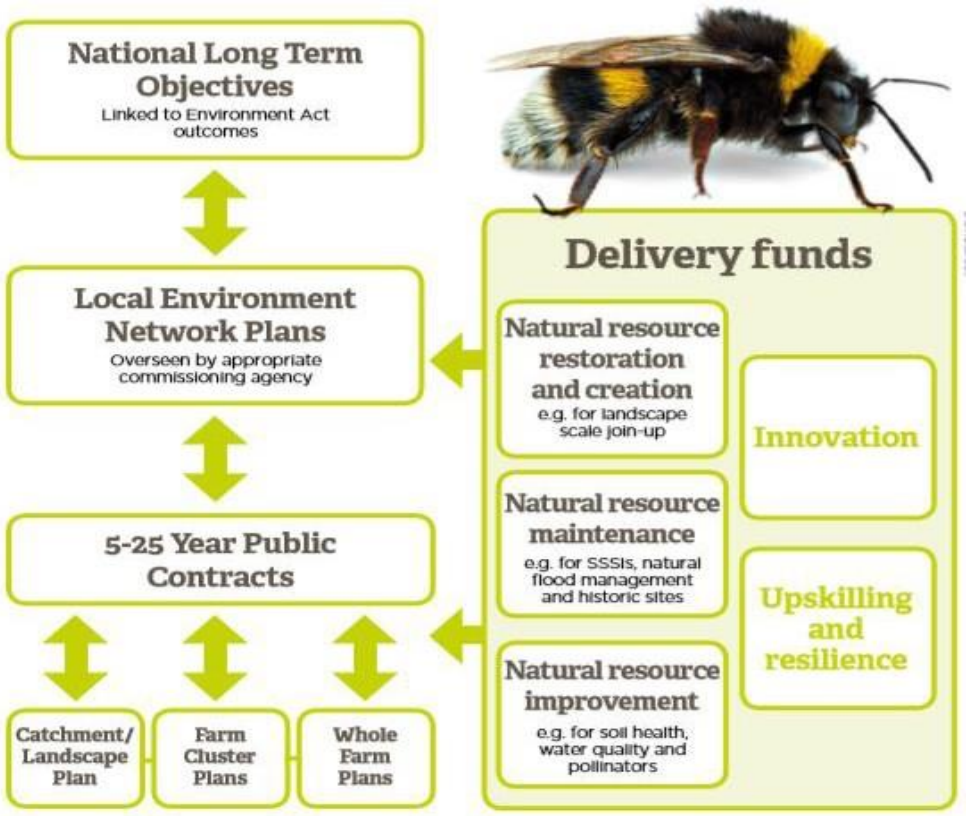
But despite these impacts, up to 95% of ammonia emissions – from farm animals and fertilisers – are unregulated in Wales. Therefore there needs to be a complete review of how agricultural air pollution in Wales is dealt with, much of it coming from intensive poultry and livestock units. For example, 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

ANNEX 2 - A BLUEPRINT FOR A PUBLIC GOODS SYSTEM

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

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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