



Report of the Citizens' Assembly on Biodiversity Loss

March 2023

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Chairperson's Foreword

It has been an incredible privilege to chair the Citizens' Assembly on Biodiversity Loss, the first national Assembly to consider this issue. Like many who participated in this Assembly, I have a new wealth of knowledge on the environment in Ireland and a new-found urgency to act to save it.

When invited to take on this role my initial response was to decline. I felt I simply did not know enough about biodiversity to take on the position. One learning that I take from being part of this Assembly, is that we can all make the choice to learn more about this important problem and act for the environment around us. Each country, group, community and person has the capacity to make a positive impact on the world around us, for ourselves and for future generations who will inhabit this precious planet of ours.



The members of the Assembly, like more than two thousand others, put up their hands to take on this civic duty. They gave willingly of their time to consider the complex question of biodiversity loss in Ireland and made recommendations as to how the State might best tackle this urgent matter. We had a wonderful mix of people in the room from all walks of life and across a huge range of ages, from the most westerly peninsula of Kerry to inner city Dublin, from Argentina and Athlone, from the heart of Ukraine to the wilds of west Cork. There were farmers and fishers, software engineers and solicitors, chariot makers and taxi drivers. The room captured a snapshot of Irish society. Each member took on the responsibility to reflect on the problem, to listen and interrogate the best information available, to consider and converse around the topics outlined in the Terms of Reference, and to eventually agree recommendations that will be presented to the Oireachtas.

A vast amount of information was given to members from a wide variety of perspectives. It is a testament to them, their commitment, their dialogue and their reflections, that they made 159 recommendations. The number of recommendations speaks to the scale and breadth of the problem





of biodiversity loss in Ireland. It also represents the extent of the material presented to the Assembly and the level of detail which members wished to pursue in their work. This stems, in part, from a fundamental disappointment in the capacity demonstrated by the State to coherently and deliberately tackle biodiversity loss. The members wish to ensure that the problems are addressed from top-down and bottom-up, at policy and grassroots levels.

I grew up participating in *'meitheal's* in rural Co. Mayo, where the community gathered and shared their time and efforts to help a neighbour (in my case in bringing in the hay). To me, the Citizens' Assembly represents a national scale *'meitheal'*. People, who had no previous connections, gave of their valuable time to construct and return informed recommendations to the Oireachtas on behalf of their fellow country men and women. It is a very impressive process to both observe and to be part of.

Like many Irish people, I was aware that a national Biodiversity Emergency had been declared by the State in 2019. I did not, however, appreciate the sheer scale of the issue. The reassuring greens of our landscape can mask the loss we are experiencing of so many key elements of our natural environment. The figures that the Assembly heard are stark. And the problems are getting worse.

We are consistently losing our hedgerows, likened by one speaker to the blood supply system of the countryside. Only 2% of the country has native woodland. Over a quarter of Ireland's regularly occurring bird species are in danger of extinction. At least one third of protected species are declining in population, an invisible tragedy happening both on land and under water. Almost 30% of our semi-natural grasslands have been lost in the last decade. Less than half of our marine environment can be described as healthy. Over 70% of our peatlands are in bad status and only a small fragment remain intact. The majority of our agricultural soil is in a suboptimal state, contaminated by nitrates and phosphates. Most worryingly, our water quality – the very foundation of life – is continuing to decline, with almost 50% of freshwater systems in Ireland in poor and deteriorating condition.

The Assembly was told that we are at a critical juncture. Without action, we will no longer be able to rely on nature for the very services we need to live. The Assembly's recommendations are a 'call to action' – they ask us all to re-evaluate our current practices across industry, agriculture, social enterprise, local government, national agencies and government departments. Future generations are depending on us to act now. Some sectoral interests and lobby groups may resist attempts to address biodiversity loss, but it is urgent that our policymakers, in particular our politicians, are supported in making bold decisions to protect, conserve and restore the natural environment in the interest of all of the people, present and future, on the island of Ireland.

A recurring theme that featured in presentation after presentation, and in many submissions, is that the laws and policies we already have are not being implemented or enforced. At a minimum, our government should not break or permit the breaking of its own or EU laws. By implementing and enforcing our current legislation and policies, we can make great strides towards addressing biodiversity loss. As an Assembly it was frustrating to listen to this litany of shortcomings and failures. This was emphasised through continuous reminders that biodiverse areas ensure better water, soil and air quality, are better protected from the fall-out of climate change, store more carbon, and also contribute to improved human health and well-being.

To protect ourselves, we must protect nature.

In these times, we hear a lot of rhetoric around national pride. As I see it, there is no more profound way of expressing a pride of place than looking after it. Our native language and indigenous cultures hold an intrinsic link with, and inherent respect for, nature and the world around us. Countless metaphors, sayings, similes and proverbs are based on natural phenomena and hold knowledge by which to know and value nature. Ancient Brehon laws protected nature. Our grandparents and generations before us did this and we can learn to do this again. The seanfhocail (proverb) which best captures, for me, that indelible need for diversity in ecosystems for them to thrive and survive is *'bheadh na coillte ciúin murach an cág'* (the woods would be quiet if only the 'best' birds sang). There is a place for all creatures, plants and wildlife to exist and, when they do, a healthy balance for all ensues.



Answers to the difficult and complex problems we face as a society can only come through dialogue. Such dialogue can only take place when there is time, trust, and a conscious effort to listen respectfully to the opinions of others, even when they differ from our own. That was the essence of this Assembly. Every voice was heard, from the cynical and suspicious to the people with a passionate interest in nature and wildlife. A majority consensus was arrived at through conversation. Our national Citizens' Assemblies are an exercise in strengthening democracy by bringing 'ordinary' people into this extraordinary deliberative process around policy. In this we ask members of society to make recommendations on issues that will be discussed, researched and responded to by policy makers. In a world where democracy is threatened and diluted, this is a process of which Ireland can be rightly proud. Our assemblies have led to much transformational societal change and, in this Assembly on Biodiversity Loss, I hope we pass on this remarkable reputation intact.

Future generations will rightly judge us on what we did, or did not do, to address a global crisis. The benefits of taking positive actions now may not be apparent for a number of decades or even centuries, but taking a whole of government approach to the whole of the environment without delay

will have valuable, lasting consequences. As a nation, we must continue our good work reducing our emissions, focusing on the circular economy, and abiding by the commitments made at the most recent UN Biodiversity Conference. Ireland has the capacity to lead the world in biodiversity conservation and environmental restoration.

I would like to thank everyone who participated in this Assembly, particularly all of those who contributed to the submissions we received from Ireland and around the world. I would like to sincerely thank the speakers who agreed to present at the Assembly, often at short notice, with an onerous task of presenting a complex subject in a brief but accessible way. I am grateful to them for so generously sharing their time, experience and expertise with members. I would like to thank the facilitators and notetakers, who allowed members' views and insights to be heard and recorded. I would like to dearly thank the Expert Advisory Group whose time, knowledge and advice was integral to the process. Their sheer commitment to helping the process at every turn was remarkable. I am deeply grateful to all of the Secretariat involved in the Assembly, in particular, Art O'Leary, Tim Carey, Cathal O'Regan, Lorraine Kavanagh and Conor O'Malley, who ensured the work ran smoothly and maintained the integrity of the process.

I sincerely thank each of the members, who are this Assembly, for their time, engagement and valuable contributions. It was a very special room to be part of. I would also like to thank their communities, friends and families for supporting members to share their time by participating in this important civic duty. I would also like to thank the members of the Assembly Steering Group for their feedback and collaboration.

Finally, I would like to thank my husband and children who were so forgiving of my absence while undertaking this work.

The Assembly learned that biodiversity encompasses all that we depend on nature for. At the end of this process, I think I can speak for all of the members in stating: it is time we start valuing our natural heritage as much as our cultural heritage, start treating our bogs like our Book of Kells, value our rivers and coastal waters as much as our multinationals, and cherish our forests as a part of our living history. In doing this, we can be good ancestors.

As chair, I am proud to present these recommendations on behalf of the members of this Citizens' Assembly on Biodiversity Loss to the Oireachtas. It is now up to our elected officials to consider these as ways in which the State can respond to the biodiversity crisis we are now living through.

Mairfidh tairbhí na hoibre a theastaíonn ar feadh na nglún
(The benefits of the work needed will last generations)



Dr Aibhinn Ní Shúilleabháin

Part I: Recommendations and Overview

1

Recommendations from the Citizens' Assembly on Biodiversity Loss



After deliberating on how the State can improve its response to the issue of biodiversity loss, the Assembly agreed 159 recommendations. These 73 high-level recommendations and 86 sectoral-specific recommendations were agreed through a mixture of consensus agreement and ballots. The results of these votes are in Appendix 3.

The nature of these recommendations speaks to the breadth and depth of the work undertaken by the Assembly. It also highlights the disappointment of the Assembly with the State's failure to address the problem, particularly with the lack of enforcement of its own laws and policies.

These recommendations emerged from the Assembly's recognition that biodiversity has an intrinsic value that should be recognised and that the essential ecosystem services it provides will be impossible to replace.

Members of this Assembly call on the Oireachtas to accept these recommendations and implement them without delay in order to curb the crisis of biodiversity loss and allow for the conservation and restoration of biodiversity for the people of Ireland, present and future. Members recognise, however, that the State cannot solve biodiversity loss alone. It is the responsibility of the whole of society, from individuals to industry across all sectors, to both call for and take action to address the issue.

1.1 Overarching Recommendations

The Assembly believes that the State's response to the biodiversity crisis requires effective leadership, clear vision and an enabling environment for action. The response to conserving and restoring biodiversity should take into account the integral heritage and cultural values of our natural world.

1. The State must take prompt, decisive and urgent action to address biodiversity loss and restoration and must provide leadership in protecting Ireland's biodiversity for future generations.
2. The Assembly believes that the State has comprehensively failed to adequately fund, implement and enforce existing national legislation, national policies, EU biodiversity-related laws and directives related to biodiversity. This must change.
3. The ambition of the State needs to be significantly increased to reflect the scale of Ireland's biodiversity crisis. Adequate funding must be made available to address this crisis. This is likely to require substantial and sustained increases in expenditure, which should be made available immediately and guaranteed in the long term.
4. The responsibility for the implementation and enforcement of biodiversity related legislation, directives and policies by all state bodies and agencies must be made clear, with each body/agency held publicly accountable for their performance. This should be supported by an independent review of implementation and enforcement of biodiversity related legislation, directives and policies.
5. The State must provide, communicate and implement a plan for the conservation and restoration of biodiversity for the benefit of its people.
6. Local leadership, local communities and the activities of the Non Governmental Organisation (NGO) sector must be actively developed and resourced to assist the State in addressing the biodiversity crisis.
7. In taking action to protect and restore biodiversity, nature-based solutions aimed at protecting, sustainably managing and restoring ecosystems should be prioritised where possible.

8. As a matter of urgency areas and species of High Nature Value, including but not limited to the national network of Natura 2000 sites and protected species, should be protected from further degradation through the implementation and enforcement of existing legislation and directives. Management plans should also include restoration programmes.
9. Ireland's varied land and seascapes across and around the island must be supported, and appropriate monitoring systems designed to suit their local environment. Higher incentives and supports should be provided to prioritise the preservation and restoration of rare and threatened species.
10. Ireland needs to recognise its global responsibility, including through our local actions, in terms of our consumerism, resource usage and our international biodiversity responsibilities. The State should advocate for a shift in emphasis in EU and international economic policy away from GDP expansion as a goal in itself and towards the goals of societal and ecological wellbeing.
11. An all-island approach and wider transboundary approach should be taken into consideration with regard to biodiversity conservation and restoration.
12. The State should renew and stand by its commitment to implement the objectives and targets of the EU 2030 Biodiversity Strategy and play a leading and supportive role in the adoption and implementation of a new EU Nature Restoration Regulation.
13. All governmental departments must explicitly acknowledge the State's declaration of a Biodiversity Emergency and take immediate and targeted action.
14. All biodiversity incentives and grants should be results-based, supported by monitoring and evaluation.
15. People in primary production industries should implement practices that conserve biodiversity and be incentivised for biodiversity enhancement and associated ecosystem service provision.
16. The State must work with all stakeholders to review Ireland's current food policy in the context of the biodiversity crisis, particularly in agriculture and marine sectors, to balance between the affordability and quality of food. This review must take into consideration vulnerable sections of the population and ensure reasonable standards of living, and result in a plan to address these issues.
17. The Irish business community needs to engage with biodiversity and show leadership in the same way that they have begun to engage with the issue of the climate crisis.
18. In order to drastically reduce the use of pesticides by at least 50% by 2030 in line with EU policy, the State should incentivise and encourage the domestic and commercial use of natural, cost-friendly alternatives, sustainable practices and biodiversity-friendly solutions. It should also regulate the use of chemical pesticides and fertilisers, while maintaining food security. This should coincide with the improvement of schemes for the safe disposal of unused hazardous materials, as well as their containers.
19. Examples of good practice in relation to biodiversity protection and enhancement should be actively identified and supported with funding, infrastructure and other supports provided to enable replication or expansion of these practices, in partnership with those who design and operate

such initiatives and schemes, e.g. the Burren Programme, Biodiversity Regeneration In a Dairying Environment (BRIDE) programme. and the Sustainable Uplands Agri-environment Scheme (SUAS).

20. The State is urged to take into account the recommendations from the Children and Young People's Assembly on Biodiversity Loss, an initiative featuring our next generation, and continue to engage with children and young people on the environment.

1.2 Strategic Approach to Biodiversity Loss

Given that the response to the biodiversity crisis requires action across the whole of the State and whole of society, the Assembly believes there is a need for coordinated action and an over-arching strategic approach at a national level.

21. There must be a whole of State approach to drafting and implementing a new statutory National Biodiversity Plan, aligned with the Climate Action Plan, supported by legislation and properly funded.

This and subsequent plans must not be constrained by electoral cycles and should have clearly defined ecological targets (e.g. the number of species on the at-risk list to be halved), with appropriate monitoring and timelines, to which all parties at national, regional and local levels are fully committed.

22. There should be a senior ministerial position, with an associated department, with responsibility for biodiversity.
23. There should be a permanent, cross-party Standing Oireachtas Committee on Biodiversity Loss, which will consider and respond to the recommendations of this Assembly, within 6 to 12 months.
24. There should be a new national independent agency to act as a centralised biodiversity coordinating structure to:
 - i. Coordinate:
 - a. Government departments in their biodiversity-related actions.
 - b. Government policy and ensure the coherence of these policies.
 - ii. Coordinate budgets related to biodiversity actions.
 - iii. Drive consultation around biodiversity actions.
 - iv. Oversee and coordinate enforcement organisations.
 - v. Implement, monitor and report biodiversity actions transparently.
 - vi. Oversee education and public engagement related to biodiversity.
 - vii. Oversee and coordinate research and data collection.
 - viii. Act as a point of contact for members of the public and industry to liaise with supports related to biodiversity conservation and restoration.
 - ix. Act in alignment with the Climate Change Advisory Council.
 - x. Set up an Emergency Task Force.
25. The new National Biodiversity Plan and all policies related to biodiversity action at national and local level should be developed in partnership with the people and sectors most affected by changes (i.e. local communities, farmers, fishers, business, etc.). In many cases consultation has to move beyond the current status quo, with trust having to be rebuilt and relationships realigned.

26. The new National Biodiversity Plan should have clear targets with ambitious and achievable timelines at national, regional and county level for halting biodiversity loss, restoring and enhancing biodiversity.
27. In addition to recent developments in judicial structures in environment and planning, the State must develop an environmental court at Circuit and District Court levels, in order to hold policy makers, businesses and citizens to account.
28. All citizens should be empowered with 'legal standing' to protect nature and biodiversity in court.
29. Each local authority must have at least one full-time dedicated biodiversity officer, the total number of which should be determined by population density, land mass and coastline.
30. All relevant departments, bodies and agencies that deal with biodiversity should have in-house ecological expertise to advise on all biodiversity related policies and activities.

1.3 The Constitution

The Assembly believes that ensuring the purposeful and necessary conservation and restoration of biodiversity will involve a range of measures, including making amendments to the Constitution. Such actions should be taken to attempt to ensure that nature is protected enough to continue to provide people with necessary ecosystem services, such as food, clean freshwater and air, and to allow people to access and enjoy a clean, safe and healthy environment, both now and into the future.

31. There should be a referendum of the people to amend the Constitution with a view to protecting biodiversity.

The proposal to amend the Constitution should include:

- a. Human substantive environmental rights, e.g. a right to a clean, healthy, safe environment; a right to a stable and healthy climate; rights of future generations to these or other environmental rights.
- b. Human procedural environmental rights, e.g. the Aarhus rights regarding access to environmental information, public participation in environmental decision-making and justice in environmental matters.
- c. Substantive rights of nature, recognising nature as a holder of legal rights, comparable to companies or people e.g. to exist, flourish/perpetuate and be restored if degraded; not to be polluted/harmed/degraded.
- d. Procedural rights of nature, e.g. to be a party in administrative decision-making, litigation, etc. where rights are impacted/likely to be impacted.

1.4 Resourcing the State's Approach to the Biodiversity Crisis

The Assembly believes that without adequate funding and resourcing, it will not be possible to curb the crisis of biodiversity loss or engage in the restoration of biodiversity. Such actions are necessary to continue Ireland's food production, to ensure access to clean freshwater and air, and to ensure access to safe, healthy environments. Members outline that funding should be made available firstly through greater efficiency and accountability for public funding, and reprioritisation between current spending and revenue raising.

When polled, three out of every four members indicated they were prepared to support and pay higher taxes, based on the principle of ability to pay, in order to make a reality of these recommendations.

32. Sufficient funding and resources to meet the challenges of biodiversity loss must be allocated to all relevant bodies to sufficiently protect and enhance biodiversity, and implement and enforce related national and EU laws, directives and policies. This must be guaranteed in the short and longer term.
33. The Government's economic strategy needs to continue nurturing and embracing fully the 'Beyond GDP' concept and ensure that the National Well-being Framework, encompassing Environment, Climate and Biodiversity, is at the very core of economic decisions made now and in the future.
34. The Well-being Framework for Ireland should be modified so that it more accurately measures economic, social and environmental progress in Ireland, with the metrics reported alongside GDP as an indication of how well Ireland is doing, and be given a strong role in shaping policy and informing the annual budgetary process.
35. The State must undertake a comprehensive review of current and future taxation and levy policies, regulations and incentives to assess their impact on biodiversity.
36. The State should significantly increase commitments and long-term funding with specific and targeted tax incentives and tax breaks to incentivise and support the regenerative economy, green technology and biodiversity activities.
37. The Assembly supports the State making Ireland a global leader in sustainable finance models.
38. The State should introduce a lower "green rate" for loans that fund biodiversity initiatives.
39. Planning levies should include a proportional contribution, ringfenced to conserve and enhance biodiversity.
40. In addition to a dedicated biodiversity budget, governmental departments and agencies should be permitted to roll over any unspent biodiversity funding into the next year.
41. The State should establish a framework for corporations and large businesses, as major users of natural resources, to provide financial contributions to fund the conservation and restoration of biodiversity.
42. Local authorities are uniquely placed to deliver biodiversity projects. Biodiversity funding and staff resources in local authorities must be significantly increased. Local authorities must be accountable and report on their biodiversity activities. Current resources must be enhanced, and biodiversity given greater priority in the councils' activities.
43. New sector-specific levies/charges on harmful imports must be introduced and ring-fenced for biodiversity. These should include:
 - i. New sector-specific levies/charges on agricultural exports introduced and ring-fenced for biodiversity.
 - ii. New sector-specific levies/charges on retailers introduced and ring-fenced for biodiversity.

1.5 Accountability and Compliance in Biodiversity

The Assembly believes that the laws currently in place regarding the protection of the environment are not being implemented or enforced, to the detriment of biodiversity and ecosystem services across Ireland. Penalties and sanctions for breaches in environmental law need to be increased and enforced.

44. There should be an immediate review of existing frameworks and mechanisms for the implementation and enforcement of biodiversity policy and legislation. This review should identify those responsible, address gaps in responsibilities and policies, highlight areas with insufficient funding and result in a plan to address these issues.
45. Sanctions for an offence should be proportionate to the offence so they adequately discourage negative behaviour (e.g. penalties should be linked to company turnover), with the offender incurring the cost of undoing the damage. Each governmental department, organisation and agency responsible for enforcement should be provided with training, a clear remit, have sufficient resourcing and should be held accountable.
46. All penalties for any breach of pollution or environmental legislation/regulations should be increased to meaningful economic levels, reflecting all damage caused plus enforcement and restoration costs, with criminal sanction where necessary.

1.6 Supporting Communities

The Assembly believes local communities are key to protecting Ireland's environment, heritage and culture, and are therefore critical to conserving and restoring biodiversity.

47. The State must provide a streamlined and easily accessible system of small grants, information and support for the public to undertake biodiversity action on residential properties.
48. The State must provide funding and infrastructural supports to local community and voluntary groups, including the settled and nomadic Traveller community, and other groups engaged in actions addressing biodiversity loss and restoration, e.g. managing invasive species, participating in citizen science, creating biodiverse spaces, and protecting and monitoring the health of the local environment, etc.
49. The State must continue to promote and support the All-Ireland Pollinator Plan as a way of supporting communities and individuals to contribute to biodiversity initiatives.
50. The State must align initiatives in Rural Regeneration and Development with local, community-based biodiversity activities.
51. The State must ensure the expansion of community gardens and allotments through local authority initiatives in conjunction with private landowners, in both urban and rural communities.

1.7 Non-Governmental Organisations

The Assembly believes the Non-Governmental Organisation (NGO) sector plays a critically important role in biodiversity in Ireland by furthering research, engaging communities and acting as a watchdog in issues related to the environment. As lack of enforcement and implementation of legislation is a major issue in Ireland, the NGOs have often filled an important gap. However, compared to many other countries, public funding supports for NGOs in Ireland is poor.

52. The value of NGOs engaged in biodiversity should be recognised in early consultations on all relevant plans, policies and projects.
53. NGOs engaged in biodiversity should be appropriately funded in the short, medium and long-term to undertake targeted schemes with measurable outcomes and strict accountability measures.
54. Core funding should be provided for collaborative work between NGOs and their partners.

1.8 Public Engagement, Education and Awareness

The Assembly believes that education and public engagement are key to empowering people to curb biodiversity loss across the country. With strengthened awareness, individuals, groups and communities across the country, in all environments from rural to urban, can be encouraged to engage in the conservation and restoration of biodiversity for one another and for the generations coming after us.

55. The public must be encouraged to live in a way which reduces their impact on biodiversity loss. The State must develop public awareness and engagement campaigns on biodiversity and biodiversity loss, to educate people on the fundamental role of biodiversity in our lives and provide resources to inform people on what they can do in their own lives to support biodiversity.
56. The State must develop an interactive website and app with easy-to-understand information on how the State and EU work together on environmental issues, where Ireland adheres to EU directives and the penalties of non-adherence. It should provide examples of good practice, information on what individual citizens can do, and details on who to contact for various issues. The website should highlight what collective action is occurring locally that people can participate in.
57. The State must establish a public information campaign to promote the benefits of buying local and seasonal produce.
58. Local authorities should play a central role in informing people of the importance of biodiversity in their areas.
59. There should be mandatory and ongoing biodiversity training provided for any civil or public servant whose work impacts on wildlife and biodiversity.
60. The Natura 2000 biodiversity sites provide opportunities for education for local communities. A programme should be established to promote awareness of the importance and vulnerabilities of these sites.

61. The National Parks and Wildlife Service (NWPS) should be funded to expand its education remit to make the public more aware of the importance and current conservation status of our protected habitats and species.
62. Children and young people are integral to ensuring the environment is protected. In line with the current National Strategy on Education for Sustainable Development – ESD to 2030, the Department of Children, Equality, Disability, Integration and Youth with the Department of Education, the Teaching Council, the National Council for Curriculum and Assessment, and the Teacher Education Support Service(s) should continue to engage in meaningful curriculum reform and teacher education to explicitly incorporate teaching and learning on biodiversity in early childhood, primary and post-primary curricula.
63. In line with the current National Strategy on Education for Sustainable Development - ESD to 2030, the Department of Further and Higher Education, Research, Innovation and Science and relevant agencies, such as the National Skills Council, Regional Skills Fora, Expert Group on Future Skills Needs, SOLAS etc., should work with further and higher education providers to develop a greater number of easily accessible further and higher education programmes, apprenticeship and community-based education related to biodiversity and environmental sciences.
64. School grounds and local public amenities need to be developed as a support to a diverse and meaningful nature education. In line with this, basic biodiversity training for school staff, including maintenance and grounds staff, should be rolled out on a national basis.
65. The Green Schools Initiative should be reformed to ensure nature and biodiversity feature in the initial stages of the programme.

1.9 Biodiversity Research and Data

In order to monitor biodiversity and the impacts on biodiversity of various activities and policies, it is essential that biodiversity and related resources are regularly measured against high-quality baseline data.

66. The State must develop a research strategy to support the national and EU Biodiversity, soil and water strategies, involving all agencies, higher-education institutes and other organisations.
67. The State must create, publish and maintain an integrated habitat, species and land-usage map for the island of Ireland to identify habitat loss and improvement, to support local community awareness and to inform policies and actions of state bodies and organisations.
68. The State must increase funding to bodies and agencies, including the National Biodiversity Data Centre, local authorities, and State agencies such as the Natural History Museum and Teagasc, to carry out research related to biodiversity.
69. The State must fund a programme of work to promote and support citizen science (scientific research conducted with participation of the public) on biodiversity-related research.
70. The National Biodiversity Data Centre must be established on a statutory basis, its funding secured, and its role enhanced, particularly with regard to data generation, education, community engagement and citizen science.
71. Increased funding should be made available for the research of new and emerging best practices that offer alternatives to overexploitation of natural resources.



1.10 Energy Production

In terms of its energy production Ireland has the potential to tackle the climate crisis, while also addressing the biodiversity crisis. In this, Ireland should reinforce its ambitions to produce renewable energy.

72. The State must prioritise the shift to all forms of renewable energy to achieve decarbonisation, while ensuring that these developments undertake full consideration of local biodiversity, do not negatively impact biodiversity and enhance biodiversity wherever possible.
73. The State should ringfence a percentage of funds raised through all energy production for biodiversity conservation measures.

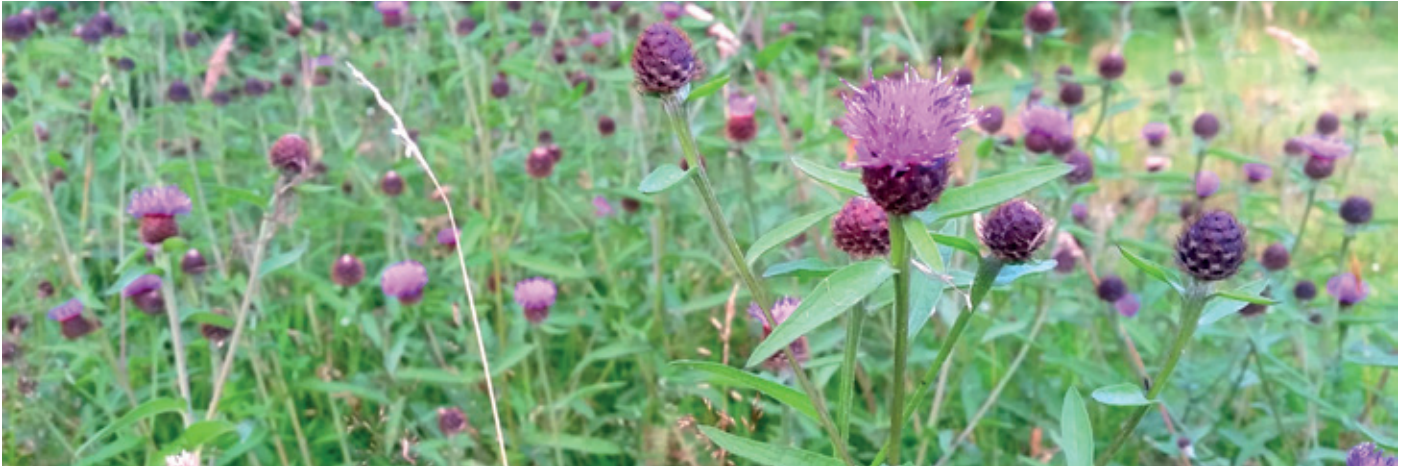
1.11 Agriculture

As the majority of land across Ireland is used for agriculture, the Assembly believes that the agriculture industry and its approach to land-use have a major impact on biodiversity. Biodiversity underpins our production system providing pollination, nutrient recycling, soil structure, pest control, regulation of water supply, etc. Biodiversity is currently undervalued in our agriculture production system and policy framework.

Acknowledging farmers as the custodians of the land, with a rich knowledge and understanding of the environment, the agriculture industry can make the most impact on conserving and restoring biodiversity.

74. Current State policy on the management of biodiversity on agricultural lands is not sufficient and requires fundamental review and change to support and incentivise farmers and landowners to protect and restore biodiversity.
75. The Government must ensure that Ireland's food production is in line with commitments to the Agenda 2030 Sustainable Development Goals, the Paris Agreement, the EU Green Deal and current legal obligations to protect biodiversity, genetic resources (e.g. seed diversity) and water quality. It must phase out all environmentally harmful subsidies in the agricultural and food sector.

76. Government departments, State and Semi State agencies shall ensure their work is done in a way which ensures collaborative planning, consultation in decision-making and implementation with farmers, local authorities and community groups. This must be underpinned by acknowledging that there is a need for local responses to local environments. Community led, peer-to-peer farming initiatives must maintain their community-led ethos once they are rolled out nationwide. (The Burren Programme and the BRIDE projects provide potential templates.)
77. Biodiversity targets in national schemes (i.e. Common Agriculture Programme (CAP)/ Agri-Climate Rural Environment Scheme (ACRES)) must be made significantly more ambitious, detailed and focused on the medium to long-term. Funding must be increased to support this ambition.
78. Public incentives and payments for farmers must not restrict them in their ambition to make change for the benefit of biodiversity. All biodiversity incentives for farmers shall be results-based over the whole farm, with farmers who protect and enhance biodiversity rewarded and paid for the ecosystem services they contribute.
79. Increased access to agri-environmental and payments-on-results schemes must be available to all farmers with commensurate funding.
80. The State must support community leadership and peer-to-peer support in order to share knowledge and assist local farmers and communities to understand and replicate good biodiversity practice.
81. The State must further subsidise and incentivise organic farming and locally grown produce. Sufficient resources must be deployed to support an ambitious implementation of Ireland's Strategy for the Development of the Organic Sector for the period 2019 to 2025, to ensure a more supportive environment for the development of organic food and farming in Ireland and for subsequent policies relating to the medium to long-term development of the sector.
82. Bord Bia must significantly increase the promotion of the organic farming sector in Ireland and actions supporting the Farm to Fork strategy.
83. People must be encouraged to consume a more plant-based diet.
84. Biodiversity awareness and education training programmes need to be instigated and improved across the agriculture sector, including for farmers, advisors, policy makers, food processors and retailers.
85. The Green Cert must be adapted by increasing the proportion of credits for sustainable farming. Modules should include the identification and management of nature/biodiversity features on farmland, combining latest scientific information and traditional knowledge, recognising and preserving skills built by generations of farmers.
86. The State must offer incentives through agri-environment schemes to farmers that achieve high soil quality status, either from the start of the monitoring programme or as a result of their employing remedial measures.
87. In line with EU Soils Strategy, a National Centre for Soil Science must be established based on up-to-date technology where soil testing of physical, chemical and biological properties of soil is subsidised for farmers.
88. The State must require sufficient information on commodities' labels and menus to improve consumer understanding of the origin of their food and the impact of their choices on biodiversity/environment.



89. More farms and farmers must be encouraged and rewarded for adopting the Silvopasture approach to farming – planting native deciduous trees in amongst pasture lands.
90. The State must encourage use of multi-species mixtures and phase out use of monoculture grass seed mixtures.

1.12 Freshwater

Ireland has a rich network of rivers and streams (over 84,800 kms) and over 12,000 lakes which cover about 2% of its land area. They connect our uplands and coasts, and our urban and rural areas. Three decades of monitoring of water systems has shown the ongoing loss of water quality, which is severely impacting the biodiversity of our rivers and lakes and has a devastating effect on the quality of drinking water. The poor condition of our freshwater systems is an urgent problem that requires an immediate and coordinated national response. Suitable actions must be taken to reduce the impact of nutrients, particularly nitrates, on our freshwater systems.

91. The management of our freshwater systems requires immediate action. It requires increased level of ambition, increased resources for Water Framework Directive implementation (and therefore aquatic biodiversity protection and mitigation), a focus on water quality and aquatic biodiversity outcomes, clarity on roles and responsibilities and accountability for achievement of the outcomes.



92. The State must provide a single body to oversee and co-ordinate the many relevant bodies that manage, implement, and enforce legislation and policies relevant to freshwater.
93. There must be urgent increases in investment by Irish Water to build new and improve existing water treatment plants to prevent the unacceptable discharge of raw or partially treated sewage into any fresh or marine waters. The current timelines and targets are inadequate.
94. The management of water catchment areas must be greatly improved, with assessments of water quality to be updated regularly to guide action on restoring water quality.
95. Riparian buffer zones, related to agriculture, forestry, industry and extractive processes and urban development must be expanded and take into account local conditions to prevent nutrient and sediment run-off. Schemes must be put in place to incentivise landowners to protect waterways, with incremental subsidies depending on the width and quality of buffer zones.
96. Local and other relevant authorities must be held responsible for maintaining and improving the conditions of rivers in their areas, working with each other and with State agencies, such as Office of Public Works (OPW), Coillte, the Department of Agriculture, Food and the Marine, Inland Fisheries Ireland, industry, farmers, private landowners, community groups, etc. Furthermore, local authorities and landowners must maintain the highest standards to riparian zones along the rivers in their areas.
97. It is imperative that penalties for polluting freshwater are significantly increased and enforcement considerably improved.
98. Farmers must have access to continuous training and up to date research in actions and land management practices that protect freshwater biodiversity.
99. The State must increase support for community groups and NGOs that are working on key projects to improve freshwater systems – e.g. support for Irish Rivers Trusts, group water schemes, angling and community groups.
100. The 1945 Arterial Drainage Act is no longer fit for purpose and must be reviewed and updated in order to take proper account of the biodiversity and the climate crisis.
101. Nature-based solutions must be included in State and community programmes to tackle flood management and should include whole of catchment area hydromorphology planning and restoration.
102. The Environmental Protection Agency (EPA), supported by Inland Fisheries Ireland and an expert group, must conduct a complete analysis and survey of all catchment areas to develop a National Hydromorphology Plan.
103. Motorway attenuation pools must be more widely used and incorporate the use of biodiverse wetlands. The forestry and extractive industries must have the highest standards of attenuation pools and sediment traps applied to their drainage activities.
104. Soil sealing poses a growing threat to our waterways and hydromorphology through surface water run-off. New regulations must be developed to limit the permissible area of soil sealing around all new buildings and other developments that are subject to planning. All other surface finishes must be made of permeable surfaces.

1.13 Marine and Coastal Environments

Ireland has a vast marine environment, which is currently under-recognised and undervalued. The Irish State has committed to designating 30% of Irish waters as Marine Protected Areas by 2030. This is in line with our commitments under the EU Biodiversity Action Plan. However, the Assembly heard that Ireland has failed to achieve “Good Environmental Status” for over half of the descriptors (6 of 11) in the existing EU Marine strategy framework, including in biological diversity.

105. The State shall designate and effectively manage an ambitious network of Marine Protection Areas, in line with EU targets of 30% of Ireland’s Maritime Area by 2030.
106. The State shall create a National Marine Biodiversity Coordination Body to have responsibility for the implementation of Marine Protected Areas, the achievement of Good Environmental Status and wider marine conservation and restoration initiatives.
107. The State must implement ambitious marine conservation measures under the Marine Strategy Framework Directive to ensure ‘Good Environmental Status’ for Ireland’s seas.
108. A proportion of funds raised by the State through fines and levies for activity in the marine environment must be used for the protection and restoration of marine biodiversity.
109. The State must act to ensure fish stocks in Irish waters are well managed through quotas, monitoring and no fish zones, supporting income transition for fishers who will need to change their way of earning as policies on Marine Protected Areas and offshore energy evolve, for the necessary conservation and restoration of biodiversity.
110. As a matter of urgency, the State must increase actions and legislation to considerably reduce single use plastics and microplastics to minimise pollution within its waters and along its shores.
111. The siting, development and construction of energy generation at sea (both pylon and floating) must be done in close collaboration with the fishing community and relevant marine biodiversity authorities. (See also recommendation 72).
112. All enterprise involved in marine extraction or exploration must have a strict biodiversity net gain clause attached to their development permission and must be responsible for the ongoing and future management and enhancement of the biodiversity of their sites.



1.14 Peatlands

Ireland's peatlands are an integral part of our national culture and heritage. They are also one of our richest resources of biodiversity and carbon sinks. Restoration of peatlands will have clear benefits for both climate and biodiversity, as well as health benefits for local communities and potential new revenues through eco-tourism.

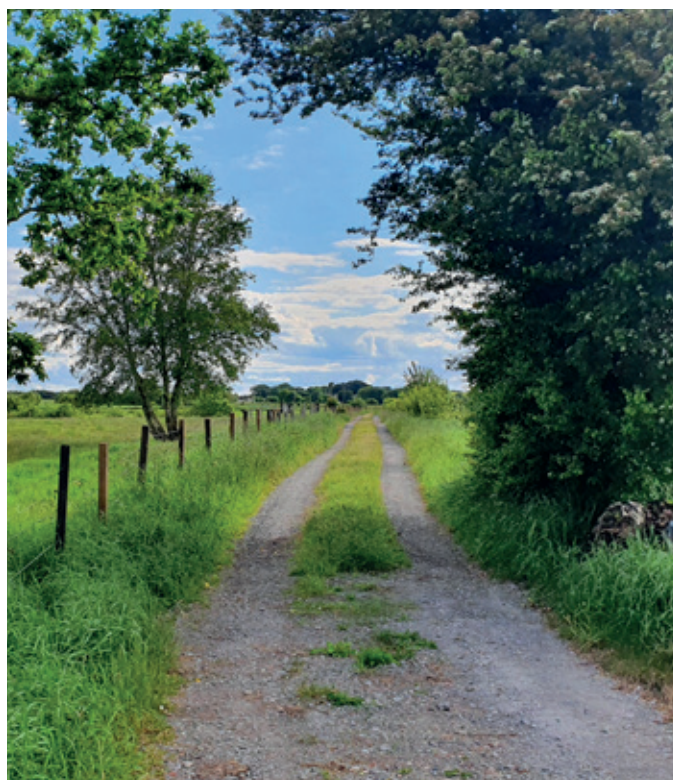


113. An updated National Peatland Action Plan must be developed with clear, measurable, realistic and timed goals and sufficient funding to protect and restore peatlands.
114. The cessation of turf-cutting on protected areas must be fully implemented and enforced. To facilitate a true 'just transition', the State must provide adequate financial assistance to offer viable alternatives to people currently predominantly reliant on peat for heating their homes.
115. The State must promote community engagement and wider awareness of the value of peatland restoration for nature and culture.
116. The remits of Bord Na Móna and Coillte must each be reviewed to include a focus on peatland restoration and rehabilitation projects, with targeted outcomes on biodiversity conservation. The results of these outcomes must be freely available and published annually.
117. All enterprise involved in the harnessing of renewable energy from or on all peatland must have a strict biodiversity net gain clause attached to their development permission and must be responsible for the ongoing and future management and enhancement of the biodiversity of their sites.
118. The State must develop a cross-agency response team to review practices of prescribed burning and address issues around implementation of guidance and recommendations to stop illegal burning.
119. The State must encourage and incentivise peatland owners to engage in the active protection of peatland biodiversity through appropriate management and restoration activities.

1.15 Forestry, Woodlands and Hedgerows

Ireland ranks lowest in Europe for tree cover. There has been a substantial increase in forest cover in the last century but much of this has been through monoculture plantation, which has issues related to water quality and biodiversity. Improved forestry management, together with native woodland enhancement and creation, have the potential to contribute solutions for nature, water and climate. The Assembly believes that Ireland's woodlands and forestry require a change in management approach for the benefit of its people now and the generations to come.

120. There is a conflict of interest between business aims and corporate responsibility, particularly for State agencies. The State must fundamentally reassess the constitution, goals and operations of Coillte and the 1988 Forestry Act (as amended). This reassessment must ensure biodiversity protection and positive eco-system services are core objectives for Coillte, alongside providing higher quality timber, meaningful employment and benefits to the community.
121. State-owned woodlands should be recognised and managed as a strategic, long-term national asset for the benefit of the common good.
122. Afforestation requires long-term goals and timelines. The State must legislate and provide funding for long-term investments in forestry, with strategic and ambitious emphasis on native woodlands. In addition, the State must ensure its afforestation strategy is not negatively impacting on biodiversity by establishing an effective monitoring system for the Forestry Programme.
123. A new national strategy for the protection, maintenance, restoration and expansion of Ireland's network of hedgerows must be developed urgently. Existing legislation and regulations regarding hedgerows must be reviewed, strengthened and fully enforced, with due regard to public safety. Sufficient results-based incentives must be made available to support all aspects of their proper management. In particular, the new CAP schemes should recognise and reward good hedgerow quality.





124. Forests currently planted and those already felled on peatlands are a significant and historic problem. The State should remedy this issue promptly and on a significant scale.
125. The Department of Agriculture, Fisheries and the Marine must implement incentives for State, Semi State and commercial bodies to establish more nurseries for the cultivation of indigenous hedgerow species and indigenous broadleaf tree species.
126. A significant proportion of profit earned through Coillte's commercial activities should be ringfenced and re-invested directly back into biodiverse forestry initiatives.
127. The State must plan for appropriate felling management, including provision for continuous cover to encourage a more biodiverse and sustainable mixed forestry management model.
128. The Department of Agriculture, Fisheries and the Marine must ensure that licensing requires site-by-site ecological assessments to ensure that biodiversity is not negatively impacted both within and outside protected sites.
129. The use of pesticides in public and private forestry is to be reduced by at least 50%.
130. Hedge management courses and certification should be reintroduced and it should be a requirement that all hedge cutting contractors and their employees complete such courses, and be licenced.

1.16 Protected Sites and Species

Ireland's network of protected sites for habitats and species of national and international conservation concern are a key aspect of our efforts to restore and enhance biodiversity. The Assembly believes that the designation and management of protected sites and species has not been sufficiently overseen by the State. This has led to failures in managing and protecting biodiversity, conflict with stakeholders, including landowners, and a lack of awareness across society of the existence and status of our protected sites and species.

131. The designated sites and species are among our most important cultural, heritage, and biodiversity resources and their management needs to be sufficiently resourced to meet our EU obligations.
132. The National Parks and Wildlife Service and other relevant agencies must be provided with targeted funding to provide sufficient resources and staff to manage designated sites and protect species, produce and implement management plans, enforce protections for designated sites on land and sea.
133. Protected sites do not exist in isolation. These ecosystems require connectivity with areas outside these sites, with links between protected sites. These connections and links need to be considered, protected and improved in local authority planning and other activities.
134. The hunting open season order list must be reviewed regularly to ensure alignment with the endangered species list.



1.17 Invasive Species

Invasive species are a major threat to biodiversity nationally and internationally and have the potential to impact human wellbeing.

135. The management of invasive species needs to be carried out on an all-Island basis.
136. Biosecurity must be increased at all points of entry to the country, in line with best international practice.
137. The State must provide funding, education and infrastructural supports to engage local community groups in appropriately managing invasive species, which negatively impact native habitats and species.
138. The State must produce a multi-agency National Invasive Species Plan to manage, monitor and collate information on the distribution of invasive species across the country. This should be used for coordinated control programmes and community awareness campaigns.
139. The State must introduce effective population controls regarding invasive animal species, such as non-native deer and mink.
140. The State must act immediately to put a timeline on the phasing out of, and eventual ban of, the sale of invasive species, e.g. Cherry Laurel.
141. Regulations for the importation of recreational wildlife, classed as invasive species, must be reviewed.
142. Schemes to incentivise people to buy native plants, shrubs and trees, including native fruiting trees and shrubs, to support garden biodiversity over non-native species should be devised and encouraged.

1.18 Urban and Built Environment

Urban environments have an enormous role to play in the conservation and restoration of biodiversity. This is particularly important considering the housing crisis Ireland is currently experiencing and in view of the value of green spaces to populations living in urban environments. Integration of nature and nature-based solutions within urban areas can improve human wellbeing in these areas.

143. The State must reform and update the planning and building regulations and legislation to better consider biodiversity in all new developments, with specific evidence-based and locally relevant biodiversity and environmental measures (e.g. inclusion of nesting bricks, restriction of artificial grass, green planting, corridors, sand and water, etc.).
144. Planning policy must be updated to require all new developments to have a significant net-gain for the environment and biodiversity.
145. In line with international best practice, the State must increase mandatory requirements for a percentage of green spaces that support biodiversity in urban areas.
146. Local authorities must raise the status of biodiversity to ensure that this is addressed and championed at the highest level in the organisation.

147. The National Parks and Wildlife Service (NPWS), as well as bodies prescribed in legislation with regard to biodiversity and planning, including An Taisce, should be properly funded and resourced to effectively carry out their planning and development roles.
148. The State must utilise public spaces, such as bus shelters and roofs, to create green corridors, green walls/roofs etc., to support pollinators and promote biodiversity.
149. Authorities must incorporate ecological expertise in decision-making regarding planning.
150. All Environmental Impact Assessments and Reports, and Appropriate Assessments and Natura Impact Statements must automatically be lodged with the National Biodiversity Data Centre so the data and information can be stored and made publicly accessible, with sufficient funding provided for such action.
151. Each Local Authority must include a Green Infrastructure Strategy in County/City Development Plans which includes corridors between urban and rural biodiverse habitats, creation of new biodiverse spaces, retrofitting of existing spaces and restoration of degraded biodiversity.
152. The State must introduce tax incentives and grants for capital investment in retrofitting existing buildings with biodiverse initiatives (roof gardens, vertical gardens etc.).
153. The State must review An Bord Pleanála and local authority legislation and practices to take full cognisance of the Aarhus Convention, create more transparency and grant citizens greater access to information and inclusion in decision-making related to environmental issues in planning.
154. As part of the new National Biodiversity Plan relevant Government departments and agencies must publish central advice for local authorities on incorporating nature based solutions and ecological features into new developments, ecosystem restoration, green infrastructure and biodiversity, addressing pollution issues (chemical, light, etc.), reinforcement and/or offsetting that can be linked to achieving local and national biodiversity objectives that would be identified in development plans and local area plans.

1.19 Industry, Business and Tourism

The Assembly believes that the needs of Ireland's economy must be balanced with the need to conserve and restore our natural resources and biodiversity.



155. State and Semi State agencies and bodies responsible for all major state infrastructure should prioritise the protection and restoration of biodiversity in strategic planning, with measurable goals and timelines that are held to account by a newly established, independent, central agency (see recommendation 24).
156. In addition to actions around the climate crisis, businesses should be required to take biodiversity into account through programmes which promote industry's engagement with biodiversity.
157. Ireland's tourism industry is dependent on the protection and good status of the environment and important biodiversity sites are often high amenity sites. The promotion of eco-tourism and amenities should therefore be consistent with biodiversity conservation and visitors should be managed to ensure that biodiversity is not damaged. Opportunities to include biodiverse positive areas and projects should be encouraged as an additional tool within the overall promotion of Ireland's tourism industry.
158. A scheme should be developed, similar to the Farming for Nature initiative, in which businesses can demonstrate real and substantial biodiversity credentials.
159. All large businesses and financial organisations must develop a mandatory assessment and disclosure process of harmful impacts to biodiversity, with a mandated role (similar to a Health and Safety or Well-being Officer).

2

Background and Main Features of the Citizens' Assembly on Biodiversity Loss



2.1 Introduction

The Citizens' Assembly on Biodiversity Loss was one of four Citizens' Assemblies contained in the Programme for Government, Our Shared Future¹.

In February 2022, following debates in both Houses, the Citizens' Assembly on Biodiversity Loss was formally established by way of resolutions of Dáil Éireann² and Seanad Éireann³.

2.2 Terms of Reference

The resolutions set out the Terms of Reference for the Citizens' Assembly on Biodiversity Loss are as follows:

“A Citizens' Assembly on Biodiversity Loss, with a total of 100 members including an independent Chairperson and 99 randomly selected members of the public, shall be convened to examine how the State can improve its response to the issue of biodiversity loss, and to bring forward proposals in that regard.

The Assembly shall consider, inter alia:

- the international, European, national, regional and local dimensions to the biodiversity emergency;
- the threats presented by biodiversity loss and the opportunities to reverse this loss;
- the main drivers of biodiversity loss, their impacts and the opportunity of addressing these drivers;
- the perspectives of the general public, representative groups, advocacy groups, experts and policy makers on biodiversity loss, and its impact on Ireland;
- opportunities to develop greater policy coherence and strategic synergies between biodiversity policy and other policy priorities including, but not limited to, economic development, climate action, sustainable development, agriculture and tourism;
- opportunities to promote greater public understanding of, and support for, urgent action in response to the biodiversity emergency; and
- opportunities to improve the State's response to the challenge of biodiversity loss, how that response can best be resourced and implemented in a strategic and coordinated manner, and how progress can be measured.

The Assembly shall:

- commence and run in parallel with the Dublin Citizens' Assembly;
- hold its inaugural meeting in April 2022;
- adopt a work programme designed to allow for the completion of consideration of the topics within an eight-month period;
- conclude its work and submit its report ideally no later than nine months from its date of commencement, and sooner if possible;
- have authority to determine a revised timeline for completion in the event of unexpected disruptions caused by the Covid-19 pandemic or other extraordinary circumstances;
- implement continuous improvement and adopt innovative working methods informed by learnings from previous Citizens' Assemblies and international best practice, including in relation to the methodology for member recruitment, to the running of Assemblies subject to public health measures, and to developing internal capacity to ensure the quality of the deliberative process;
- preclude from membership of the Assemblies any individual who is either:
 - (i) a politician currently serving in either House of the Oireachtas or the European Parliament;

¹ <https://www.gov.ie/en/publication/7e05d-programme-for-government-our-shared-future/>

² <https://www.oireachtas.ie/en/debates/debate/dail/2022-02-22/9/>

³ <https://www.oireachtas.ie/en/debates/debate/seanad/2022-02-23/10/>

- (ii) a lobbyist as provided for under the Regulation of Lobbying Act 2015; or
- (iii) a person unwilling to commit to adhering to public health measures as prescribed by Government and public health authorities from time to time;
- have a Chairperson appointed for a period of up to twelve months, with scope to extend the term should circumstances warrant, and that an honorarium should be paid to the Chairperson based on a per diem rate to be sanctioned by the Department of Public Expenditure and Reform;
- make payment of a nominal honorarium to Assembly members to recognise their civic commitment;
- have staff assigned to provide a Secretariat to the Assembly and to support the Chairperson;
- agree its own rules of procedure and work programme to enable the effective conduct of its business in as economical and efficient a manner as possible;
- determine all issues by a majority of the votes of members present and voting, other than the Chairperson who will have a casting vote in the case of an equality of votes;
- operate in an open and transparent manner, including by live streaming public proceedings; and
- make a report and recommendation(s) to the Houses of the Oireachtas on the matters before it. On receipt, the Houses of the Oireachtas will refer the report of the Assembly for consideration to a relevant Committee of both Houses; the Committee will, in turn, bring its conclusions to the Houses for debate. Furthermore, the Government will provide in the Houses of the Oireachtas a response to each recommendation of the Assembly and, if accepting some or all of the recommendations, will indicate the timeframe it envisages for implementing those recommendations.”

2.3 Membership of the Citizens’ Assembly

The Citizens’ Assembly on Biodiversity Loss was comprised of 100 members, including 99 members of the public, randomly selected from households across Ireland, and an independent Chairperson appointed by the Taoiseach.

2.3.1 Enhancing the representativeness of the Assembly

Informed by the experience of previous assemblies and international best practice, the Government and the Houses of the Oireachtas mandated two important changes to how members were selected.

These changes were designed to improve the diversity of Assembly membership and ensure that it was as broadly representative as possible of the general public. The changes introduced entailed:

- (i) broadening the eligibility criteria, and
- (ii) adopting an improved recruitment method, in line with international best practice, with reference in particular to the OECD Recommendation on Open Government⁴, the OECD Good Practice Principles for Deliberative Processes for Public Decision Making⁵ and countries with extensive experience of citizens’ assemblies, including Canada and Australia.

We are particularly grateful to Iain Walker, the Executive Director of newDemocracy in Australia, for his advice and support in the management of the recruitment process.

⁴ OECD (2017) <https://www.oecd.org/gov/Recommendation-Open-Government-Approved-Council-141217.pdf>

⁵ Chwalisz, C. (2020), “Good practice principles for deliberative processes for public decision making”, in *Innovative Citizen Participation and New Democratic Institutions: Catching the Deliberative Wave*, OECD Publishing, Paris, <https://doi.org/10.1787/b40aab2a-en>.

2.3.2 Broadening eligibility criteria

Previous citizens' assemblies had restricted membership to people who were enrolled on the electoral register, leading to the exclusion of certain sections of Irish society, including non-nationals and persons marginalised or otherwise distanced from the democratic system.

In order to ensure that the Citizens' Assembly on Biodiversity Loss was optimally representative of wider society, eligibility was broadened to allow any adult resident in the State to potentially become a member of the Assembly⁶. This had the effect of including people who were not Irish citizens and others who for whatever reason were not enrolled on the electoral register.

2.3.3 Changes to recruitment methodology

For the first time, the recruitment process was based on written invitations to randomly selected households (see Appendix 1). This differed from the methodology used by previous assemblies, which relied on polling companies conducting door-to-door interviews to select members. This new methodology was designed to improve the geographic spread of members and to increase the quality and inclusivity of the random selection process.

2.3.4 Invitations

A total of 20,000 households in the State received a postal invitation from Taoiseach Micheál Martin T.D. to nominate one adult from that household to apply to become a member. The sample of households that received invitations was randomly generated from the

GeoDirectory database of households, which is the most comprehensive available database of households in the country

2.3.5 Applications

Written invitations were addressed generically to "The Householder", as distinct from named persons within the household. Each household was asked to nominate just one adult from that household. Invitations were non-transferable between households.

Applicants from eligible households were asked to register their interest in becoming a member of the Assembly, either by post, by phone or online. As part of the registration process, additional key demographic information was requested from applicants.

2.3.6 Response rate

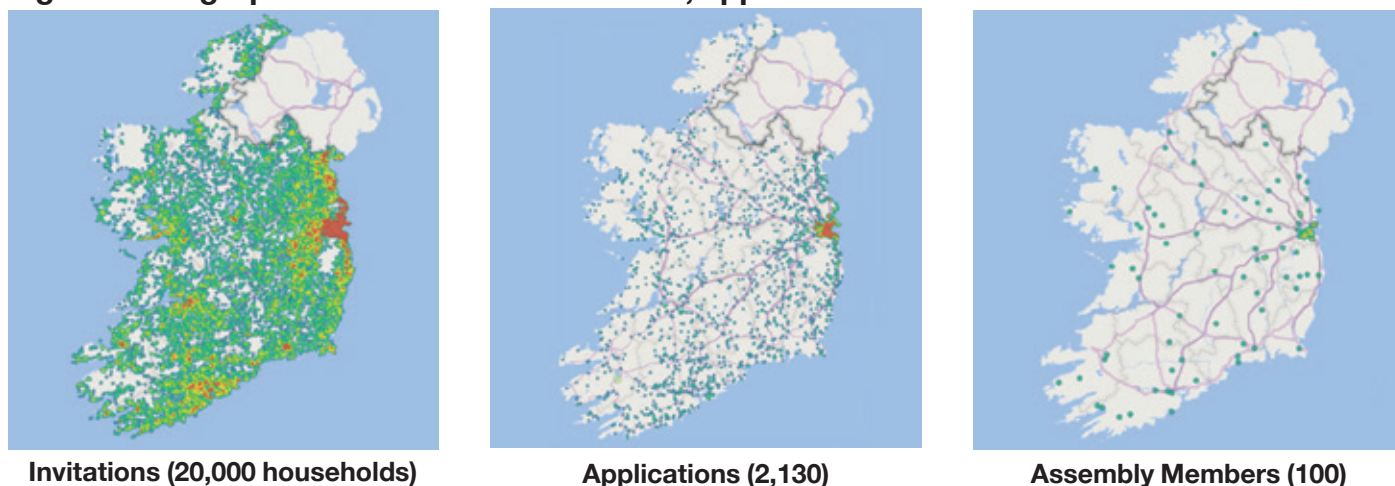
A total of 20,000 invitations were issued, with 2,261 responses received, of which 2,130 were valid applications. 131 applications were deemed invalid.

The overall response rate of over 10% compares favourably with the international experience for Citizens' Assemblies, where the response rate typically ranges between 3% and 5%.

2.3.7 Geographic distribution of invitees, applicants and members

The maps below show the spread and concentration of invitations, applications and members across Ireland.

Figure 1 Geographical distribution of invitees, applicants and members.



⁶ With the exception of those categories indicated in the Terms of Reference, namely (i) a politician currently serving in either House of the Oireachtas or the European Parliament; (ii) a lobbyist as provided for under the Regulation of Lobbying Act 2015; or (iii) a person unwilling to commit to adhering to public health measures as prescribed by Government and public health authorities from time to time.

2.3.8 Sortition criteria

The final selection of public members of the Assembly was based on a stratified random selection of 99 members of the public, using six demographic variables:

- Gender
- Age
- Location
- Occupational status (proxy indicator for socio-economic status and disability)
- Language (proxy indicator of nationality)

2.3.9 Demographic profile of members

Using a demographic profile of the general public based on CSO Census data, targets were set for selecting members by gender, age group and location by region. Supplementary criteria of language and occupation were used to optimise diversity and inclusivity of membership.

Tables 1 – 3 below show the targets, and results, of the stratified random selection, while Tables 4-5 indicate the wider diversity and inclusivity achieved among the group.

Table 1: Gender profile of assembly members

Gender	Target	Outcome
Female	50	50
Male	49	49
Total	99	99

Table 2: Age profile of assembly members

Age	Target	Outcome
18-24	12	12
25-44	36	36
45-64	32	32
65 plus	19	19
Total	99	99

Table 3: Geographic profile of assembly members

Location by region	Target	Outcome
Dublin	27	27
Rest of Leinster	27	27
Munster	26	27
Connaught - Ulster	19	18
Total	99	99

Table 4: First spoken language

Language	Outcome
English	91
Others (Polish, Romanian, Portuguese, Ukrainian, Lithuanian, Spanish, Turkish, Croatian)	8
Total	99

Table 5: Occupational status

Occupational status	Outcome
Student	9
Looking after home / family	4
In paid employment (as an employee)	45
Farmer	6
Unemployed	2
Self-employed	18
Unable to work due to permanent sickness or disability	0
Retired	15
Total	99

2.3.10 Review of the recruitment methodology

The membership profile of the Citizens' Assembly on Biodiversity Loss shows how effective the recruitment process was in optimising the representativeness and inclusivity of the Assembly.

The alignment of targets and results based on core demographic criteria (gender, age group and location), supplemented by additional diversity and inclusion criteria, means that membership of the Assembly was as broadly representative as possible of Irish society. Several factors were important in ensuring that the profile of the membership successfully mirrored that of the general population, including:

- broadening eligibility criteria to include any adult living in the State;
- issuing initial invitations to a large cohort of households (20,000);
- generating a high response rate to invitations issued (>10%), including through providing multiple response channels (online, telephone and postal);
- gathering key demographic information (gender, age group and location) to support a robust stratified random selection process;
- gathering secondary demographic indicators (language, employment status and occupation) to optimise diversity among the membership.

2.4 Chairperson

Dr Aoibhinn Ní Shúilleabháin was invited by Taoiseach Micheál Martin, TD, to chair the Assembly as the 100th member. In this role she was responsible for the smooth running of the Assembly, in accordance with the rules and Terms of Reference contained in the resolution of

the Houses of the Oireachtas, and was the sole judge of order. Should a casting vote have been required in deciding on any recommendations, this would also have been her responsibility. She was supported in her work by the Secretariat and Expert Advisory Group.

2.5 Governance of the Assembly

2.5.1 Guiding Principles of the Assembly

At its first meeting in May 2022 the members of the Citizens' Assembly adopted a set of six guiding principles, intended to provide a values-based approach to the deliberative process of the Assembly and based on previous Citizens' Assemblies held in Ireland.

The six principles are stated as follows:

Openness:

This Assembly will operate with complete transparency with all plenary meetings being streamlined live at www.citizensassembly.ie and all documentation, including submissions, freely available on the website. The Assembly is open to hearing from all sections of society on any issue associated with our remit, including our diaspora and young people under 18 years of age, who are not directly represented in the Assembly membership;

Fairness:

It is important that:

- we allow the full spectrum of views to be heard on every issue;
- our briefing material for Assembly members is of the highest quality;
- presentations by selected speakers are factual, informative, impartial and accessible.

Equality of voice amongst all Assembly members:

Each member will have the opportunity to voice their opinions and allow other members to voice theirs, with no-one dominating the discussion;

Respect:

Members will respect each other's opinions by ensuring that everyone can make contributions and express their views freely without fear of personal attacks or criticism;

Efficiency:

The Assembly will make best use of our limited time together and ensure that members are supported to the greatest extent possible, including in their preparation for meetings;

Collegiality:

Members will recognise that we are a diverse group and will endeavour to work together in a spirit of collaboration and community as we embark on this important task.

2.5.2 Steering Group

A Steering Group was formed to provide a forum for representatives of the members to engage with the Chairperson and Secretariat concerning the planning and operation of the Citizens' Assembly.

The Chairperson sought nominations for membership of the Group at the inaugural meeting and all 6 Assembly members who put themselves forward were appointed to the Group.

In advance of each meeting of the Assembly the Steering Group considered a draft programme for the meeting and had the opportunity to engage with and provide feedback to the Chairperson and Secretariat.

The Steering Group also met with the Chairperson and Secretariat at key junctures during the process to discuss governance and scheduling issues, particularly in relation to the balloting process.

Members of the Steering Group were:

- Sheelagh Brady
- Ruairi Breslin
- Anca Cerbu
- Louise Conlon
- Dan O'Dwyer
- Jenny Santiago-Young

2.5.3 Expert Advisory Group (EAG)

As provided for in the Oireachtas Resolution, the Chair established an Expert Advisory Group from relevant disciplines and fields to assist with its work in terms of preparing information and advice.

The EAG was constituted to provide a range of perspectives and expert opinion in relation to the work of the Citizens' Assembly.

The EAG members were:

- Professor Tasman Crowe, Director of the Earth Institute, UCD and Chair of the National Biodiversity Forum
- Dr Mary Dobbs, Associate Professor at the Department of Law at Maynooth University, specialising in environmental law and governance
- Dr Micheál Ó Cinnéide, former Director of the Environmental Protection Agency, and former Director of Marine Environment and Food Safety at the Marine Institute
- Professor Jennifer McElwain, Chair of Botany, TCD
- Dr James Moran, Senior Lecturer in Ecology and Biology, ATU, and project lead on the Agro-ecology and Rural Development Research Group
- Professor Ian Montgomery, Emeritus Professor of Animal Ecology, School of Biological Sciences, QUB
- Dr Clodagh Harris, Senior Lecturer at the Department of Government and Politics, UCC and an affiliate of the Environmental Research Institute

The EAG met formally on 10 occasions between May 2022 and January 2023 and collaborated regularly throughout that time via email. They attended meetings of the Assembly and provided valuable advice and input between and during meetings.

2.5.4 Rules and Procedures

The following rules and procedures were agreed at the inaugural meeting, with a small number of changes agreed during the course of the Assembly's work programme.

Timing and frequency of meetings

Meetings of the Assembly will generally take place in designated venues in the Dublin area during 2022. Full details of the proposed dates for these meetings will be supplied to members and will be available on www.citizensassembly.ie.

Attendance of meetings

It is very important that members are available to attend all weekends to ensure all citizens have the same information and can participate in the discussions which will influence the final conclusions of the Assembly. Because of this, a member who misses more than one weekend meeting will have to leave the process, unless there are extenuating circumstances. A panel of substitutes will be selected who may replace members who have to leave the process.

Table 6: Attendance at Meetings as a Percentage of Assembly Membership

Date	Attendance
14 May 2022	76%
11 June (Fieldtrip) 2022	69%
24-25 September 2022	86%
15-16 October 2022	87%
5-6 November 2022	93%
26-27 November 2022	100%
21 January 2023	80%

Use of mobile devices

Assembly members are asked not to use mobile devices during roundtable discussions but are encouraged to take photographs and post on social media.

Transparency of meetings

Members of the public will not have access to the meeting venue but will be able to view the plenary sessions streamed live at www.citizensassembly.ie. Round-table discussions will not be live streamed.

Press, communications and members' interaction with the media

Accredited members of the media shall be permitted to attend plenary sessions of the Assembly, subject to such terms and conditions as may be laid down by the Assembly. Members of the media will not have access to private sessions of the Assembly.

As a general principle, the Chairperson shall act

as spokesperson in relation to administrative or procedural matters.

Unless requested by or agreed with the Chairperson, members shall refrain from media interviews or public commentary while the Assembly is actively considering a topic. This shall also apply in respect of social media sites.

Protection of members' privacy

To ensure the privacy of members, personal details (including names) will be treated in strictest confidence. Any individual or organisation which attempts to contact a member to try to influence their views on a particular topic will be automatically excluded from taking part in the Assembly.

Speaking arrangements

The format and structure of speaking arrangements shall be agreed in advance and, as a general principle, all contributions by members should be brief, respectful and non-repetitive. Any member wishing to speak should indicate this to their Facilitator, who will inform the Chairperson. In an effort to make most efficient use of time in plenary session, members are encouraged to use the opportunity of roundtable discussions to express their views, ask for factual information if required and deliberate with one another.

Tabling and circulation of papers

All documents for Assembly meetings shall be made available to all Members of the Assembly via e-mail. Alternative arrangements will be made for those members who are not in a position to receive e-mail.

Voting

Votes, if required, shall be by secret ballot of the members present. Votes shall be overseen by the Chairperson, with the support of at least two Members of the Assembly. The Chairperson will only vote in the event of a tied vote.

Note: A large number of decisions on the wording and passing of recommendations were reached by a majority show of hands during plenary sessions.

Assembly members agreed to move the final voting of remaining recommendations to online to facilitate those who were not in a position to attend the additional, unscheduled meeting in January 2023.

98% of members participated in the online voting during the week of January 23rd – 30th.

Accessibility of services and information for persons with disabilities

In line with the provisions in the Disability Act 2005 and the Code of Practice on Accessibility of Public Services and Information Provided by Public Bodies, the Assembly will ensure that services and information will be accessible to all members including those with a disability in so far as is practicable and appropriate.

It is noted that all Assembly members will be selected at random to represent the views of the people of Ireland and will be broadly representative of society as reflected in the Census.

Irish sign language translation will be provided for all plenary sessions of each meeting.

Observers

It is recognised that certain organisations / individuals such as advocacy groups, NGOs, academics political parties, researchers and social partners may have a legitimate interest in being present at the meetings to observe proceedings first-hand. However, there is limited space for observers. Attendance will be for plenary sessions only and will be subject to an application process governed by the Secretariat.

Review of procedures

The Chairperson shall consult with Members of the Assembly and other interested parties and conduct such reviews of the procedures and administration of the Assembly as she sees fit.

Early warning

Members are encouraged to signal any concerns or difficulties to the Secretariat as early as possible so they can be resolved quickly.

2.6 Evaluation of the Assembly Process

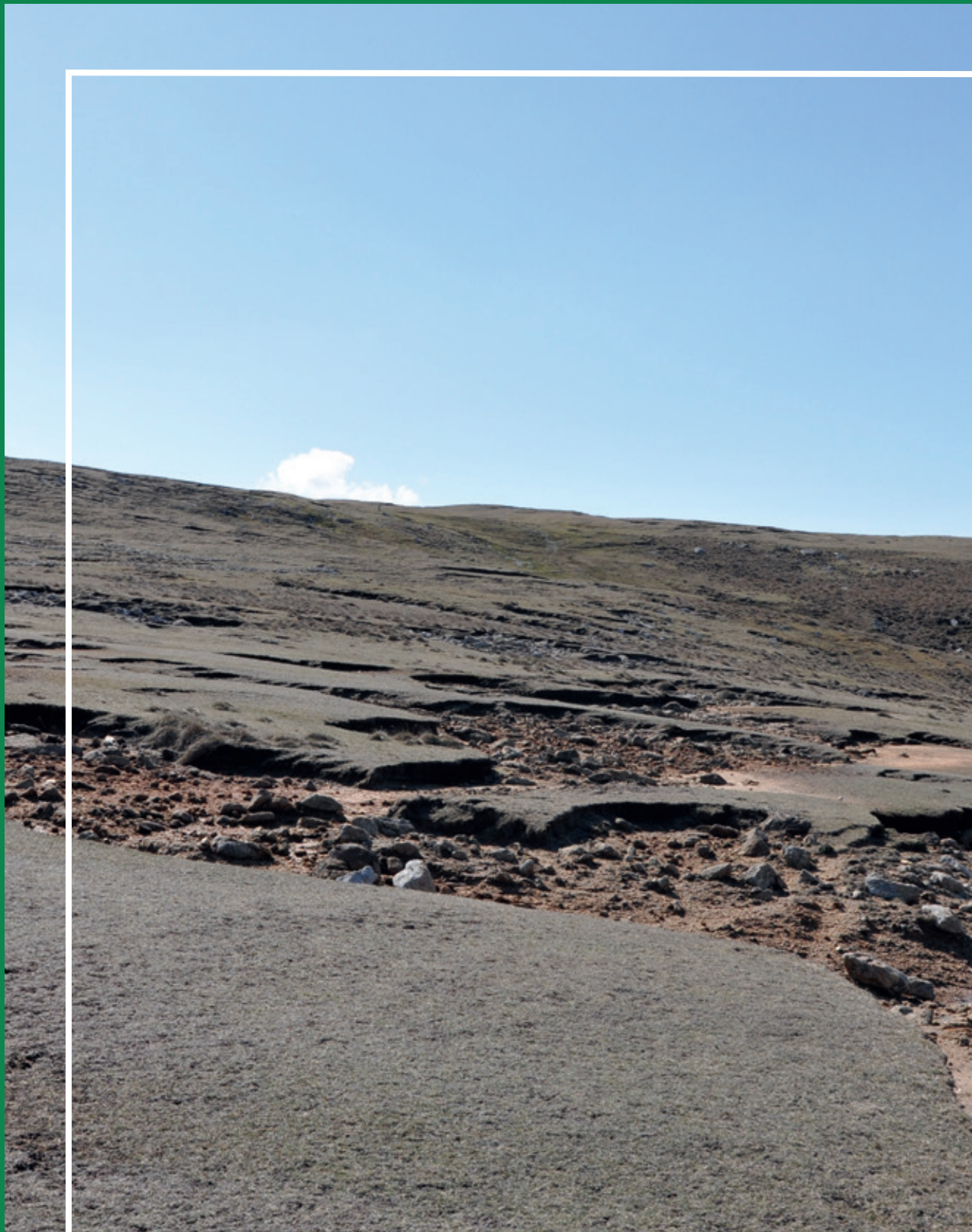
The Assembly members and secretariat were very grateful for the advice and support of Dr Clodagh Harris, University College Cork, a renowned expert in deliberative democracy, during the design, planning and implementation phases of the Assembly process.

Following the submission of this report to the Houses of the Oireachtas, an independent expert, external to the process, will conduct a separate evaluation of the work of the Assembly in its entirety.

Members of the Assembly were surveyed at every meeting in relation to information content, the work programme, facilitation of roundtable discussions, the process, etc. The results of these surveys will be analysed and published as part of the evaluation.

3

The Programme



3.1 Programme Design and Innovations

When the Citizens' Assembly on Biodiversity Loss was established, it was provided with comprehensive Terms of Reference. These required members to develop, over a short timeframe, a broad, deep and coherent understanding of the issues around biodiversity loss. This was no easy task given that the biodiversity emergency has both global and Irish perspectives and is a complex, multifaceted issue that spans all sectors of the economy and society. In addition, addressing the issue of biodiversity loss involves multiple actors across the government system, NGOs, communities and individuals.

The complexity and multifaceted nature of the situation presented a challenge to the Chair, Expert Advisory Group and the Secretariat in considering the structure and content of the programme, as well as potential speakers. The objective was to deliver a balanced, evidence-based and unbiased programme that would allow the members to make informed and focused recommendations to the Oireachtas on how to address biodiversity loss.

There were a number of innovations in the design of the programme of work introduced during this Assembly.

Fieldtrip

Members went on a fieldtrip to three biodiversity sites in the Dublin area - the first time a Citizens' Assembly had undertaken work outside of a specified meeting room. While such an outing might not suit all subject matters, in this instance it provided first-hand experience of biodiversity and gave the members an insight into the practical issues involved in managing biodiversity. In addition, it provided a unique, relaxed and immersive environment in which members could get to know each other.



Sectoral Approach

The Assembly agreed that it would generally follow a sectoral or landscape approach to considering biodiversity loss in the context of the Terms of Reference. The benefit of this approach was that it allowed members to consider the very large issue of biodiversity within a conceptual framework. Members may have already been intuitively familiar with this framework, given that much of existing policy is already structured on it. Within this structure it was also agreed that other holistic and strategic perspectives would be included.

The sectors were:

- Protected Sites and Species
- Agriculture
- Forestry and Woodlands
- Peatlands
- Freshwater
- Marine and Coastal environments
- Urban and Built Environments

There were also sessions on:

- Environmental Rights
- Invasive Species
- Industry
- Energy Production
- Biodiversity Education

While climate change is a major driver of biodiversity loss, the Assembly agreed that as this was the subject of a previous national Citizens' Assembly in 2018 it would not be addressed in detail in this programme.

The approach to each sector generally followed the same format. Each began with an introductory high-level overview. This was followed by practitioners in each area speaking on various issues and responses, including international perspectives.

Voices from the Sector

A key feature of the overall programme was the introduction of what became known as the 'Voices' section. This provided opportunities for representatives of various groups and stakeholders to present to and speak with members. Each speaker was asked to present for five minutes, to be on hand to answer questions during the round table discussions, and to participate in a formal question and answer session.

These 'Voices' provided for diverse, disparate perspectives, while also adding to the depth of knowledge of the Assembly. These voices included farmers, community groups, anglers, environmental NGOs, financial services experts and more. Over 30 of these voices were featured in the Assembly and, while each was allotted a limited time, their contributions significantly informed the member's final recommendations.



Videos from the community

There were two videos specifically produced for the Assembly. These provided a change of pace for the members and allowed for a lot of information to be presented by a variety of people in a short period of time. These are available to view on the Citizens' Assembly website⁷.

Cultural interludes

Throughout the meetings of the Assembly, cultural interludes were chosen to complement the work of the Assembly and allow for some light relief away from concentrating on presentations and discussions. These included short traditional music performances, a presentation on the deep connection between the Irish language, mythology and nature, and a presentation on the historical connections between societal norms and nature in Brehon Law.

⁷ https://www.youtube.com/watch?v=IBYLrZ9-7PA&ab_channel=Citizens%27Assembly

Contribution of Speakers

The scale of the subject matter and the Terms of Reference meant that the Biodiversity Assembly heard from many different speakers. In fact, during the course of the Assembly there were 87 speakers representing a wide variety of sectors and organisations:



Table 7: Profile of Speakers

23 from Non-Governmental Organisations

16 from Agriculture and Business

11 from State/Government agencies

10 speakers from universities

9 individuals

8 talks by members of the Expert Advisory Group

6 Members of the Children and Young Persons' Assembly on Biodiversity

4 from Local Authorities

3.2 Programme Outline and Overview

The Irish Citizens' Assembly deliberative process involves the provision to members of:

- Information from academics, stakeholders and public submissions.
- Small group conversations, in the form of roundtable discussions, where members draw from their own knowledge and experiences, reflect on the information they have been presented with, listen to fellow members and work together to draft questions, consider responses and suggested solutions. A facilitator and note-taker are at each table to record all of the conversations.
- Question and answer sessions with presenters, based on members' roundtable discussions.

Over the course of the Assembly there were 12 hours 50 minutes of presentations, 21 hours and 30 minutes of round table deliberations, 5 hours and 50 minutes of questions and answer sessions, 9 hours of plenary sessions and a 6 hours and 30 minute filedtrip.

Recommendations were drafted from the notes recorded from each table at each meeting. Based on a proportional representation of ideas, these draft recommendations were refined, edited and re-drafted by members until there was a consensus on wording of recommendations to be voted on. Members also had the opportunity to propose other recommendations at various stages of the process.



The following section provides a general outline of the Assembly's programme. Sections 4-9 provides summaries of the Assembly meetings, providing a more detailed breakdown of the meeting.

All presentations are available for viewing on the Citizens' Assembly website⁸ and provide a record of the information provided at the Assembly meetings, in addition to all question-and-answer sessions with speakers.

Given the nature of the subject, it should be noted there were many cross-cutting and overlapping issues that were referenced or discussed on a number of different occasions by multiple speakers. For instance, by simply looking at the presentations in the Agriculture section you would not get a full appreciation of the information that the members deliberated on, as agricultural issues featured in other sectors (e.g. freshwater, forestry and woodlands, enforcement etc.)

It should also be noted that many of the issues that led to overarching recommendations were often based on information that was presented by more than one speaker and across sectors.

⁸ <https://www.citizensassembly.ie/en/assembly-on-biodiversity-loss/meetings/>

3.3 Inaugural Meeting of the Citizens' Assemblies

There was an 'Inaugural Meeting of the Citizens' Assemblies' for both Biodiversity Loss and a Directly Elected Mayor for Dublin, which was live streamed from Dublin Castle on 9 April 2022. The meeting included an address from Taoiseach Micheál Martin, T.D., a short address from the two Chairs, Dr Aoibhinn Ní Shúilleabháin and Jim Gavin, and a talk by Dr Clodagh Harris, UCC, on "What is deliberative democracy and why is it important".



3.4 First Meeting 14 May 2022

The first 'in person' meeting of the Assembly introduced members to the general subject of biodiversity and biodiversity loss. It provided an outline of the causes of the problem on a global scale and informed members about Ireland's terrestrial and marine biodiversity. It also addressed the issues of why biodiversity is important both on a general and societal level as well as a personal one.



3.5 Fieldtrip 11 June 2022

“I had already appreciated that biodiversity is incredibly important. But the Citizens’ Assembly Fieldtrip was both inspiring and informative, and left me feeling I wanted to learn all I can about the problem, so that I can be part of the solution.”



“There are a lot of good independent initiatives out there, but there appears to be little in the way of joined-up thinking, cross organisation information sharing or clarity about overall responsibility and not enough qualified people being employed nationwide.”

“Protecting and enhancing biodiversity is key in any environment, including in business and industrial spaces. No matter what the context, there must be a place for biodiversity. It needs a partnership approach between business and science, between corporate leadership and environmental organisations.”



“Turvey is a beautiful public amenity that shows what can be done with a relatively small investment and a partnership between the local community, environmental agencies and local authorities. Nature can recover quickly once you let it. But it’s not enough to identify the problem and say things need to be done - someone to take responsibility for managing biodiversity.”

“Bull Island is an amazing facility in the heart of our Capital City, and we need to protect it. It gives a fascinating picture of the interdependence between nature and humankind, and how strategic interventions can work to enhance biodiversity. Everything around us has value if we stop to look and appreciate.”



Quotes from members’ feedback on the field trip, 11 June 2022. The fieldtrip involved visits to three different biodiversity sites looking at the approaches to managing biodiversity in a public park (Turvey Nature Reserve), a protected site (North Bull Island) and an industrial landscape (Dublin Port).

3.6 Second Meeting 24-25 September 2022

This was the first of the substantive meetings, which took place over the course of two days. This meeting further developed the members' understanding of biodiversity concepts and the causes of biodiversity decline, including climate change. Information was provided to members about our EU and international obligations, as well as how biodiversity is managed in Ireland.

Members were given an overview of Ireland's protected sites and species and the practical side of implementing, monitoring and enforcing biodiversity legislation and policies. Given that the members' recommendations were likely to have some fiscal impact, they were provided with contrasting perspectives on national/governmental economics.



3.7 Third Meeting 15-16 October 2022

This was the first sectoral meeting, which covered Agriculture, Forestry and Woodlands, and Peatlands. As it involved people's relationship with the land, it began with an historical perspective on Brehon Law and the traditional relationships people have had with the land.

The first and most substantive sector considered by the Assembly was Agriculture Landscapes. As agricultural activities cover three quarters of the land mass of Ireland, it was allocated the largest amount of time. It began with a general introduction to agriculture and biodiversity and an outline of current policies, programmes and practices. This was followed by two 'Voices' sections. These were made up by nominees of 8 farming organisations. Each was allotted the same amount of time to present on what they are doing for biodiversity and what challenges they face in considering this issue. Following this section, an international speaker outlined a picture of global agriculture and biodiversity and Ireland's position in this. Subsequently, the members listened to a case study of how to engage with and motivate farmers to reverse biodiversity loss.

The Woodlands and Forestry section began with an overview of the national situation and presentations by the state body responsible for forestry. This was followed by a video that looked at three contrasting experiences and perspectives – a rewilding project, a Sitka spruce plantation owner and an urban forest. The people featured in the video were also present to speak to the members and answer questions.

The final sector was Peatlands, which consisted of an overview of peatlands and biodiversity and voices from the peatland stakeholders' community. An organisation representing people wishing to continue turf-cutting were approached and encouraged, through ongoing conversations,

to present to the Assembly, but they declined. Recognising the need to ensure diverse perspectives were included in the discussions, one of the speaker in the ‘Voices’ section, a former turf cutter, was permitted additional time to broaden the members understanding of this issue.

Given the members’ articulated interest in and questions around the issue of environmental rights, as well as the content of a number of submissions received by the Assembly, there was a presentation on Environmental Justice and Rights of Nature.



3.8 Fourth Meeting 5-6 November 2022

The second sectoral meeting discussed Freshwater, Marine and Coastal Environments and Urban and Built Environments.

The Freshwater section began with a presentation on water quality and biodiversity pressure in Ireland’s freshwaters (rivers, lakes, etc.). This was followed by two presentations on issues and challenges in freshwater catchments and local catchment assessment in Ireland, with potential actions to reverse decline. There was then a ‘Voices’ section, with four speakers giving varied perspectives on the condition and management of Ireland’s freshwater.

This was followed by talks on freshwater and other invasive species and how to protect and restore freshwater fish.

The Marine and Coastal Environment section followed a similar format, with a high-level overview, a scientific perspective on biodiversity in our ocean and a three-person ‘Voices’ section.

This meeting also included a section on Energy Production, which looked at both the positive impact on biodiversity of renewable energy on land and sea and the potential conflicts arising from renewable energy projects in sensitive biodiversity areas.



The final section of the meeting focused on the Urban and Built Environment. This section comprised of a high-level overview, a talk on nature-based solutions in urban environments, and a presentation about the Dutch city of Utrecht and its projects and plans to incorporate biodiversity in an urban environment. A 'Voices' section was also included on this sector.

There were two other presentations at this meeting. Six members of the Children and Young People's Assembly on Biodiversity Loss, which was held separately to and independent of this national Citizens' Assembly, presented their recommendations and outlined their experiences. The members also heard a cultural presentation on the Irish language, mythology and sustainable living.

3.9 Fifth Meeting 26-27 November 2022

The first part of this meeting concluded the programme of the Assembly. It began with a reminder of the value and importance of biodiversity. This was followed by a session on industry and biodiversity, which began with an outline of what industry is currently doing and how they can better engage with biodiversity. In the 'Voices' section there were four contributors from finance, food, tourism and business.

There was a presentation on the current status of and potential for biodiversity in the education system.

Similar to the way it began, the Assembly's programme ended with an international speaker looking at the global issue of biodiversity and at the role that individuals can play in addressing the Biodiversity Crisis.

This completed the programme of speakers for the Citizens' Assembly on Biodiversity Loss.

Members began deliberating on the entirety of recommendations to come from the Assembly. As there was not sufficient time to thoroughly discuss all draft recommendations within this meeting, members voted to hold an additional, unscheduled meeting during January 2023.



3.10 Sixth Meeting 21 January 2023

This meeting acted as a continuation of the fifth meeting, where members continued their deliberations and discussions of the recommendations. The meeting focused on recommendations that had not been discussed and re-drafted as an Assembly.

Prior to this meeting, members had agreed that voting on the finalised wording would take place by secret ballot online, similar to the process undertaken with the Citizens' Assembly on Gender Equality. Once finalised wording had been agreed, this formed the bases of the e-voting which members, excluding the Chair, voted on (98% participation), during 23 - 30 January 2023.



Part II: Summary of Assembly Meetings Content

4

Summary Content of Meeting 1: 14 May 2022



The following is a summary of the meeting held on the 14 May 2022; a video record of the meeting, including presentations, plenary sessions and Q&A, is available on the Assembly's website at:

<https://citizensassembly.ie/citizens-assembly-on-biodiversity-loss/meetings/14th-may-2022/>

4.1 Biodiversity: What it is, why we should care and how we should respond

Sir Robert Watson

The meeting began with a video talk by Sir Robert Watson, former chair of Intergovernmental Panel on Climate Change, former Chair of the Intergovernmental Platform on Biodiversity and Ecosystem Services and co-chair of two United Kingdom Assessments on Biodiversity.

Prof. Watson outlined the global biodiversity perspective, the provisioning services provided by biodiversity i.e. food, water, energy, regulation of climate and water, control of pollution, as well as aesthetic values. He outlined the scale of the reconfiguration of the biosphere by human activities, with humans having transformed 75% of the ice-free land mass and disturbed 66% of the Earth's oceans while 85% of wetlands and peatlands have been lost. By 2050, it is projected that only 10% of the earth will be in a near natural state and in the next 100-150 years, 13% of all species will be threatened with extinction.

He outlined the five main drivers of this biodiversity loss:

1. Land use change – particularly caused by agriculture
2. Exploitation of our ecosystems
3. Pollution
4. Invasive/Alien species
5. Climate Change

Prof. Watson stated that, currently, the main drivers of biodiversity decline are land use change and exploitation. Climate change could become the main driver of biodiversity loss in the coming decades if sufficient action is not taken. Climate and biodiversity are strongly coupled and need to be dealt with together.



Prof. Watson outlined that both climate change and biodiversity loss are not simply environmental issues, they are also developmental ones affecting food, energy and water security, as well as human health. It is also an equity issue, as the consequences of biodiversity loss are not equally shared. Biodiversity has 'non-market value' in regulating climate change, pollution and flood control. The loss of biodiversity means less food, less clean water.

Prof. Watson also stated that the loss of biodiversity is also a moral issue. He asked: 'Do we humans have the right to destroy nature?'

He stated that addressing the drivers of biodiversity loss requires government, private

sector, financial services sector and the general public working together to transform economic, financial and productive systems. We need to take the value of nature into account when measuring sustainability. Many governments currently subsidise unsustainable agriculture, mining, forestry and fishing. We need to use that money to subsidise sustainable practices.

Prof. Watson concluded by stating that biodiversity is central to human well-being, but we are destroying it and, therefore, undermining our own future.



4.2 Introduction to Biodiversity in Ireland

This is Ireland Video, produced by Across the Line

The members were shown a three-minute video illustrating Ireland's diverse and beautiful wildlife⁹.

4.3 Ireland's Land Biodiversity

Dr Ferdia Marnell, Head of Animal Ecology, National Parks and Wildlife Service

Dr Marnell gave a high-level sweeping account of Ireland's diverse land biodiversity.

He began by telling the members that Ireland's biodiversity is a unique product of our geography, history and climate. There's no other country with the same biodiversity as Ireland and it comprises around 30,000 individual species.

Dr Marnell told the members that 2,000 years ago much of Ireland was covered in native forest. However, when humans arrived it began to change. Today 65% of our landscape is agricultural and 10% intensive forestry. Therefore, 75% of our landscape is relatively intensively managed. Most of our biodiversity is in the other 25%.

Dr Marnell gave an outline of the many species associated with 5 types of habitats that make up most of that 25%. These are peatlands, natural woodlands, limestone pavements and turloughs, and freshwater and coastal landscapes.



⁹ <https://www.youtube.com/watch?v=Rk8VibKA4Ws>

4.4 Ireland's Marine Biodiversity

Prof. Tasman Crowe, University College Dublin (member of the EAG)

Prof. Crowe told the members that many people do not think of the marine environment when thinking about Ireland. However, Ireland is an island nation with 90% of its territory being underwater. The maritime area of Ireland is 7-10 times more extensive than the land area (depending on the measuring criteria). It extends from the shore to the ocean, which reaches 4.5km in depth and is fully interconnected with the seas around us. Prof. Crowe told the members that our marine biodiversity, which exists largely out of sight in our seas, has more different kinds of species than our terrestrial environment.

Prof. Crowe outlined Ireland's marine biodiversity from phytoplankton, tiny animal species, seaweed, invertebrates, to 400 different species of fish, sharks, whales and a wide variety of seabirds.



4.5 What does Biodiversity do for us in Ireland?

Prof. Jane Stout, Professor in Botany, TCD

Prof. Stout began by providing some context for the members. She explained that most of the diversity of life on earth precedes humans. If the whole of history of life was condensed into 24-hour clock, humans would arrive at 2 minutes to midnight. However, humanity has had a massive impact on biodiversity.

She told members that the breakdown in the relationship between humanity and the natural world puts us at risk. It is important that when discussing biodiversity to remember it is not all about us. Biodiversity also has intrinsic value.

Prof. Stout addressed the members on a number of key areas telling members:

- Biodiversity is fundamental to human existence. It is our life support system, which allows us to survive by protecting us from the elements and provide food and water. Biodiversity is essentially regulating our environment. For example, bogs regulate water and climate, store carbon, provide valuable habitats, and maintain healthy soils to produce crops. This in turn supports pollinators in the production of fruits and vegetables, as well as regulating the water cycle.
- Biodiversity provides direct and indirect contribution to human health. Biodiversity provides us with medicines and medical cures for diseases. Biodiversity is also important to our well-being and mental health.
- Biodiversity provides goods and services on which we depend. We are part of nature and it is fundamental to us.
- To some people biodiversity is sacred and has a moral worth. Many others care about the creatures and ecosystems with which we share our planet.



4.6 Look at Nature Around You

Ella McSweeney, Broadcaster, RTÉ

Ms McSweeney spoke to the members about people's individual relationships with nature and the importance of these relationships.

She told the members that biodiversity is the life around us, the life with which we share this island. She reminded members to think about the life we have lost and the life that needs our help. Older people have a sense of a much higher nature baseline than we do today. Where has the life gone? Nature is slipping away from us at an alarming rate.

Ms McSweeney encouraged members to notice the nature around them, to engage with nature, to create a nature table in their minds. When one notices nature, it is almost impossible not to feel emotions.

Her talk was illustrated and provided with audio giving a number of examples of transformative personal experiences with nature: a murmuration of starlings, hearing the voices of hump backed whales, creating new habitat for the curlew (a species which has declined 98% in Ireland in the last 30 years) and swifts (which have declined by 40% in the last 15 years).

She concluded her talk by telling members that humans have garnered a disproportionate amount of power and need to hear the call of nature. We are lucky that nature is so resilient. But we must open our arms in welcome to nature before it is too late.

5

Fieldtrip: 11 June 2022



The field trip consisted of visits to three sites in the Dublin area where biodiversity is being managed in very different environments.



5.1 Turvey Nature Park

Kevin Halpenny, Senior Parks Superintendent, and Hans Visser, Biodiversity Officer, Fingal County Council.

Mr Halpenny and Mr Visser introduced members to the role that a local authority plays in biodiversity conservation.

Members were told that Turvey Park is owned by Fingal County Council and forms part of the Council's Green Infrastructure. The park is planned and managed as a nature park and includes natural and semi-natural areas and other green spaces - both terrestrial and coastal marine. There are other areas that have been identified as potential sites for further enhancement of biodiversity.

The council is assembling open spaces over time to form integrated green infrastructure linking various habitats to form a nature network. Their draft development plan seeks to achieve "multi-functionality" through active buy-in of the various vested interest sectors i.e. those involved in agricultural production, planning for housing, etc.

They stated that the national scale of biodiversity expenditure should be a lot more than current levels and highlighted that Mr Visser was the only Biodiversity Officer in Fingal County Council.

The members were shown reclaimed wetlands and other interventions that support biodiversity.

5.2 Dublin Port

Eamonn O'Reilly, Chief Executive, Eamon McElroy, Port Engineer and Lar Joye, Heritage Officer.

Dublin Port is Ireland's largest port, one of the most heavily industrialised sites in the city and also an important area for nature. It is a Natura 2000 site and management told members that they take that role very seriously.

The Dublin Port Masterplan assesses the capacity of the Port to handle the level of traffic envisaged into the long-term future and an integral part of the plan is to address impacts on nature.

Members were told that the availability of adaptive civil engineering expertise was helpful to devising of nature conservation measures, as per Dublin Port's construction of customised pontoons to protect the bird tern colony in co-operation with BirdWatch Ireland. Dublin Port has recently started bird conservation projects to inform how best they can sensitively redevelop its seawalls and minimise impact on nature in the future. The necessity for a robust research base was highlighted as an essential pre-requisite and the importance of scientific measurement was emphasised. Dublin Port has been building collaborations with research institutions on how to deploy nature to mutual benefit, such as in the devising of specialist wall tiles suitable to provide a habitat for water-cleansing limpets.

Every project has to be thoroughly examined from an environmental point of view, in tandem with Dublin Port's economic remits. Members were told that they take their nature conservation work seriously, not because they have to but because they want to. Members were driven and walked through part of the port during which they were shown features of the port and engaged in questions and answers with staff.

5.3 North Bull Island

Aoife Delaney, NPWS Coastal and Monitoring Expert, Dr Rebecca Jeffrey, NPWS Science and Biodiversity Unit, and Sinead Delaney, NPWS Birds Expert.

North Bull Island is owned by Dublin City Council. It is an internationally important designated site and part of the Natura 2000 network. The staff of the National Parks and Wildlife Service began the visit with an outline of the administrative structure of the NPWS and an introduction to its role regarding the national network of protected sites and species designated under the Birds and Habitats Directives, which are collectively known as the Natura 2000 Network.

The habitat at Bull Island is part of a series of interlinking habitats stretching all the way to Dundalk in the north, to the Dublin Mountains in the south and includes all of Dublin Bay. Members were told about the importance of sand dunes for ecosystem services, including acting as protective barriers to flooding for nearby residences. Preventive measures to protect the sand dunes are essential, but there is an ongoing challenge of educating the public as to their conservation importance. Sand dunes are home to over 1,000 vascular plants and about 350 of these can be found at Bull Island. Invasive plants are, however, bringing unwelcome stability to sand dunes and need eradication.

At the end of the visit the members were brought to the more sheltered inter-tidal areas of the salt marsh, which provides a safe foraging site for winter wading foraging birds. A threat to this vital food source comes from humans who are exploiting the same food source. Salt marshes are important carbon sinks and this dimension gives extra reason for such sites to be especially well managed.





6

Summary Content of Meeting 2: 24-25 September 2022



The following is a summary of the meeting held on the weekend of 24-25 September 2022; a video record of the meeting, including presentations, plenary sessions and Q&A, is available on the Assembly's website at:

<https://citizensassembly.ie/citizens-assembly-on-biodiversity-loss/meetings/24th-25th-september-2022/>

6.1 How to be a Good Ancestor

Dr Roman Krznaric, Author and Public Philosopher

Dr Krznaric told members that the biodiversity emergency is a long-term issue that requires long-term thinking. Decisions made now will have impacts for generations to come. How can we be good ancestors for those generations?



Dr Krznaric cited long term thinkers who built cathedrals, the members of the Future Design movement in Japan and the seventh generation thinking of Iroquois native Americans as practical examples of long-term thinking.

He carried out a thought exercise with members to demonstrate the impact of long-term thinking and to have them think about the kind of legacy we want to leave.

6.2 Video showing the work of the Children and Young People's Assembly on Biodiversity Loss

In September 2022, Ireland held its first Children and Young People's Assembly on Biodiversity Loss¹⁰. Members of this Assembly would attend a later meeting of the Citizens' Assembly to present their recommendations.

¹⁰ <https://www.citizensassembly.ie/en/assembly-on-biodiversity-loss/meetings/>

6.3 Biodiversity Loss in Ireland

6.3.1 Ecology – A Brief Introduction to Ecological Concepts and Main Threats

Prof. Tasman Crowe, UCD, with support from Prof. Jennifer McElwaine, TCD, and Dr James Moran, ATU (all members of the EAG).

Prof. Crowe described his talk as 'Ecology 101', revisiting and expanding on the five big threats to biodiversity - habitat loss, exploitation, pollution, climate change and invasive species - and introducing ecological concepts giving context to those threats.

The loss of biodiversity is a gradual and localised. In Ireland:

- 85% of protected habitats in Ireland are in unfavourable condition.
- 20% of breeding birds in Ireland are in long decline.
- birds that overwinter in Ireland are down by 50% since 1990s.
- endemic species that are only found in Ireland are of particular concern.

Prof. Crowe explained species decline by outlining the various stages of life history and threats, using the threatened Natterjack Toad as an example. He also introduced the concept of resilience – the ability of species and habitats to withstand and recover from threats.

Prof. Crowe likened the vulnerability of ecosystems to an airplane held together by many rivets. If you lose enough rivets or key rivets, the airplane will crash. He stated that the scientific evidence is clear that that is the trajectory we

are on. Sufficient ecological knowledge exists to address the crisis, but political will and shortcomings in the design and implementation of policy limits impactful action.

6.3.2 Climate Change Policy and Biodiversity

Laura Burke, Director General, Environmental Protection Agency

Ms Burke described climate change as the defining challenge of the century. Caused by humans, it is altering ecosystems, causing species loss and mass mortality events of plants and animals around the world.

Currently, the main pressures on Ireland's protected habitats are agriculture and other land use changes such as extraction of resources, forestry, urbanisation, recreation and invasive species. By the end of the century climate change is set to become the most significant driver of biodiversity loss.

Ms Burke provided an overview of the many areas of climate change governance. Despite having all of these policies in place, the trends are going in the wrong direction. She outlined an intention-action gap, as targets are missed due to delayed actions as well as shortfalls in reporting by organising bodies.

Ms Burke outlined many co-benefits between climate change and biodiversity actions but also highlighted potential for conflict. She concluded that there is a lot happening, but delivery is still a challenge.



6.4 Biodiversity Loss: Some of the Evidence

Dr Liam Lysaght, Director National Biodiversity Data Centre.

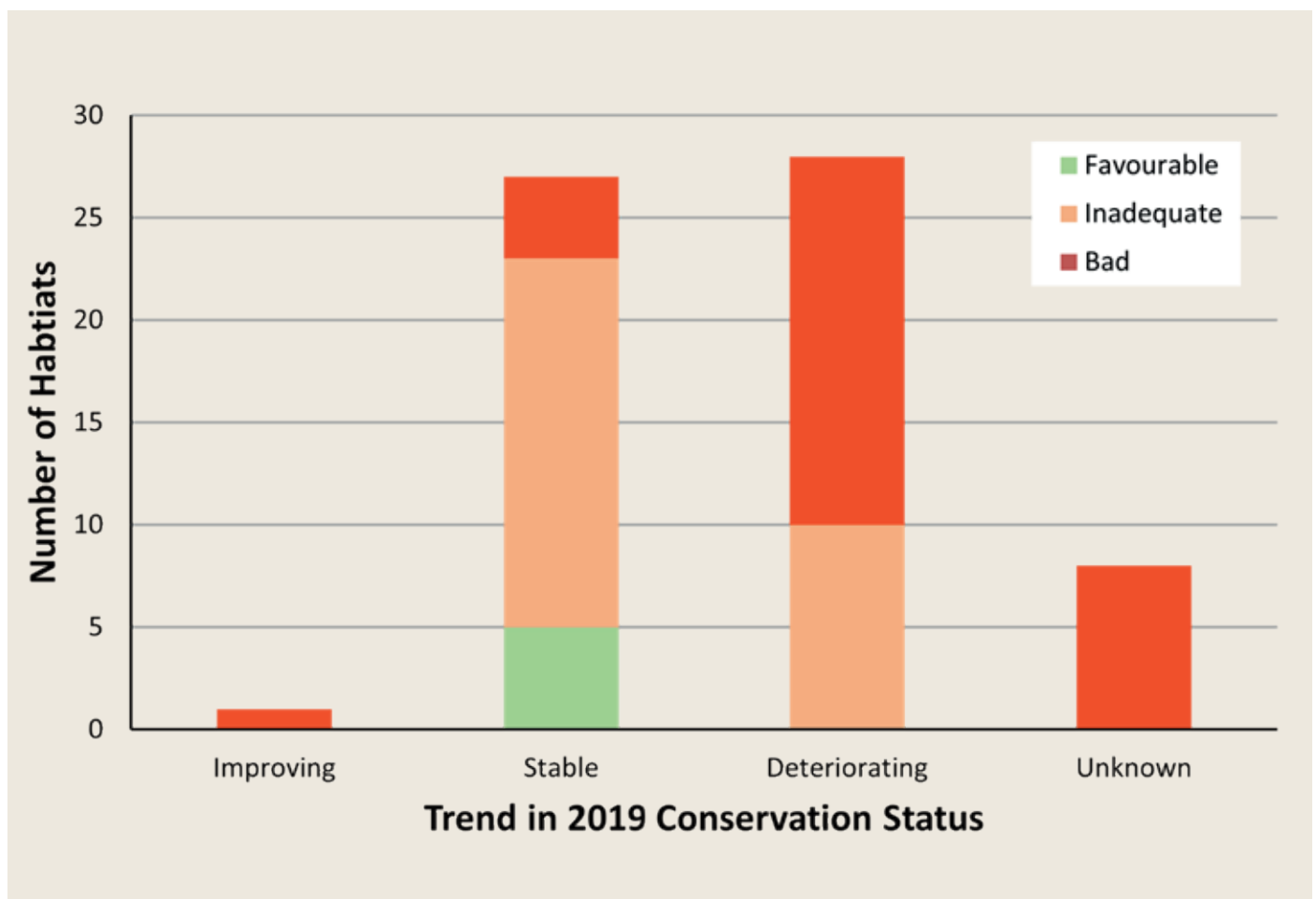
Dr Lysaght told the members that humanity is at a crossroads with regard to the legacy we are leaving to future generations. Globally we are not doing nearly enough.

In Ireland the most important measure is the Habitats Directive. However, even habitats and species afforded the strictest protection under the directive are deteriorating. 85% of the protected habitats are still in unfavourable conservation status. There is a similar trend for protected species, and he cited a number of examples.



He told the members that we do not know much about the vast majority of species, such as insects, microbes and pollinators, that support the functioning of ecosystem services. There is a serious information deficit, and we only have information about the tip of the iceberg. This is a concern.

Dr Lysaght explained that we are faced with leaving a sad legacy. Biodiversity loss is real. It is declining despite the policies in place. We should not set our ambition to retain what we have, but think about how we get back to the biodiversity that was here 100 years ago.



Examples of species we are at risk of losing

European Eel



Freshwater Pearl Mussel



Curlew



Great Yellow Bumblebee



Atlantic Salmon



Twite



6.5 Ireland's EU and International Obligations

Dr Mícheál Ó Briain

Dr Ó Briain outlined the development of international biodiversity policy. He particularly emphasised the importance of the EU Birds and Habitats Directives, which set out to restore and maintain habitats in a healthy state. These set out four pillars:

1. Ensure most valuable sites are protected as Natura 2000 sites.
2. Manage and restore land beyond Natura 2000 sites.
3. Ensure protection and sustainable use of species.
4. Ensure adequate, knowledge, data availability and awareness.

Dr Ó Briain stated that Ireland has a poor implementation record on EU nature legislation, with delays, rulings against Ireland by the Court of Justice, ongoing legal actions (particularly regarding peatlands) and one of the poorest records in designating marine protected areas.

Dr Ó Briain outlined the key measures required to implement EU legislation. He told the members that we have not reached our targets, because we have neither the mechanisms nor the human, financial and engagement commitments to deliver them. If legislation is fully implemented, we would be well on the road to recovery. He later asked members what it would mean if Ireland considered its bogs as valuable as the Book of Kells.



6.6 Mapping Biodiversity Governance in Ireland

Dr Mary Dobbs, School of Law and Criminology, NUI, Maynooth, Member of the EAG

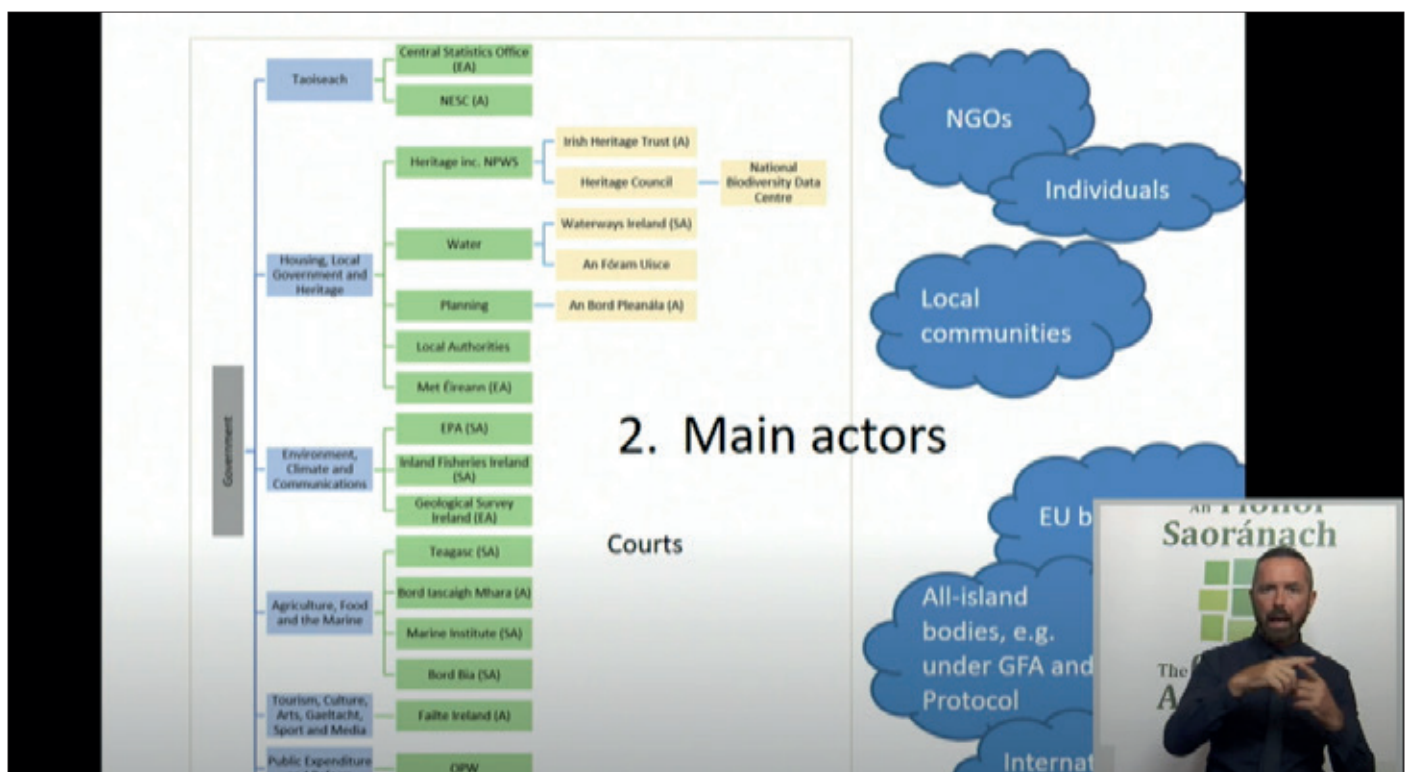
Dr Dobbs presented background information on overarching biodiversity governance in Ireland to allow members to consider potential changes. She outlined a complex and interdependent area that involves laws, policies and actors operating at national, local and individual levels.

Dr Dobbs outlined international and national biodiversity laws, as well as laws in other related fields such as agriculture, forestry, planning, fisheries, administrative law, human rights and trade.



There are 7 government departments and 23 public bodies or groups with biodiversity responsibilities. There are also NGOs, community groups and individuals. There is under-resourcing, lack of coherency, conflicts of interest and complexity.

Dr Dobbs outlined various governance tools that are available and said members could consider what approach, or combination of approaches, would work best in various areas. Alternatively, they might look at other options such as general environmental laws or environmental rights.



6.7 Communities Video

There are hundreds of different community and voluntary groups throughout the country doing work that is related to biodiversity conservation. The members were shown a 15-minute video¹¹ produced for the Assembly featuring Seán Carolan, The Old Irish Goat Society, Maria O'Connor, Friends of the Camac River, Denis Goggin, the Corrib Beo Partnership, Cormac McCarthy for the Ennis Tidy Towns Group, Alan Moore of Hedgerows Ireland and Paul Handrick of the Bee Sanctuary of Ireland. Each outlined what they are doing, why are they doing it and what are their challenges.



6.8 Ireland's Biodiversity NGOs – Irish Environmental Network (IEN)

There is a large NGO community in Ireland working in the area of biodiversity. Three members of the IEN spoke to the Assembly about their work and challenges.

Padraic Fogarty, Campaign Officer, Irish Wildlife Trust (IWT)

Irish Wildlife Trust was set up in 1979 to address the biodiversity crisis. A lot of today's problems were known in the 1970s and 1980s. Most people working in this space are volunteers. Their work is divided into education, which is essential to address the crisis, and advocacy for change. Mr Fogarty told the Assembly that the solutions are known. The IWT holds the government and state to account for the many commitments they have made on our behalf. We should increase ambition in line with the science. Mr Fogarty said the IWT have not yet succeeded in communicating with people and influencing government but will continue to do what they do until the biodiversity crisis is solved.

¹¹ https://www.youtube.com/watch?v=IBYLrZ9-7PA&ab_channel=Citizens%27Assembly

Dr Elaine McGoff, Natural Environment Officer, An Taisce

An Taisce has two main branches. The education area has ring-fenced government funding for Clean Coast, Blue Flag Beaches and Green Schools initiatives. The advocacy unit, which she talked mainly about, operates on a shoestring and gets no government funding.

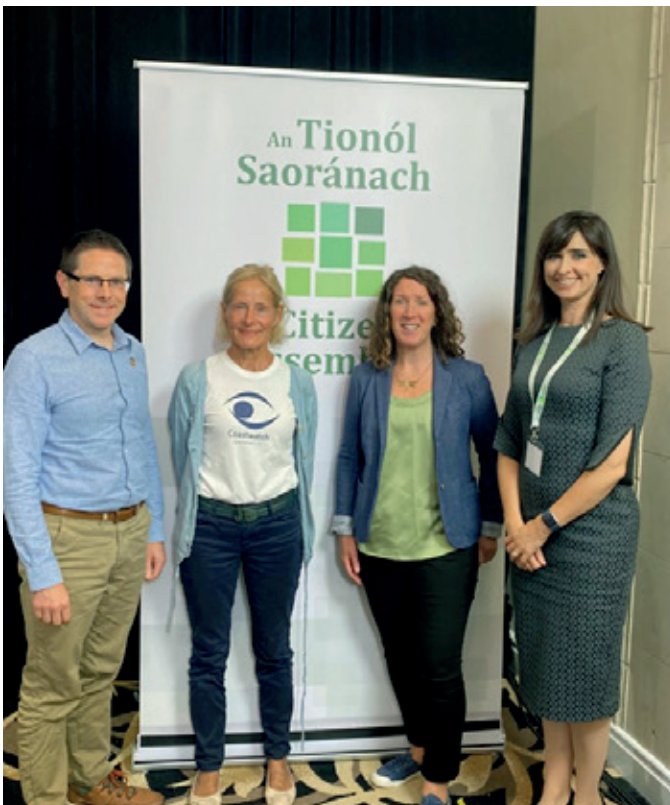
Planning is a key lever for biodiversity protection. An Taisce is the only independent environmental NGO in Ireland to have prescribed consultee status under the planning acts. She said An Taisce acts like an environmental watchdog. An Taisce are not asking the state to do anything new, just implement what they are legally obliged to. If planning, licensing and policy were in compliance with EU law, An Taisce would not be needed, and the natural world would be in a much better position. However, the State is the biggest transgressor of EU law.

The main challenge is lack of funding, with a fundamental mismatch between the expertise required and the level of funding, while NGOs are also up against very well-funded organisations with political connections.

Karin Dubsy, Co-founder and Coordinator of Coastwatch Europe

Ms Dubsy began by showing some coastal species collected in Cahore, County Wexford, and in Malahide, County Dublin.

She told the members that we cannot afford to lose more biodiversity. She described Coastwatch's education work and their core team of volunteers, scientists, lawyers and people on the ground. She said there's no way officials can look after 7,500kms of shore. All of us have a responsibility to look after it. When people know how special something is they become motivated to look after it and when they restore and protect it, it brings joy and confidence. She told the Assembly that clarity on who is responsible for what is required, because lack of clarity causes biodiversity loss. She concluded by noting the new maritime spatial planning law and urged the commencement of the parts relating to the foreshore.



6.9 Nature Designation and Protection in Ireland

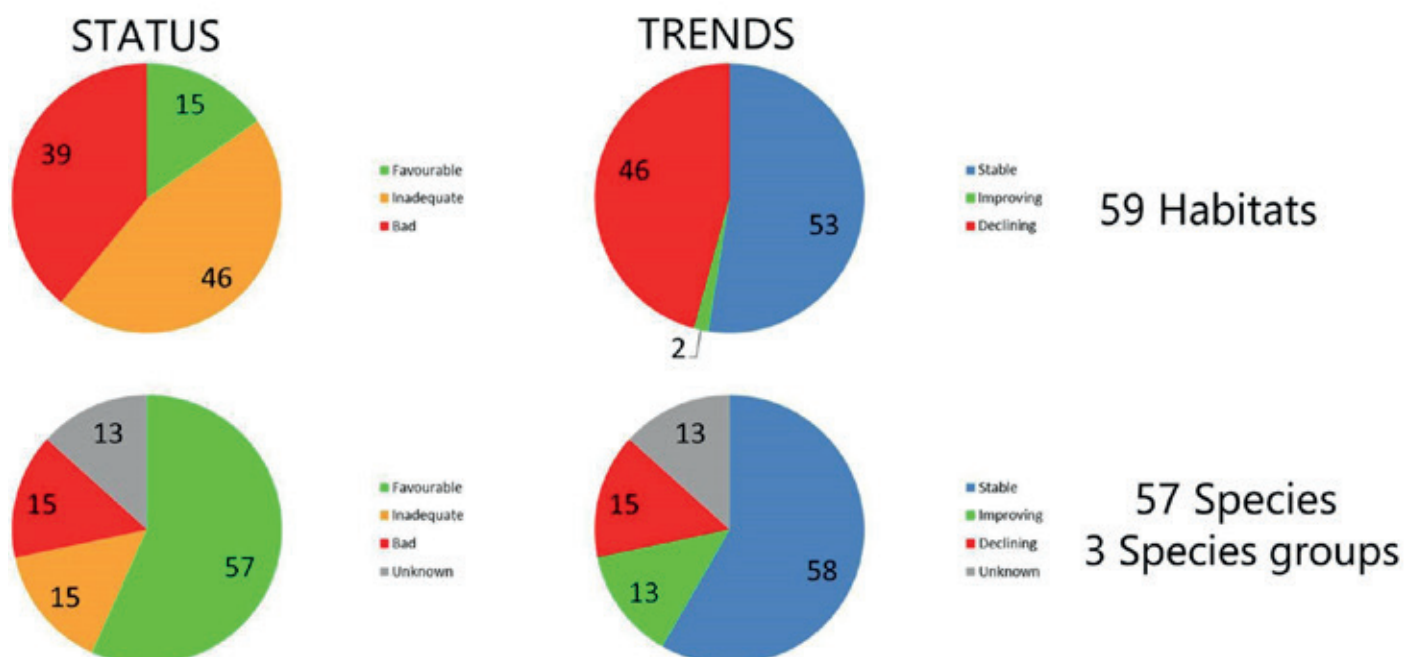
Dr Andy Bleasdale, Scientific Advice and Research, NPWS

Dr Bleasdale outlined the roles of the National Parks and Wildlife Service. Dr Bleasdale provided members with an update on the development of the 4th National Biodiversity Action Plan, the publication of which will be timed to ensure the recommendations of the Citizens' Assembly are captured.

Dr Bleasdale told the Assembly that there are two main nature designations in Ireland which form the Natura 2000 Network, covering 13% of national land area:

1. Habitats Directive - Designated best sites for protection of suites of habitats and species as Special Areas of Conservation (SAC). There are 439 SACs in Ireland for 59 habitats and 29 species. The objective of the NPWS is to maintain and restore conservation status as well as monitor and report to the European Commission.
2. Birds Directive – All birds require protection and the NPWS designate Special Protection Areas (SPAs) for birds. There are 154 SPAs in Ireland.

Conservation status assessment of EU protected Habitats and Species 2013-2018



Dr Bleasdale explained the process by which the NPWS reports to Europe, highlighting pressures and threats to the protected sites and species. He told the Assembly that these reports should prompt action by the State, but sometimes this can be missing.

Dr Bleasdale provided members with some of the latest information, much of which is not good:

- Only 15% of habitats are in good status and only 2% are improving.
- 57% of species are in good status. 13% improving.
- The last 12 years has seen a 38% decrease of bird populations.

The pressure and threats driving this include agriculture, development, water pollution, forestry – the wrong tree in the wrong place damages biodiversity – and extraction of resources that damages protected sites and species, and invasive species.

He outlined that there are conservation objectives set for each site. However, just setting the conservation objectives does not provide the means by which we meet them. Acting to meet these objects is the missing link in protecting these sites and species.



6.10 The Practical Side of Implementing, Monitoring and Enforcing

Shirley Clerkin, Heritage Officer, Monaghan County Council

Ms Clerkin outlined the wide ranging and challenging work of local authority Heritage Officers. She told members of the complex factors leading to biodiversity loss. This loss is incremental, progressive and often goes unnoticed.

She illustrated this with two examples showing the decline of important habitats in County Monaghan. Hedgerows provide important functions for nature, but County Monaghan surveys in 2010 and 2020 showed a 9% decline in the extent of hedgerows as well as a decline in the quality of remaining hedgerows. There are 714 wetlands in Monaghan. Between 2000 and 2006 wetlands declined by 10%. They are being infilled and drained, with a resulting loss in ecosystem services.

Ms. Clerkin told members that there's huge confusion on the ground about what and where is protected. It is very unclear who is responsible for ensuring which legislation is enforced. Who should one call when there is a problem?

She asked the Assembly: Does nature have an intrinsic right to survive? She observed that she works in a planning system, but there are no guidelines on how to implement or integrate biodiversity properly. She asked: What about incentivising positive nature actions? She concluded that people once celebrated the abundance of nature, today we are crying for its loss.



6.11 Resourcing the State's response to Biodiversity Loss

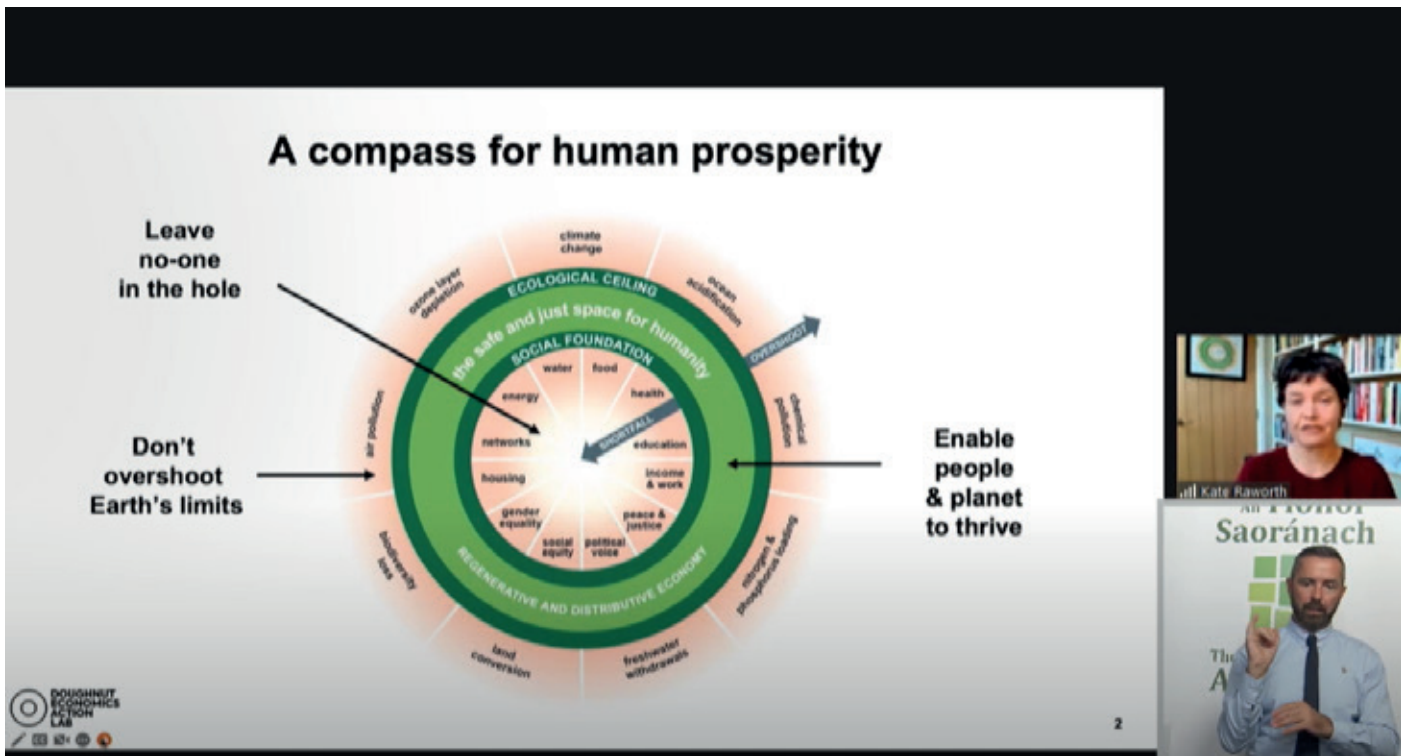
6.11.1 How Our National Budget Policy Works

Dr Eddie Casey, Chief Economist, Irish Fiscal Advisory Council

Dr Casey outlined the factors that combine to produce budgetary policy. He told the assembly that governments are not like households, as they can borrow, run deficits and tax (within limits). He outlined the concept of the debt ratio, when it becomes unsustainable and the effect this has on interest rates.

Dr Casey outlined the evolution of fiscal rules. He stated there are clear trade-offs and no free lunches. He outlined the current main pressures – aging population, overreliance on corporation tax, climate change, Sláintecare and housing – and showed the small areas where taxes can be raised.

Dr Casey concluded by telling members that the budget is a complex interaction between different stakeholders, rules, economic policies and competing demands. Governments are always firefighting. Will biodiversity ever be elevated to the top of the discussion?



6.11.2 Doughnut Economics

Prof. Kate Raworth, economist, creator of the Doughnut of social and planetary boundaries, and co-founder of Doughnut Economics Action Lab

Prof. Raworth presented the Doughnut as an economic concept for human prosperity. She outlined that our collective economic aim should be to leave no-one in the hole in the middle - leave no-one falling short on the essentials of life – but also not to exceed the life supporting systems that we have on earth. When we draw too much from our natural systems, it causes serious problems such as biodiversity loss. We need to live within the boundaries of the doughnut, where people and planet can thrive.

On a global scale humanity is way out of balance, massively overshooting pressure on the planet. We need to find a balance we have never found before. She explained that the economy is a social construct that was invented by humans and that human society is embedded in the living world and dependent on it.

She asked: How do we protect the foundations of life? We have inherited degenerative systems. This needs to be turned around. We need to create regenerative systems. She presented a framework for members to consider in addressing how to leave behind degenerative ways that lead to such issues as biodiversity loss and create regenerative systems that will lead to biodiversity restoration.



7

Summary Content of Meeting 3: 15-16 October 2022



The following is a summary of the meeting held on the weekend of 15-16 October 2022; a video record of the meeting, including presentations, plenary sessions and Q&A, is available on the Assembly's website at:

<https://citizensassembly.ie/citizens-assembly-on-biodiversity-loss/meetings/15th-16th-october-2022/>

7.1 The Natural World in Early Ireland

Dr Elva Johnston, School of History, University College Dublin

Dr Johnston gave a historical perspective on the relationship between people who have lived on this island and nature.

Between the 5th and the 12th century Ireland had a highly rural society bound by rules and laws, with a complex legal system known as Brehon Law. These laws outlined how to manage land, rivers and creatures on the land.

Dr Johnston explained that the place names we have today give insight into the use of land in the past. The names we have today are a direct link with that – achad (pasture, field) clúain (meadow), mag (plain), crúach (hill), druim (ridge), síab (mountain), daire (oak woodland), fid (wood), ros (wooded promontory, height), loch (lake, inlet), inis (bog island, island), móin (bog).

Dr Johnston outlined the relationship between the people and the animals that inhabited that landscape including cattle, sheep, pigs, goats, fowl, horses, bees, dogs, cats, fish, wolves and birds. Animals were not just there to be managed but also have personality and she outlined some of the relationships between animals and Irish mythology – e.g. The Children of Lir.

7.2 Agriculture

7.2.1 Agriculture and Biodiversity

Dr Helen Sheridan, School of Agriculture and Food Science, University College Dublin

Dr Sheridan gave an overview of the important agriculture sector:

- 135,000 farms cover 68% of total land area.
- The vast majority of land area is grassland with a small amount of cereal.
- Beef, dairy and sheep account for 80% of agriculture.
- Agriculture employs 163,000 people and accounts for 9% of national exports.

Farm systems are a function of soils, drainage and rainfall. Dairy predominates in the drier south and southeast (dairy has a larger than average farm size – circa 65ha compared to an average 33ha), beef is mainly in the border, midlands and west area (average farm size of 27ha), while sheep is mainly in the west and more marginal land. The average dairy farm income is €74,000, while cattle rearing farms have an average income of €9,000. Direct Payments through the Common Agricultural Policy account for about 28% of dairy income, but 157% of cattle rearing farm income and 105% of sheep farm income.

Biodiversity and its ecosystem services underpin the agricultural system. Dr Sheridan brought attention to the lack of knowledge about the soil and how it is affected by different farming systems. She highlighted the biodiversity value of multi-species swards and the importance of hedgerows.

She told the members that on farms in non-designated areas, semi-natural habitats account for an average of 13% of land. This compares favourably internationally, although the quality of habitat is questionable e.g. half of hedgerows are not in good condition.

Dr Sheridan told the Assembly of the need to manage and maintain biodiversity on good farming land. However, it is likely that high nature value farmland will be found in the more marginal farming areas of the west, north-west and midlands. Good practice, especially by those in financially vulnerable situations, needs to be recognised and rewarded.

7.2.2 Agricultural Biodiversity: Current policies, programmes and practices

Dr Daire Ó hUallacháin, Senior Research Officer in Ecology and Water Quality, Teagasc

Dr Ó hUallacháin gave an overview of Irish agriculture and land use. Agriculture accounts for 68% of our land area (EU average of 40%), while 11% is forestry (EU average is 40%). Highlighting the fact that we do not have a national landscape/habitat map means that, for most parts of the country, it is difficult to target or measure biodiversity actions.

He outlined the need to balance economic, societal and environmental concerns which will be different for each type of farm system.

National and international sustainability policies create a very complicated policy environment, in which biodiversity is just one objective. There are often synergies but also trade-offs when policies conflict, i.e. different policy timeframes and differing data underpinning policies.

While previous CAP policies had little positive impact on biodiversity, there is increasing integration of biodiversity and agricultural

policies. The challenge is now to deliver on these policies for the benefit of the environment and people depending on it.

CAP is the dominant budget for agriculture and the environment, and therefore for biodiversity conservation. 75% of all biodiversity expenditure is associated with agriculture. He outlined the current CAP provisions in terms of baseline requirements, as well as more enhanced and optional schemes such as the ACRES schemes. He also outlined European Innovative Partnerships - locally led approaches with farmers, scientists and advisors cooperating.

Dr Ó hUallacháin concluded by saying that nature conservation in Ireland is dependent on the agriculture sector. It needs to be guided by effective policy, implementation, monitoring, a recognition that one size does not fit all, the need for more data (particularly soil biodiversity), effective knowledge transfer and greater policy coherence.



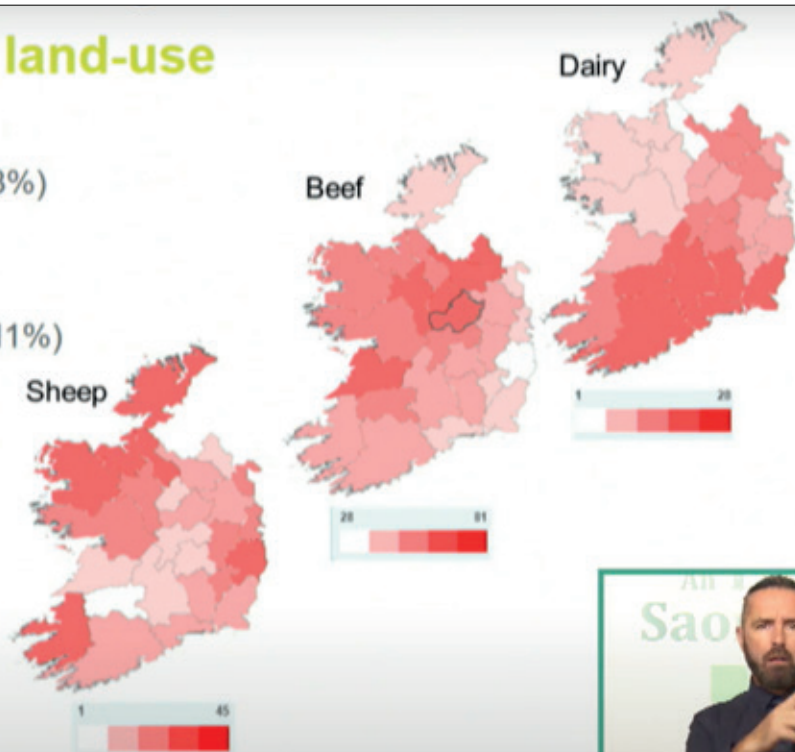
Irish agriculture and land-use

Land-Use

- Agricultural Land 4.5m ha (68%)
 - Grassland* 4.15m ha
 - Crops* 0.36m ha
- Forest 0.74m ha (11%)

Livestock

- 7.3m Cattle
 - 1.6m Dairy
 - 5.7m Beef/other
- 5.5m Sheep



Significant variability in our farming systems



The Irish Agriculture and Food Development Authority



Irish landscape

Variability

- Soil type
- Geology
- Climate
- Habitat quantity, quality, diversity?

Lack of National Habitat Map

Right Measure: Right place?

Ecosystem goods and services

Provisioning Services Food and fuel

Regulatory Services Climate, water

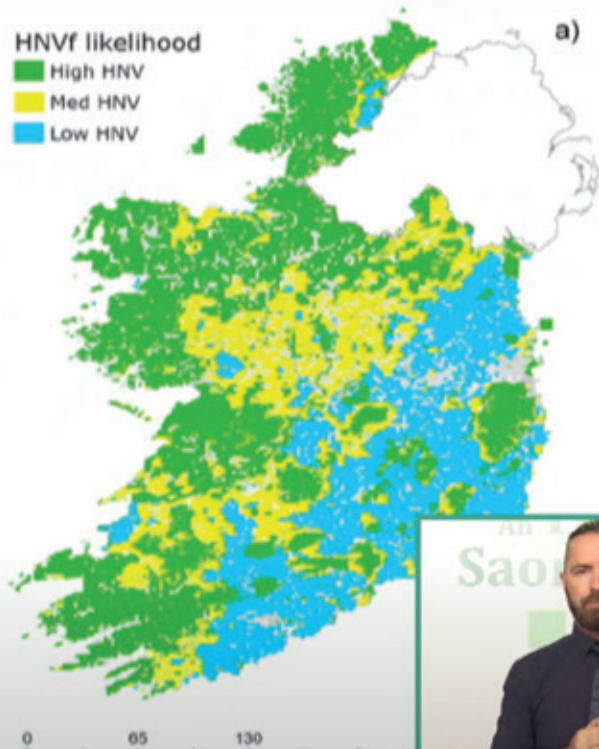
Cultural Services Aesthetic, recreational

Supporting Services Soil, nutrient cycling

Significant variability in landscape and ability to deliver ecosystem services

HNVf likelihood

- High HNV
- Med HNV
- Low HNV



The Irish Agriculture and Food Development Authority



7.2.3 Voices from the Farming Sector

Eight farming organisations were invited to send a representative to address the Assembly on the successes and challenges they experience when considering farming and biodiversity.



Macra na Feirme – Shane Fitzgerald

Mr Fitzgerald is a dairy farmer from Waterford, whose farm is a participant in the Teagasc Signpost Programme. He spoke about his intensive dairy farm and how his family is engaging with biodiversity. He explained the benefits of increasing biodiversity on the farm – increasing wildlife, improving well-being, and aesthetics as well as saving on the use of pesticides.

He told the Assembly about schemes supporting biodiversity on the farm and that farmers will embrace these policies. But he emphasised the need for baseline information about farm biodiversity, the need for education and the importance of engaging with young farmers.

Irish Farmers' Association – Paul O'Brien

Mr O'Brien has been a sheep and tillage farmer in Graignamanagh, Co. Kilkenny for 34 years. He spoke about the system of extensive farming in Ireland, where the average livestock farm has 69 cattle and the average dairy herd is 83 cows. He told the members that just 42% of Irish farms are financially viable.

He outlined the national contributions farmers have made to biodiversity: there is 12-14% space for nature on farms, 6,600 km of hedgerows have been planted on farms since 1994 and one third of farms are classified as high nature value.

Mr O'Brien told the members that there should be increased ambition and opportunity for farmers to take part in environmental schemes.

Fully funded environmental and biodiversity schemes are needed but engagement with farmers on these is important.

Irish Cattle and Milk Suppliers Association – Pat McCormack (President)

Mr McCormack is a County Tipperary dairy farmer who supplies Tipperary Co-op with spring calving herd. He is a commercial farmer with a young family.

Mr McCormack told the members that engagement is key. Commercial farmers can interact with nature and explained that we need to leave space for wildlife e.g. hedgerows, clover coverage. He asked why should any farmer be excluded from an environmental programme? Because if everybody does something we can achieve a lot. As an industry that is seen as being harmful to the environment, they are incorporating new practices and his association want to engage fully on this issue.



Organic Association of Ireland – Stephen Meredith

Mr Meredith is an organic beef and tillage farmer, working with his father and brother near Ballylinan, Co. Laois.

Mr Meredith outlined that organic farming optimises productivity without harming the environment. Organic farmers look at farm biodiversity both above and below the ground. They try to strike balance between getting good production and allowing nature to work for us. Soil biodiversity is key, but biodiversity is important across the farm in, for example, ponds, native woodlands and hedgerows. All farmers have to strike the balance between production and biodiversity management.

He told the members that costs related to biodiversity are not necessarily reflected in prices. Therefore, policy incentives are important - public money for public goods is important. There are positive moves in this area but it's important that when farmers want to go further that they are appropriately paid for these efforts.



Talamh Beo – Maurice Deasy

Mr Deasy is an arable and sheep farmer with his father in North Tipperary. He talked about the importance of soil as 'the skin of the earth'.

He outlined that our cheap food policy means fewer farmers, more machines, more risks for farmers and smaller returns. It means less crop rotation, less market outlets, lower soil carbon, less soil health and more specialisation in farming.

Describing his own farming practice he emphasised cover crops, crop rotation and reduced tillage which increases biodiversity, reduces costs, improves soil health, soil carbon and carbon sequestration. He is on a journey to get soil carbon up, which will take 5-10 years and will be done with no monetary reward.

He told the Assembly that soil is not dirt, it is microbiology. A teaspoon of soil has the same amount of microbes as there are people on the planet. Good soil health means healthy plants, healthy plants mean healthy animals, healthy animals means healthy humans.



Irish Natura and Hill Farmers Association – Aideen McGloin

Ms McGloinn is a sheep and beef farmer in the Ox Mountains, south Sligo.

Ms McGloin told members that the INHFA was set up in response to a sense of alienation felt by farmers on hill, designated and environmentally valuable land. They highlight challenges and work for recognition of the environmental goods they produce, in addition to food.

She told the members that farmers follow policy and that they use policy to make changes in how they approach nature. Farmers have removed biodiversity because of policy and income. The limited eligibility of biodiversity areas on farms for payments has been disastrous. Agri-environmental schemes are targeted at what are described as the most appropriate areas but, she asked, why is biodiversity not important in all areas?

She told the Assembly that farmers need long-term commitment. Farmers have no certainty if rules change on a 5-year cycle. What is being asked of them now is a huge sea change.

She told the Assembly that rules are imposed on farmers, rather than developed in consultation with them. As a result, farmers on designated lands do not trust the policy makers.

She concluded by saying that interventions should be designed with farmers, farmers should be paid for the environmental goods they provide, there should be long-term policy commitments and farmers should be treated with respect.



Irish Cattle and Sheep Farmers Association – Dan Lynam

Mr Lynam has been a farmer for 55 years. He farms 400 acres with his son in Westmeath.

Mr Lynam told the members that his family has farmed this land for five generations. However, there has never been as great a challenge on their farm than today due to the rules, regulations and paperwork required, while costs spiral and prices are not predictable. Farmers are more and more under direct attack from outside forces, while they work harder and longer hours than any other profession. This puts huge pressure on a young family such as his son's.

He shared photographs of his farm showing a wildflower garden, organic potatoes, birdboxes, areas set aside for wild bird cover as well as 2km of hedgerows they have planted. In one series of works he spent €10,000 on biodiversity measures. Farmers, he said, do understand biodiversity.

He told the members that the Department is bringing out new schemes with very little reward for farmers and just 10% of farmers eligible for the maximum amount of money. He told the Assembly that it (the environmental subsidy scheme) is not working.



Irish Grain Growers – Pat Cleary

Mr Cleary farms 600 acres in Kildare with his two sons, the family's 6th farming generation. They started minimal cultivation on their farm in the 2000s.

Mr Cleary explained that grain growers represent a very small part of the agriculture sector and that just 6% of agriculture area is arable farm. But what they produce is significant. Arable farming has the lowest carbon footprint, enhances biodiversity and provides a diverse array of products. But there is a lack of support and lack of awareness of the arable sector.

He outlined the decline of the arable sector in Ireland since the Second World War. Today there is 360,000 ha of arable farming.

Mr Cleary told the Assembly that his farming practice is about getting the soil in good order for biodiversity. He explained his crop rotation and its benefits for biodiversity as well as reduction in imports, nitrogen and pesticides.

He told the members that Ireland could double the amount of land under arable.

7.2.4 What can we learn from other countries?

Prof. Lynn Dicks, Department of Zoology, University of Cambridge

Prof. Dicks began with a few figures to show how important agriculture, and certain agriculture, is globally:

- 71% of the planet is habitable land.
- 50% of this habitable land is used for agriculture.
- 77% of this agricultural land is used by the livestock industry.
- 18% of human's calorie intake comes from this 77% of agricultural land.

Globally the expansion of agriculture is the biggest driver of biodiversity loss. If we want to reverse biodiversity loss and bring our biodiversity back to a thriving level we need to look at the food production system.

She outlined that we need to do four things:

1. Stop expanding agriculture into natural habitats. Globally the main areas where agriculture is expanding is south Brazil, west, east and parts of south Africa. This expansion can be the cause of economic development, and these are difficult issues to address.
2. Produce food efficiently, on the smallest possible footprint.
3. Produce food in a way that does not degrade land.
4. Reduce land demand by changing our diet and reducing food waste (which accounts for up to 50% of food produced).

Ireland has an impact on this global picture and is an integral part of it. We import 75% of our food and a large quantity of animal feed. Our biodiversity footprint is global and directly affects the areas losing natural habitat in many parts of the world.

To address this we need to do two things:

1. Lessen the impact of farming on biodiversity.
2. Change our consumption patterns to consume less of the most damaging agricultural products.



7.2.5 Engaging and motivating farmers to reverse biodiversity loss

Brendan Dunford, Manager of the Burren Programme and Founder of the Burrenbeo Trust

Mr Dunford told the assembly about the work in the Burren in Clare and Galway and the successes over the last 25 years of working with farmers to conserve and restore biodiversity. He emphasised that farmers can be the solution to biodiversity loss.

When asking farmers to do something other than produce food, they need to understand what it will cost, who will pay, who will give them information and what will the neighbours think?

Mr Dunford told the Assembly that there were three parts to the success: incentives, information and heart. Incentives of €1.2 million per annum have been provided to farmers in the area. Farmers do not respond to being told what to do but instead, having learned about biodiversity, they respond to being told what the result should be. Farmers were also provided with clear information, were helped with paperwork and participated in a variety of community projects. The final element of the work was recognising the identity and heart of the farmers as critical. As a result, the Burren is an exemplar of how farming can work to improve biodiversity.

Mr Dunford also outlined the national Farming for Nature programme, which identifies, celebrates and supports what he described as ‘conservation heroes’, and the Hare’s Corner project, which funded small biodiversity projects throughout Clare.

He concluded that farmers have a critical role to play to address the biodiversity crisis and need to be mobilised at scale. There is an appetite, but it needs to be addressed through the pocket, the head and the heart and will come down to the question: how badly do we want it?



7.3 Forestry and Woodlands

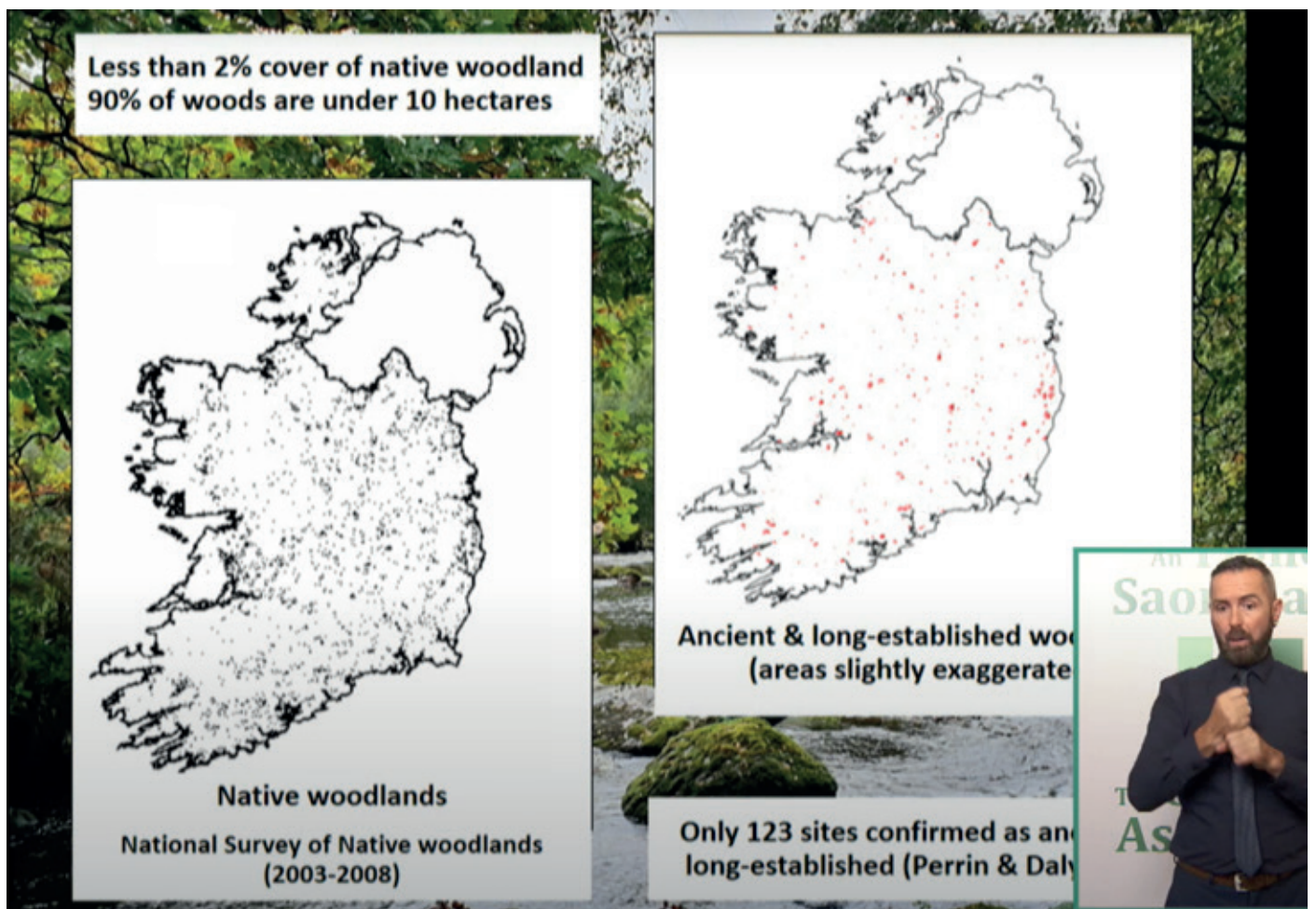
7.3.1 Overview: Woodlands and Forestry – Biodiversity Loss and Recovery

Richard Nairn, Director Natura Trees, member of the Steering Committee of the Woodlands of Ireland

Mr Nairn described his own small woodland in Wicklow, which has a huge range of biodiversity. A one day ‘biodiversity blitz’ identified a huge number of trees, plants, ferns, mosses and liverworts, fungi, moths, molluscs, freshwater invertebrates, birds and bats. The key contributory factor to this is the age of the woodland and continuity both for the forest and the soil structure.



Mr Nairn outlined woodlands in Ireland. 6,000 years ago 80% of Ireland was woodland. In 1922 it was 1%. Today, less than 2% is native broadleaf woodland which is highly fragmented across the landscape. There are just 123 ancient or long-established woodlands left and many of these are in poor condition due to invasive species and grazing, especially by deer. 9% of our land is currently commercial forestry plantation.



The main option for restoring woodlands is the Native Woodland Scheme, which is supported by government grants. However, there is a low take up due to the limited number of years that finance is available. Only 500ha per annum are being grant aided under this scheme, with only 70% of the budget taken up.

One of the main problems for woodlands are non-native deer which are not managed. There is no plan for dealing with them.

There is a 15% provision for broadleaf in commercial plantation schemes but that is not enough. There is also a need for continuous cover forestry rather than short rotation.

Mr Nairn concluded that there was a new Forestry Programme due to be announced and that this may have positive new measures.

7.3.2 Coillte Forestry and Biodiversity

Mark Carlin, Managing Director of Forestry, Coillte, with Dr Ciarán Fallon, Director of Coillte Nature.

Mr Carlin told the members that Coillte manage 7% of our land or 440,000ha. This is 50% of all the forests in Ireland. It is the largest producer of timber and wood, the largest provider of recreation area and has the largest habitats in the country.

Coillte is looking to the long-term development of their land, aligning them with multiple UN Sustainable Goals. This breaks down into four main objectives:

- Forests for Climate
- Forests for Nature
- Forests for Wood
- Forests for People

Coillte needs to balance these objectives.

Mr Carlin outlined that 20% of Coillte land, 90,000 ha, is managed for biodiversity. This includes ancient woodlands, native woodlands and more open habitats which contain a rich amount of biodiversity. The aim is to increase this by 45,000 ha by 2030. The long-term plan is to increase this to 50% of all Coillte land.

The pressures faced include invasive species and wild deer, which is a problem that needs to be addressed.

Mr Carlin outlined some projects being carried out by Coillte Nature in the area of restoration, regeneration, rehabilitation and afforestation. He concluded that Coillte's challenge is to strike the right balance.

7.3.3 Woodlands and Forestry Video¹²

The members were shown a specially produced video featuring three different woodlands and outlining how they are managed. Caroline Stanley told the story of a community woodlands project in Galway City called Friends of Merlin Woods. This 200-acre woodland has been improved by this group over the last number of years, but the woodland faces significant development pressures and threats. Andy Francis, from Tipperary, whose farm includes a Sitka Spruce plantation, spoke about transitioning from cattle farming to forestry and the economic issues around that decision. Eoghan Dalton, author of An Irish Atlantic Rainforest, spoke about his rewilding project in the Beara Peninsula, Cork, where he has returned the land to a temperate, natural rain forest and the huge benefits to nature that has resulted.

Each of the speakers agreed to come to the Assembly and had an opportunity to briefly address the members on anything they thought had not been covered in the video before answering questions from the members. Andy Francis told the assembly that although her Sitka plantation is non-native woodland it is better for biodiversity than it was when it was grazed farmland.



¹² <https://youtu.be/tGys3E0WojU>

Caroline Stanley talked about the council, planners and their lack of care of woodlands and trees in towns. She pointed out that urban trees and woodlands are just as vital for habitats and wildlife connections as they are in rural areas. In large built-up areas nature is vital.

Eoghan Daltun told the Assembly that Ireland is one of the most nature depleted countries on the planet. In order to reverse this collapse we need to understand that in prehistory our island was covered in wild natural habitat. We now have 1% of natural forest. He told the members that Ireland is almost a biodiversity desert – there is almost nothing there. We could not be in a worse position. He suggested the solution to this is rewilding our wild habitats. He suggested a way of doing this is the provision of subsidies to farmers to rewild their land.

7.4 Environmental Rights

7.4.1 Environmental Rights and the Rights of Nature

Prof. Aine Ryall, School of Law, UCC

Prof. Ryall introduced the relationship between environmental protection and human rights. Prof. Ryall highlighted that the right to a healthy environment is recognized by many states around the world and, where that is the case, the right is typically established within constitutional and/or legislative frameworks. She described as 'significant' a recent decision by the UN General Assembly to recognize the right to a clean, healthy and sustainable environment as a human right.

Prof. Ryall explained that procedural rights can be considered as tools to enforce the substantive right to a healthy environment. The Aarhus Convention requires states to guarantee the three procedural rights: i) the right to information on the environment; ii) the right to participate in environmental decision-making and iii) the right of access to justice in environmental matters.

The Irish Constitution does not include any reference to a right to a healthy environment. However, in 2017 the High Court determined that there was a constitutional right to an environment that is consistent with human dignity. The Supreme Court did not support this, but in a 2020 ruling made an observation that in other jurisdictions specific wording has been inserted into constitutions when they were being adopted or amended. The Supreme Court appeared to suggest that rather than the courts deciding the issue an amendment to the constitution could be considered.

Prof. Ryall then examined rights of nature laws to provide a framework to reconceptualise our relationship with nature. Rights of nature laws regard nature itself as being a legal entity having enforceable rights in the same way that companies have rights. Rights of nature laws can include the right to exist, flourish and to be restored if degraded, as well as mechanisms to go to court to defend the rights of nature because nature cannot speak for itself. This has been done both through constitutional and legislative means in various jurisdictions.

Prof. Ryall outlined that there are many examples of rights of nature laws in action - Ecuador, Bolivia and Spain.

Prof. Ryall emphasised that law on its own is no silver bullet. They must be implemented, enforced and have proper governance.



7.5 Peatlands

7.5.1 Overview of Peatlands and Biodiversity

Dr Catherine Farrell, Ecologist, Coordinator Peatlands Gathering 2021

Dr Farrell outlined that healthy peatlands are wetlands – if you don't have your wellies on, you're not in a proper peatland. Peat is partially decomposed plant material that has accumulated over time. It is dominated by sphagnum moss that has developed in waterlogged soil to form peat. There are peatlands in nearly every county in Ireland. About one-fifth of Ireland's landscape is peatlands (we also have fens) and Ireland is globally significant, so we have a huge responsibility.

Our peatlands improve and regulate water, they are a very important carbon store (peatlands cover only 3% of earth's land surface but store double the amount of carbon than all forests), they are vulnerable habitats that support vulnerable species and they also have important cultural and social values.

Peatland biodiversity is intricately entwined with water and peat. About 59 species of Irish birds occur on peatland, most as breeding species, 26 of Ireland's mammals are dependent on peatlands in some phase of their life cycle and 65 of Ireland's butterfly species are found on peatlands. Only 10% of Ireland's biodiversity in such habitats has been properly assessed.

We have mined peatlands for fuel and drained large areas for agriculture and trees and planted peatlands with wind turbines. Only small fragments of peatlands are intact. We continue to lose biodiversity, reduce water quality and lose carbon.

The original driver was the need was to heat homes. Later, once an economic value in peat was identified, extraction at industrial level evolved. Many people still use only peat for home energy. Dr Farrell said that we need to give those people an alternative – a true just transition – in order to move away from peat burning.

However, Dr Farrell explained that it is not all bad news. Bord na Móna are now trying to restore peatlands, there is the work of the Community Wetlands Forum, the Wild Atlantic Nature LIFE project, Coillte, SUAS, the Natura 2000 network- all doing positive work for peatlands.

She told the Assembly it is time to rethink policy, renew ambition and innovation. We need to develop a peatland action plan. It does not need a lot of money. It needs will, wisdom, flexibility and clear thinking. It is definitely time to restore. Inaction is not an option. However, this involves clarity of roles and responsibilities, legislation and policy, followed by regulation, enforcement and the prominence of leaders and champions of peatlands.



7.5.2 Voices from the Peatland Communities

Seamus Boland, Chief Executive of Irish Rural Link

The objective of Irish Rural Link is to support sustainable rural communities. Mr Boland is involved in the Clara Bog Pilot Project and the Just Transition Programme.

He told the members he had been asked to give a view from the perspective of turf cutters and insight into the difficulties there have been around this issue. He was once a turf cutter, as was his father and grandfather before him, and is proud to be from the bog. Mr Boland told the members that recent history of the bogs and turf cutting is one about managing change.

In 1998, under the Habitats Directive, people were ordered to stop cutting turf. This was done without much notice and without consultation, which resulted in fierce opposition. He told the Assembly that 100,000 people (estimated by Irish Rural Link) depend on turf for domestic heating and cooking. They were told they had to stop, without being given an alternative or a process.

However, a decade long compromise was reached, which included an understood derogation from the Habitats Directive. Mr Boland told the Assembly that during that time mechanisation of turf cutting was introduced and this increased turfcutting fourfold, destroying a lot of bog.

Many expected the derogation to continue, but in 2010 the EU intervened to enforce the ban of turf cutting on 31 sites. The department and government began to engage in discussion and Mr Boland told the members that the Clara Bog Committee engaged on the issue. In the end some relocated their turf cutting to a non-designated site or availed of compensation of €1,500 per annum over 15 years. Turf cutting at Clara Bog ended and since then there has been some restoration and a pilot project with neighbouring landowners to support the bog. However, even at the end of this very acrimonious process, many of the people involved said that they want to be part of the next chapter of Clara Bog.

He concluded by telling members that heat, not turf, was the problem. Turf is the cheapest fuel available for a large number of local authority tenants. None of these have had a retrofit to update their houses to a different form of fuel. What is stopping that, he asked.

Ciaran Duggan, a member of the Community Wetlands Forum from Carbury, County Kildare

Mr Duggan told members that 180 hectares of Carbury Bog have been in community ownership since 1906. Community ownership has been important for the survival of the bog. The community has looked after it, used it for fuel, protected it and resisted several attempts to have the bog take over by industry or used for forestry, though they did allow mechanised extraction in a small area.

When the bog was designated as a Natural Heritage Area (NHA), the community received a letter telling them what they shouldn't be doing, despite the community not doing any of these things.

When discussing what to do with their non-designated bog they have received excellent support from the Community Wetlands Forum – a group who were trying to address the same issues as them.

He finished by telling a story of coming across the remains of a 3,000-year-old deer and evidence of a fire. The bog has preserved that for them. It was up to us now to preserve the bog.

Nuala Madigan, Chief Executive, Irish Peatlands Conservation Council

Ms Madigan told members that the Council was founded in 1982 to conserve a representative sample of Irish bogs for the future. Outlining the importance of peatlands for biodiversity, Ms Madigan told the Assembly that 18% of Irish landscape is peatland, 15% of original Irish flora are peatland species, 14% of birds occur on peatland (most as breeding species), 26% of mammals depend on peatland in some phase of life, 65% of butterflies are found on peatland.

However, the situation regarding the condition of peatlands and peatlands biodiversity is not good. 75% of peatland habitat has been mined or drained and just 1% is actively growing. The conservation status of all bog types is 'Bad'. 27% of bog forming sphagnum mosses, 44% of peatland bird species and 20% of peatland plant species are on the red – endangered - list.

Our peatlands are not in a healthy condition. But it is not too late, she told the members, noting the Council have produced their 6th Action Plan which the members may wish to consult.

Actions that can be taken include the protection of designated sites and the overdue formal designation of proposed NHAs, restoration and rehabilitation of peatlands, the carrying out a complete inventory of peatland biodiversity, encouragement of landowners (60% of bogs are privately owned) to protect biodiversity through a nationally funded scheme, increasing awareness and, importantly, integrating peatland biodiversity into all government departments and development plans.

She concluded by saying that we can't go backwards, but today we can benefit from our greater understanding and research.

7.6 Irish Language and Mythology as Primers for Sustainable Living

Manchán Magan, Writer and documentary maker

Mr Magan advised members that in their deliberations when looking to the future and rethinking the present, they should also look to our past. On the west coast of Ireland we have people with the DNA of our Bronze Age ancestors. They should remember that today, within the Irish language, culture and myths, there are thousands of years of accumulated knowledge and great sources of wisdom. He alternated between Irish and English to illustrate how the language, culture and myths contained that knowledge that can help us to live sustainably.

Our society evolved to live in a wild, rocky, windy island in a sustainable way because we became so attuned to the land and landscapes. He gave an example of a young man who was only allowed to have children when he could prove that he could live sustainably. We have only survived on this island because our ancestors learned to live sustainably and harmoniously with nature.

He told the members that all but two of our rivers have female names, that they are female beings. If we regarded rivers in the same way today how would that change the way we treat them? He said we would not be pumping nitrates into them.

Every community once had a sacred tree, more important and lasting than a king. We may have lost the ancient trees, but we have not lost the memories of them.

We also had a profound understanding of the sea and that too is encoded in the language.

Mr Magan told the Assembly that if we want to know how to live in a sustainable way, that knowledge is still encoded within our language and oral tradition. In a world full of uncertainty we might need the information embedded in this culture and heritage.



8

Summary Content of Meeting 4: 5-6 November 2022



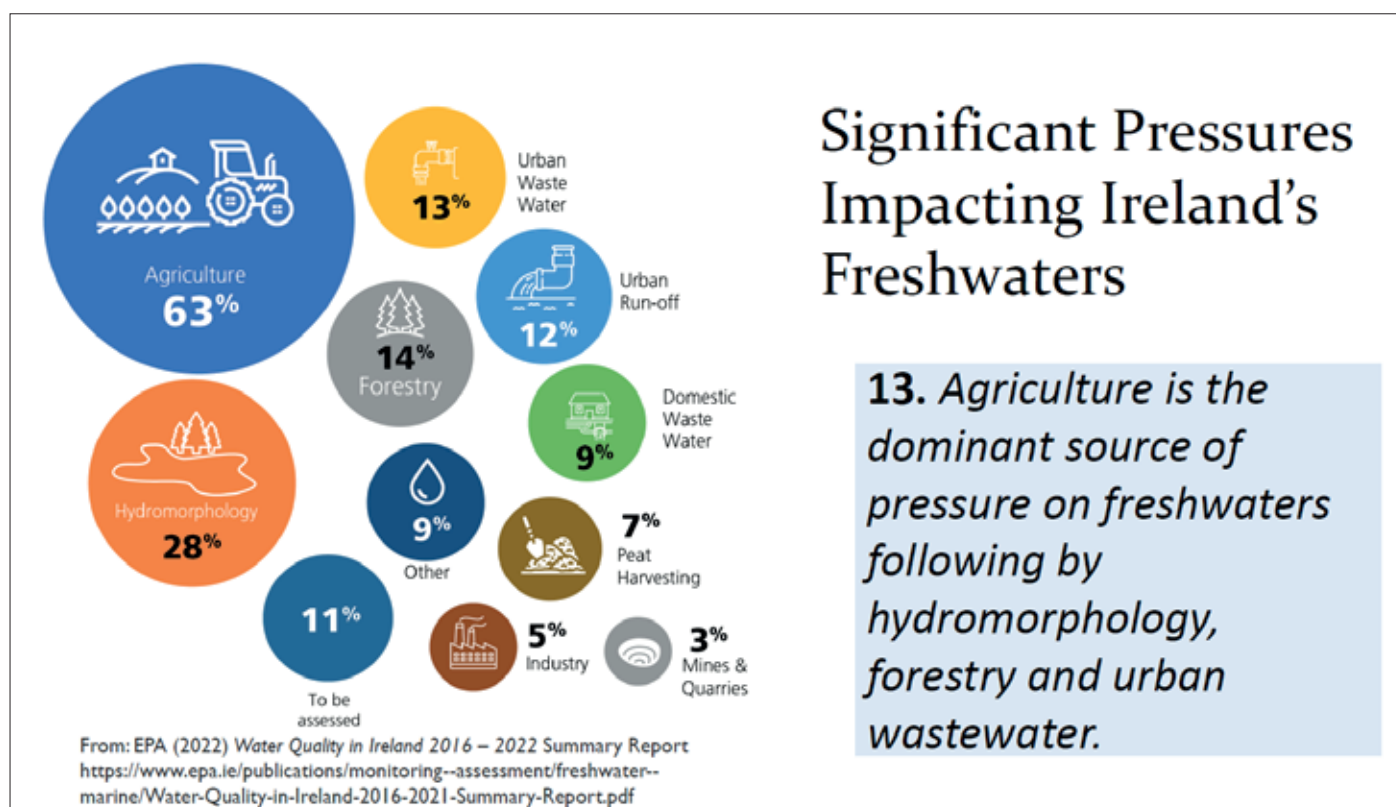
The following is a summary of the meeting held on the weekend of 5-6 November 2022; a video record of the meeting, including presentations, plenary sessions and Q&A, is available on the Assembly's website at:

<https://citizensassembly.ie/citizens-assembly-on-biodiversity-loss/meetings/5th-6th-november-2022/>

8.1 Freshwater

8.1.1 Water Quality and Biodiversity Pressures in Ireland's Freshwaters

Prof. Mary Kelly-Quinn, School of Biology & Environmental Science,
University College Dublin



Prof. Kelly-Quinn outlined the importance of freshwater and the essential ecosystem services they provide. They are human civilisation's lifeblood. We are losing freshwater species faster than any other ecosystems. It is an invisible tragedy.

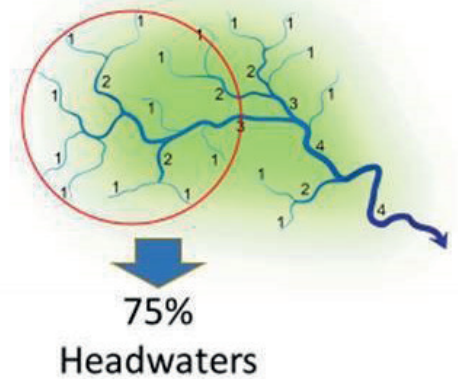
Ireland has 184,000kms of freshwater channels. 75% are small headland streams less than 2m wide. These are the most important and vulnerable parts of the system. Ireland has 12,200 lakes (2% of land area) - most are less than 1ha in area - which provide significant contribution to biodiversity. Various wetlands are regarded as the kidneys of the landscape.

She told members that natural bankside vegetation - riparian zones - have strong linkages with these aquatic systems and are essential for their health and protection from pollution.

Prof. Kelly-Quinn outlined the variety of species in freshwater systems and showed the difference between healthy and unhealthy systems.



Ireland's Rivers



3. Headwaters are the most vulnerable part of the river network but critical for biodiversity and water quality protection further downstream.

She reported that almost 50% of freshwater aquatic ecosystems are in unsatisfactory ecological condition due to:

- Agriculture, which is the dominant cause with run-off of nutrients, excess fine sediment and pesticides.
- Land drainage.
- Discharges of poorly treated or raw sewage from urban wastewater treatment plants, domestic treatment systems and storm water overflows.
- Run-off of nutrients and excess sediment from forestry operations.

She reported that the decline of our freshwater systems is largely driven by agriculture intensification. The number of near pristine river sites have declined from over 500 in the 1980s to 32 today. 20% to 30% of assessed freshwater biodiversity are vulnerable or at worse conservation status. There is a lack of data for many species.

Prof. Kelly-Quinn concluded by telling the Assembly that we are at a tipping point, after which it may be impossible to reverse the damage. There must be a sense of urgency in tackling declining water quality and biodiversity loss. Climate change will exacerbate the challenges and while lots of good work is ongoing it is not at sufficient scale. An Emergency Plan with coordinated actions is needed.

8.1.2 Freshwater Catchments in Ireland – Issues, Challenges & Solutions for Aquatic Ecosystems

Donal Daly, Catchment Scientist and Hydrologist

Mr Daly outlined that almost 50% of freshwater aquatic ecosystems do not meet their environmental objectives. Targeted actions, utilising the right measure in the right place approach, are needed.

We need disciplines and public bodies to move away from siloed approaches to an integrated



approach to freshwater management. He told the Assembly that An Fóram Uisce's proposed Framework for Integrated Land and Landscape Management provides an appropriate approach.

River catchments are the best landscape units for management of aquatic ecosystems. There are 46 catchment management units and 583 sub-catchments in Ireland. Understanding each is critical to achieving the 'right measure in the right place'.

Catchment science, encompassing the appropriate disciplines (e.g. ecology, agricultural science and environmental science), provides the required specialism. Thus, collaboration between relevant organisations and training in catchment science are needed.

Dr Daly told the members that agricultural activities pose the greatest threat to aquatic ecosystems. Tiny losses of phosphorous from farmland – less than 5% of applied phosphorus - to streams can cause significant impacts. Fixed buffer zones (e.g. 2 m, 5 m) in the regulations are often inadequate. He told members that there needs to be spatially targeted buffers, as well as planting of the right trees in the right place, to help minimise phosphate losses.

Dr Daly informed members that nitrate is a particularly challenging pollutant, as it enters groundwater in freely draining land and then into estuaries (particularly along the south coast). As compliance with regulations may not be sufficient, large reductions in nitrate loads are needed.

Farm inspections are not adequate on their own in restoring our ecosystems. The involvement, co-operation and co-ownership by farmers is essential.

He told the Assembly that future success will require resources for:

- an adequate number of scientists and farm advisors trained and working as catchment scientists.
- sufficient targeted farm inspections based on evidence-based catchment science, with sanctions where necessary.
- a results-based payments approach - pay farmers adequately for public goods provided.

- collaboration and mutual learning between relevant organisations, disciplines and communities.

8.1.3 Pressures on Freshwater Biodiversity in Ireland

Dr Bernadette White, Local Authority Waters Programme (LAWPRO)

Dr White told the Assembly that our freshwaters and marine ecosystems are being damaged by pollutants and damage to habitats. The majority of our high-status waters are not in good condition. LAWPRO looks at prioritised areas for action which concentrate on local catchments and small streams. Dr White outlined four main pressures.



The overwhelming evidence is that agriculture is the largest cause of water quality decline. Over 92% of problems are due to agriculture. She told the Assembly a pollutant-driven solution is needed to significantly reduce the impact of phosphate run-off, which causes algal blooms in rivers and lakes. She told members that sediment caused by land use activities smothers riverbeds, impacts the habitat of fish and macroinvertebrates. Members were also told that nitrates cause problems in estuaries: 43% of rivers have high nitrates and 39% of rivers have increasing nitrate. In addition, Dr White reported that pollution caused by silage effluent, dairy washings, slurry, etc. is hugely damaging. Rivers have also suffered from straightening, deepening and widening, as well as the removal



of bank side vegetation, largely to facilitate drainage of agricultural lands, or via the Arterial Drainage Act.

Dr White informed the Assembly that forestry can increase nutrients such as phosphate and increase sediments. Legacy forestry on unsuitable sites pose a significant future risk. Urban waste water causes organic pollution and excessive nutrients. There is particular concern around smaller wastewater plants in towns and villages.

Dr White told members that better regulation, enforcement and better recognition of environmental damage in the court system is needed. Communities want better drinking water and space for nature and wildlife for now and future generations. An integrated approach is key. LAWPRO is championing nature-based solutions and working to increase community participation.

She concluded by telling the members that the evidence of damage to our freshwater is clear. She emphasised that the sense of urgency voiced by scientists and communities is not being translated into adequate financial, legal and other supports that are required to address the issue.



8.1.4 Voices from the Freshwater Community

Colm Gallagher, Chairman of Cloghaneely Angling Association, Falcarragh, County Donegal

Mr Gallagher spoke about the essential importance of biodiversity and catchment management to anglers. He spoke of the wonderful freshwater environment in Donegal for angling, but highlighted the deterioration of water quality especially in the small streams in the upper stretches of their two rivers. The Angling Association produced a catchment management plan in 2018. As solutions need to involve the whole community, they have a Catchment Management Group made up of representatives of state bodies, local landowners, businesses, community and volunteer bodies which they consult with at all stages.

The Angling Association have conducted a study on the sources of silt in the rivers, which is their main problem. Siltation from quarrying activity and run-off from peat cutting, has had a huge impact on salmon spawning grounds. Mr Gallagher told the members that they have been in court for two years trying to stop what he described as illegal quarrying. The Association has invested in monitoring equipment, working with partners and local communities to promote and protect freshwater quality.

Barry Deane, Chief Executive Officer of the National Federation of Group Water Schemes

Mr Deane described some of the ways in which the community-owned group water schemes are working to halt and support biodiversity loss. He told the members that trust is the core value underpinning successful group water schemes. Schemes depend on building and maintaining trust within local communities while trusted local champions are key to engaging people at a local level.

There are multiple co-benefits to group water schemes. For instance, water quality for group schemes is seriously threatened by the increasing risk of pesticides - an issue also impacting on biodiversity. He outlined examples of local farmers supporting group water schemes, for example giving up small parcels of their land to create buffers in targeted areas to prevent flow from overland sources when the ground is saturated. This not only protects the scheme's water quality, but also benefits biodiversity. The social capital within community structures, such as group water schemes, is a powerful tool that needs to be exploited to the full to deliver co-benefits to society and biodiversity.

Trish Murphy, Project Officer with the Inishowen Rivers Trust

The Inishowen Rivers Trust was established in 2016. It is one of a growing network that works to protect, restore, enhance and conserve the natural water bodies and to communicate with the public and agencies.

Ms Murphy told members that the Trust is engaged in a series of nature-based solutions to respond to problems that affect all rivers

in Ireland e.g. flooding, sedimentation, run off, invasive species and hydromorphological modifications. Habitat restoration is key.

She outlined some of their projects. These are soft engineering solutions to support natural flood management, bank erosion control measures to repair and restore normal functioning, in-stream barrier mitigation, organic control measures and community awareness around invasive alien species. She also told the Assembly about measures taken to reduce the impact of agricultural activity by working with farmers to improve riparian buffer zones, and measures to enhance biodiversity through creating natural corridors, tree planting and public awareness. Organic bioremediation of invasive Japanese knotweed has been successfully trialled and is now being scaled up.

Bernadette Connolly, Sustainable Water Network

Ms Connolly told the Assembly there are 25 members of the Sustainable Water Network around the country and their focus is to meet the aim the new draft River Basin Management Plan of having all water in good status by 2027.

She told the Assembly that their assessments, based on chemistry and biodiversity, found that almost 50% of waters are not in good status and that all pressures are going in the wrong direction. She told members that we are at a critical juncture. Previous River Basin Management plans have failed, and the current draft plan is not ambitious and does not have enough targeted measures.

She highlighted the importance of invertebrates for freshwater biodiversity and that 88% of our SACs are dependent on freshwater habitats, which are not in good condition.

Ms. Connolly proposed a number of measures including that the new National Biodiversity Plan be put on a statutory footing, a national river, lake and wetland restoration programme should be developed, there should be reform of the Arterial Drainage Act 1946, wetland drainage should be prohibited and all forestry operations to be subject to a satisfactory assessment under the Water Framework Directive. In addition

she highlighted that measures should be taken to halt sewage discharges to polluted water bodies and agricultural risk assessments should be introduced for all intensive farms under a permitting/ licencing system. She emphasised the importance of public and community involvement.

She told the members that water is our life source and the quality of our water is a profound, persistent and important issue that needs to be addressed.



8.1.5 Overview of Invasive Species and Freshwater.

Prof. Ian Montgomery, Emeritus Prof. of Animal Ecology, Queens University Belfast, member of the EAG

Ireland has roughly 17,000 species of which about 1,200 have been introduced. 124 of the introduced species are classified as invasive, having medium or high negative impact on biodiversity. There are about another 40 potential invasive species that might come our way in the not-too-distant future.



Prof. Montgomery said that this is a neglected area with little data.

The composition of our ecological communities is unique and we have unique genetic material on the island of Ireland. There are separate bodies, north and south, dealing with invasive species which are coordinated to some extent, while there is an issue with internal invasive species in the EU.

Prof. Montgomery told the Assembly that invasive species are a growing problem with a recent upsurge in the problem due to global trade and climate change. Plants contribute greatly to our invasive species, and we can expect more simply because of climate change. From case studies of trees, 38 species of them are affected by anything from pathogens to invasive plant species. He referenced the problems of gunnera, rhododendron and Japanese knotweed.

The Pacific oyster is grown in aquaculture, but has escaped into the wild and become invasive, damaging habitats and changing ecosystem processes. There is a need to try and produce sustainable commercial fisheries.

Prof. Montgomery outlined the damage being done by two specific invasive mammals. Where the invasive greater white-toothed shrew becomes established it makes Ireland's smallest mammal, the native pygmy shrew, extinct. It also dramatically reduces the hedgerow and roadside invertebrate communities and the number and abundance of species goes down alarmingly. The invasive bank vole also leads to significant declines in the wood mouse.



An invasive freshwater shrimp species is moving south from Northern Ireland. This invasive species reduces the number of our native freshwater shrimp. As a result, this unique species may become extinct and may change the entire biodiversity of the rivers.

The impacts of invasive species tend to be negative and undermine ecosystem services. Everything from the production of food to human well-being is affected by invasive species of some sort or another.



8.1.6 Freshwater Fish in Ireland – how to protect and restore biodiversity.

Dr Ken Whelan, Fisheries Scientist

Dr Whelan told the Assembly that the limestone portion in the middle of Ireland is where resident freshwater fish live, while the more mountainous areas around the coast are home to migrant species. We have 12,000 lakes and about 73,000kms of rivers and streams, a length that would stretch almost twice around the planet.

Ireland once had 14 species of fish. There are now 29. Quite a number of the non-native species have been here for a very long time and have naturalised. But more recent arrivals are causing problems. He emphasised that the native species rely on 'cold, clear, clean water'.

Freshwater fish are drivers of biodiversity. They're also indicator species, with salmon in particular classified as a keystone species. They are great

natural monitors of what's happening in our rivers, as well as being a valuable recreational resource.

He told the Assembly that we have some of the best legislation to protect freshwater fish, but his experience over 40 years is that it is not being implemented.

Dr Whelan outlined the key pressures on freshwater which provide huge challenges:

- Land management practices, such as straightening or river channels and other works have caused immeasurable physical damage.
- There has been a huge drop in water quality since 2015 when milk quotas for dairy farming were dropped.
- Barriers have been put in the way hindering passage of fish.
- Climate change is increasing the temperature of our waters.
- Invasive species is a big issue in our freshwater.
- The problem of sea lice in areas where we have poorly managed salmon farms.
- The effect on migratory fish from windfarms.

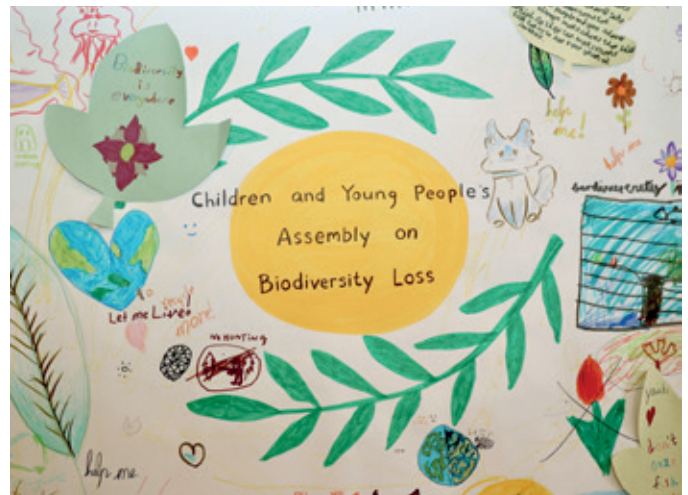
The effects of these on their own or in combination affects 'cold, clear and clean' water and can be disastrous.

There are nature-based solutions to flood relief and flood control but there needs to be a nationally directed and coordinated approach to design. There also needs to be a national committee looking at best practice to ease fish passage. With the help of citizen scientists our pristine waters need to be identified and then protected. We are not even close to understanding and addressing the problem of invasive species while a more varied approach to riverside vegetation, not just trees, is needed to protect and support freshwater biodiversity.

He concluded by reminding members that you are not dealing with a channel; you are dealing with a river - a living entity.

8.2 Children's and Young People's Assembly presented their work.

Members of the Children and Young People's Assembly presented their work which included 55 recommendations. There was also a questions and answers session with the members of the Assembly.



8.3 Marine and Coastal Environments

8.3.1 High-level overview – broader marine biodiversity current status and potential measures.

Richard Cronin, Chief Policy Advisor for the Marine Environment, Department of Housing, Local Government and Heritage

Mr Cronin set out that we live in a blue planet with oceans covering 71% of the planet, absorbing 90% of the excess heat produced by humans and producing about 50% of the oxygen we breathe. Ireland's share is about 480,000 square kms - seven times the size of our land mass.

The sea is a three-dimensional interconnected environment. This necessitates co-operation between countries.



Mr Cronin described our main policy tools. Firstly, through the auspices of the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR convention) - consisting of 15 countries including Ireland. Above that structure, there is one open system based on the United Nations Convention for the Law of the Sea dating from 1982. There is no legal protection for biodiversity outside of these designated areas.

At EU level we have the Marine Strategy Framework Directive and Water Framework Directive. Every six years the EU measures the state of the environment, marine litter, water littering, animal entanglement and ingestion. The measures provide an overall assessment of the health of the marine environment.

Mr Cronin outlined that our biodiversity indicators are not good. These problems are largely historical, driven by society drivers: food, energy, recreation, travel and transportation. Repair of marine biodiversity needs to be long term and consistent, with actions done in cooperation with participation networks. He told the Assembly that the State is on the verge of publishing a new law for Marine Protected Areas, which will considerably increase the number of protected areas. This has huge public support.

He outlined that future challenges are difficult. At present, Ireland is not causing a lot of pollution pressure in the Irish marine environment, but we certainly have coastal problems. He stated that there is much misalignment of policy. For instance, while there is policy for adoption of an ecosystem-based approach, we are incentivizing things like food security and energy without incentivizing nature. There is also a problem of shifting baselines - what we want to protect and restore is gone by the time we get there.

He concluded with a slide that listed the future challenges: sustainability, policy and funding misalignment, social justice, climate change. He said that these are what are known as “wicked” problems – meaning they are sticky problems and hard to unpick. The people asking to fix it, paradoxically, are simultaneously causing it. The easy problems have been solved but now the non-binary outcomes are going to be most important, the cumulative effect of drivers, activities and geopolitics. We need to incentivise nature and to make constant progress without losing sight of the urgency of the issue.

8.3.2 Biodiversity in our oceans – A scientific perspective.

Dr Ciaran Kelly, Director of Fisheries Ecosystems Advisory Services, the Marine Institute

Dr Kelly told members that to the unaccustomed eye the ocean can seem like a huge blue void. The ocean provides at least 50% to 80% of the oxygen that we breathe and absorbs at least 50% of the CO₂ from the atmosphere. It is ‘planet ocean’, not planet Earth.

Ireland has 10 times more seabed than it does land, but that represents only 2% of the North Atlantic to which it is connected. It is like having a very nice garden adjoining a park – the park has a huge impact on your garden, while what you do in your garden impacts on the park.

Issues and solutions in the oceans are not the same as you would have on land. On land there



are food pyramids. But things are much more complex in the marine environment where there are ‘food webs’. This complexity is an important issue as anything we do can lead to unexpected outcomes. Dr Kelly said that shifting baselines caused by global warming are important, but it is not homogenous. It is happening at different rates in different places and some of the changes we are seeing which appear to be climate related are in fact being caused by other factors. So, complexity matters. The Marine Institute is acting with fishers to change fishing methods to avoid capture of vulnerable species in areas.

Dr Kelly summarised that the issues are complex, and we need to focus on where we can be effective. He concluded by quoting Greta Thunberg: “knowledge that your house is on fire is one thing. But it’s of no use to you unless you know how to get out. And once you get out of your house and you manage to put the fire out you’re going to have to realise that the fire has caused some damage or some change to the house. We have to think about that too.”



8.3.3 Voices from the Marine Sector

Sean O’Donoghue, Killybegs Fishermen’s Organisation

Mr O’Donoghue told members that Ireland’s Exclusive Economic Zone is over six times the size of our land area. He noted that the fishing industry is worth €1.2b nationally and the seafood sector provides 16% of coastal employment in County Donegal.

He told the Assembly that healthy oceans and biodiversity are critical for their industry and that fisheries are essential to provide a sustainable food source. There needs to be a balance between socio-economic and biodiversity sustainability. His organisation is very much aligned with Sustainable Development Goal 14 – Life Below Water. This link is critical to their future.

Mr O’Donoghue outlined some of the challenges facing fishers, including the serious impact of Brexit with huge reductions in the catch of mackerel and Dublin Bay Prawns. As well as fishers from other countries not adhering to the rules of the Common Fisheries Policy there are a lot of competing activities and factors such as renewable energy, leisure and shipping and Marine Protected Areas. Everyone needs to be accommodated but there needs to be robust science, consultation and compromise.

Dr Simon Berrow, Irish Whale and Dolphin Group

Dr Berrow told members about the rich biodiversity in the Economic Exclusion Zone of our seas. While we have a responsibility to maintain, conserve and protect this biodiversity, it is also an opportunity. Dr Berrow told the assembly that we need to build knowledge. We need to know where species are and when, what species occur, their health and their habits. We have very little understanding

of historic levels of biodiversity, and we don't know what a pristine environment looks like. Better contemporary knowledge would help inform many activities and policies related to offshore renewable energy, navy manoeuvres, deep sea mining, etc.

He outlined the need to work with inshore communities, in partnership. He emphasised the need to properly manage foraging fish, which are one of the essential marine ecosystem components. We need to work with coastal communities and treat fishers with respect to rebuild stock and restore habitats. He suggested a pilot scheme, similar to compensating farmers for not farming certain areas of land, compensating fishers not to fish certain areas in order to enable ecosystem recovery. He also told members that we need to become an ocean literate society where we all feel like islanders and have knowledge of the waters around us. Without this it will be hard to make progress in restoring the biodiversity around the island of Ireland.



Dr Griffin, Marine Policy Officer, Fair Seas Campaign

Dr Griffin told the Assembly that we know how to halt and reverse biodiversity decline in our seas, while at the same time addressing climate change. The reason that biodiversity decline is still happening comes down to money. The lack of funding is a huge barrier and Dr Griffin suggested that the members' first recommendation should be to properly fund biodiversity protection and restoration. He proposed a figure of €1b from the current budgetary surplus.

Dr Griffin suggested the money should be spent on both the designation and the management of an ecologically coherent network of Marine Protected Areas. He told the Assembly that there should be active restoration of biodiversity with 'boots on the ground' rehabilitating species, habitats and ecosystems.

He concluded by telling the members that it was not too late but there needed to be a sense of urgency and an emergency response.



8.4 Energy Production

8.4.1 Energy production and biodiversity

Prof. Jane Stout, Professor in Botany, Trinity College Dublin

Prof. Stout outlined the impacts of climate change on biodiversity and told members that we need to address climate change without damaging biodiversity.

Forestry needs planting of the right trees in the right place to ensure that it is ecologically sound, economically viable and socially just. In agriculture multispecies swards provide benefits for both biodiversity and agricultural production. Restoration of peatlands is good for the bog and its ecosystems and good for carbon sequestration, but benefits can take a long time.

Prof. Stout outlined the findings of a recent review of potential impacts of renewable energy technologies on biodiversity, while adding that research is ongoing and much is still unknown. Offshore windfarms would only take up a tiny fraction of our marine areas. A potential positive is that they could be co-located within MPAs, but still we do not fully know the impacts of this technology. Potential negative impacts include the destruction and alteration of the seabed, collision injury/mortality for birds and potential damage cause by onshore infrastructure.

Current negative outcomes associated with onshore wind farms include inappropriate siting, habitat loss and fragmentation, displacement of species, and injury/mortality of species. There is currently very little understanding of the impacts on insects. We need to find ways to monitor impacts and mitigate negative outcomes. On the positive side wind farms could assist in the restoration of habitats and could be co-located on intensively farmed land.

Generating energy from solar power is beginning to expand in Ireland and is an area that we need to understand better. Potential negative impacts include habitat loss, creation of microclimates, water pollution and the use of herbicides to control plant growth. However, there may be the opportunity for lots of solar panels in built

up areas, where areas under panels could be functional urban spaces.

Bio-energy, plants grown specifically to cut and burn as fuel, may not have a positive climate change impact and has potential to damage biodiversity if located on high nature value farmland.

She concluded by telling members that the relationship between climate change and biodiversity loss is complex, we are in crisis but no one size fits all.



8.4.2 Voices from the Energy Sector

Dr Val Cummins, Operations and Projects Director, Simply Blue Energy Group

Dr Cummins described the concept of floating offshore wind, the benefits, the potential impacts and opportunities for the environment and for ecosystems. She explained that floating offshore wind technology differs from the traditional technology that involved piling into the seabed in waters around 30 metres deep. Floating offshore wind goes into much deeper waters (60-80 metres deep and usually over the horizon as seen from land). The turbine is secured to the seabed by a system of moorings and anchors.

The State has set a target of 30 gigawatts of floating offshore wind from the west coast. As one gigawatt would power roughly one million

homes this would allow us to reach our climate change targets as well as export energy. The installation techniques and methods for these are less invasive than piling. The industry is looking to deliver 6.5 gigawatts by 2030 which would create approximately 13,000 jobs.

Simply Blue Group is developing two floating offshore wind projects – 35 km off the coast of Cork and 35km off the Clare coast.

She reported that the ecosystem impacts of floating offshore wind has been examined specifically under certain outcomes:

- Dampening of wave energy in and around floating devices could potentially provide enhanced areas for foraging fish.
- Collision risks for seabirds would be lessened because the floating platforms are further from the shore and the blades much higher from sea level.
- The floating platform could present a structure amenable to species colonisation.
- As areas around the platforms would not be available for trawler fishing they could be designated as marine protected areas.

Pat Smith, Managing Director, Local Power Ltd.

Mr Smith began his talk by telling the members that as hunger threatens 800 million people globally today and the world population is set to grow to 10 billion by 2050 the primary function of farmland must be to produce food. Agriculture, however, is intimately interlinked with both the renewable energy sector and biodiversity.

He suggested that Ireland's policy direction must provide long term sustainability both environmentally and economically. Mr Smith said over 95% of the land area under solar farms are accessible for plant growth and wildlife enhancement. There are well-documented biodiversity guidelines for solar farm developments and planning applications that include measures for the enhancement of

biodiversity. He also posed the question: why take good agriculture land away from food production for renewable solar generation when other options are available?

Over 25,000 acres of roof space on farms and businesses across the country could accommodate distributed solar PV energy generation¹³ and provide enough renewable energy to power 500,000 homes.

Anaerobic digestion¹⁴ is already used to generate biomethane to assist meeting renewable gas requirements. An Bord Gáis have an ambition to deliver 30% of its gas from renewables in the next 10 years. The same digestion process generates a natural CO₂ – a product used by the drinks and food industry - while also producing a soil enhancing biofertilizer. There are already many hundreds of AD plants built in Europe with government supports. There is similar opportunity here.

Wind is a natural resource we have in abundance. We could encourage the development of dedicated one-off turbines on land to support energy-intensive businesses.

Mr Smith concluded by saying that competing forces – food, energy, biodiversity – need to listen to each other, come to decisions and take actions for a sustainable future.



¹³ Solar panels that produce electricity are known as solar photovoltaic (PV) modules. These panels generate electricity when exposed to light. Solar PV is the rooftop solar seen on homes and businesses. Solar panels that produce hot water are known as solar thermal collectors or solar hot water collectors.

¹⁴ According to the American Biogas Council, "Anaerobic digestion is a series of biological processes in which microorganisms break down biodegradable material in the absence of oxygen." The products of this process are biogas, liquid digestate, and solid digestate.

8.5 Urban and Built Environment

8.5.1 High-level overview – Planning and Biodiversity in our Urban/Built Up Areas

Dr Michael Lennon, Associate Professor of Planning and Environmental Policy, University College Dublin

Dr Lennon began his presentation by outlining that the reason we should consider biodiversity in urban planning is that we share these spaces with plants and animals. And in order to do this we need to have an understanding of planning. Biodiversity in an urban setting is up against many competing challenges: housing, regeneration, flood management, retail, transport, etc.

He told members that there are five aspects to successful planning for biodiversity:

- i. A solid legal framework for proactive biodiversity enhancement.
- ii. Evidence-informed policy (e.g. in county/city development plans).
- iii. Activities by local authorities on their lands (e.g. pollinator planting in urban parks) and by other state bodies in urban areas (e.g., the Office of Public Works regarding flood prevention).
- iv. How decisions on planning applications are made. This is called development management.
- v. Enforcement of planning decisions.

Dr Lennon told members that each of these aspects is currently weakened to differing degrees by the lack of a dedicated legal framework for proactive biodiversity enhancement, a lack of expertise in local authorities, a lack of financial resources in local authorities and poor enforcement.

The emergence and integration of a 'Green Infrastructure' approach to planning over the past decade has helped redress some of these long-standing issues. This is being integrated with national, regional, county and local plans in Ireland. This looks at green spaces as infrastructure in the same way as other infrastructure, e.g. transport, and that these green spaces should provide multi-functional benefits including heat mitigation, drainage management, biodiversity, recreation, mobility and the provision of community spaces.

Some innovations in other countries include UK Biodiversity Net Gain, coming into force in 2023. This will provide for a net gain of 10% in all new developments so that now development will increase biodiversity. In New Zealand they have adopted an approach of heavily resourced enforcement.



8.5.2 Nature-based solutions in urban environments, biodiversity & human perspective

Dr Marcus Collier, Associate Professor of Sustainability Science in the School of Natural Sciences, Trinity College Dublin

Dr Collier outlined that the concept of Nature-Based Solutions looks to draw on nature's vast resources for solutions. Solutions that are inspired and supported by nature are cost effective and have environmental, social and economic benefits and build resilience in systems.

Dr Collier then gave examples of nature-based solutions and their potential in urban environments. Green roofs provide a variety of functions including insulation, water attenuation, noise and glare reduction, the capture of carbon and dust, as well as biodiversity by providing habitats and steppingstones between habitats (although the type of plants is often not of high biodiversity value).

Another example is living walls, which consist of plants growing on the exterior walls of buildings. Again these provide very good insulation, as well as being aesthetically pleasing. He also showed Irish examples of incorporating nature-based solutions into ordinary structures.

Dr Collier told the members that 70% of the global population will live in cities by 2050 and that one third of these will live below the poverty line. The only real contact these people will have with nature will be in their urban neighbourhood. Therefore, nature in cities will become increasingly important. There are plenty of spaces for nature in cities and increasing demand from society and communities for nature in new developments. There are currently 35 EU projects on Nature-Based Solutions, with Irish universities being partners in some.

Dr Collier concluded by saying that there are many co-benefits to greening our cities including increasing biodiversity, reconnecting people with nature and improving quality of life.

8.5.3 A Green Future in Utrecht

Jeroen Schenkels, Green Advisor, City of Utrecht, Netherlands

Mr Schenkels introduced the city of Utrecht as a compact city of 360,000 people with a large student population and with an ambition to be a Green and Healthy city, even as it looks to grow by 100,000 people by 2040. This involves the challenge of making sure the city stays green and healthy across all areas. This will be underpinned by what he described as 'building with nature', with an extra 440 ha of green space added for every additional 40,000 of population.

He outlined for members how Utrecht is using solutions that match the natural systems. For example, they are monitoring 30 key species to check the health of the natural system and are including obligatory measures in new developments, such as bird and bat boxes, the provision of habitats such as 30 nest boxes per ha. and a minimum of 100m² of vertical green per ha, etc.

Mr Schenkels illustrated multi-functional green roofs on bus shelters, the greening of inner-city high-rise developments (internally and externally) and the need to raise awareness among the public about biodiversity.



8.5.4 Urban Voices

Hans Zomer, CEO, Global Action Plan

Mr Zomer introduced Global Action Plan as an environmental behaviour change organisation since, in order to influence change, we need to understand the psychology of behaviour. He noted that policy change tends to focus on awareness raising, education and knowledge, but the tricky part is the motivation. Biodiversity actions can be invisible to many, so the incentive to change remains small and those who want change feel isolated. This is referred to as the values perception gap where “we end up in some sort of spiral of inaction.”

Mr Zomer informed members about the Green Living and Sustainable Community Garden in Ballymun. Working with Dublin City Council and the community in Ballymun, the programme aims to build greater connections between people in the community and their built-up environment. Ireland is a little behind the curve in terms of community gardens (there are over 100 nationwide). The community garden in this programme engages with individuals, schools and businesses operating as a hub for learning and social inclusion. The objectives of the programme are to demonstrate that green living is possible.

Mr Zomer told the assembly that Fingal County Council now aims to replicate this unique social inclusion horticulture program in West Dublin.

Dr Paul Holloway, Geographic Information Systems and Spatial Ecology, UCC

Dr Holloway outlined the Cork Urban Biodiversity study, which used satellite imagery to map the extent of habitats within Cork City. The results showed that, for a snapshot in time, these hidden and community spaces comprise a large amount (66%) of green space in the city. Where there was more green space there was more biodiversity and where there was more blue space (water) there was a decline in biodiversity. Areas with combinations of green and blue spaces contributed most.

He informed members that ongoing citizen science or community data projects have helped estimate when migrant birds are arriving, when insects are emerging and when vegetation is greening. He outlined that there is a correlation between greening of vegetation and emergence of insects, but the



birds are arriving before a lot of their insects have emerged which may break the food web. That finding might mean that the international 'No Mow May' awareness campaign that has developed in recent years should now start earlier.

Dr Holloway told the assembly that there is less information about when the birds leave, which would be useful in a global context. To meet this gap, UCC provided technology and training for older people to collect data. This has contributed to data, but also increased well-being of the participants and has also provided evidence that people have changed their behaviour in their gardens based on what they are learning through the technology. These behaviour changes have resulted in an increase in biodiversity in these local and private gardens, which feeds back into the important spatial network in the overall city.

Ricky Whelan, Project Manager, BirdWatch Swift Project

Mr Whelan gave an account of his work with the BirdWatch Swift Project, by introducing the charismatic swift which spends about 10 months of the year in constant uninterrupted flight. These birds breed, sleep, mate and feed on the wing, and can fly 110km per hour. However, he informed members that swifts are on the red list and in danger of extinction.

Swifts have declined by 58% between 1998 and 2016. The reasons for this are not clear. They are fledging less young over time, because it is harder to get enough food for a nest full of chicks. 90% have moved into urban areas. They nest in cracks and crevices on the roof tiles on roof plates but, with so much insulation in houses now, there is often nowhere for them to go. In addition, there are climate and biodiversity related problems meaning they cannot get enough food.

There are many commercially available nest boxes and nest bricks to replace lost nesting places for swifts. Mr Whelan showed examples of where swift boxes and bricks had been effectively placed e.g. Castlebar Leisure Centre and Portlaoise Library.

Mr Whelan told members that it is vital to protect the existing swift populations and avoid local or regional extinctions. He outlined that major gains can be brought through the planning process by including swift bricks stipulations in planning consents (such as Loais Co, Offaly Co, etc.) and, while there are conflicts with retrofitting schemes for energy, these are not insurmountable.



9

Summary Content of Meeting 5: 26-27 November 2022



The following is a summary of the meeting held on the weekend of 26-27 November 2022; a video record of the meeting, including presentations, plenary sessions and Q&A, is available on the Assembly's website at:

<https://citizensassembly.ie/citizens-assembly-on-biodiversity-loss/meetings/26th-27th-november-2022/>

9.1 What is the value of Biodiversity?

Prof. Jenny McElwaine, TCD and member of the EAG

Prof. McElwaine gave a short presentation to the members bringing them back to the basic themes of the first meeting held in Dublin Castle in May. What is biodiversity loss? Why is it important? She told members that the death of nature, the extinction of species, means the death of nature experience for humans. She reminded the members of what members of the Children and Young People's Assembly had said, biodiversity should be treated like a member of the family.

She reminded the members of the ecosystem services provided by biodiversity – not just food, water and air but also carbon store, medicinal and technological values, and cultural and artistic values. She concluded by telling the members that when we lose biodiversity, we lose potential future remedies for human ailments and illnesses that we have not had a chance to discover.

9.2 What is Industry doing and how can they engage with Biodiversity?

Lucy Gaffney, Platform Development Manager, Business for Biodiversity

Ms Gaffney began by telling the members that the gap between ecology and economy needs to be bridged and that climate change and biodiversity loss must be addressed together.

There is a strong relationship between business and nature. She explained that we need to understand and address the issues relating to how business and industry put pressure to the five drivers of biodiversity loss. Businesses also need to understand why they should care about biodiversity. The business case for investing in nature is that nature underpins everything. Our economic value is derived from nature, nature is where wealth comes from, where huge business profits come from. She told the members that we have extracted, harvested and stripped natural assets and created immense value for companies. But this profit does not get recycled back to where the wealth originated from. Quoting an, as yet, unpublished European report she informed members that 92% of funding for nature restoration comes from public funds, with just 8% from private. She told members this needs to change.

She introduced the online platform 'Business for Nature' which aims to have businesses assess their impact on nature, understand their dependence on nature, mobilise funding for investment in nature and bring nature into decision making at every level. Businesses need to transform how they engage with nature in order to become nature positive.

In Ireland 'Business for Nature' are building capacity of businesses in this area by educating businesses, by creating a scoring system to measure actions and by creating an investment-ready nature remediation portfolio.

She concluded by telling the Assembly that they would like to see mandatory disclosure of nature-related risks from businesses, that would outline their impacts and dependencies. This information is needed to make better choices.

9.3 Industry Voices

Stephen Nolan, Managing Director, UN Development Programme Financial Services for Sustainability

Mr Nolan outlined that the United Nations Development Program is the largest UN agency with 17,000 staff, based in 140 offices around the world covering 160 countries.

Mr Nolan told the Assembly that as biodiversity is a world issue, so too is biodiversity finance. Sustainable finance needs to unlock capital for both OECD and emerging economies. Ireland is doing a lot in this area including the production of the first Sustainable Financial Roadmap due in January 2023. This will contain 18 actions to promote and position Ireland as a leader in sustainable finance including the establishment of a Sustainable Finance Centre of Excellence in Ireland.

He told members it is estimated that \$700bn will be needed each year to 2030 to address biodiversity loss – this is 1% of global GDP. Sustainable finance is essential for this to be achieved. He told the members that climate change had been the main focus of finance previously. Biodiversity is a new area which there has been a significant increase in interest in the last two years. The World Economic Forum estimates that \$44tr of global output is at risk due to the decline in world ecosystems. But there are also opportunities with an estimated \$10tr of economic activity and 395m jobs potentially being made available through climate and biodiversity transition.

Biodiversity finance needs to be nature positive and private finance needs to provide 90% of the biodiversity funding target. He told members that regulatory agenda will be key with central banks ensuring that biodiversity risks are managed. This will be an important tool.

Mr Nolan concluded by telling members that an Irish report on biodiversity finance and risks and opportunities is due to be published and that hopefully Ireland could become a leader in biodiversity finance in the years to come.

Deirdre Ryan, Director of Origin Green Programme, An Bord Bia

Ms Ryan outlined that An Bord Bia is the Irish state agency responsible for marketing Irish food and drink abroad. Irish food exports are worth over €13 billion annually - 90% of what we produce is exported. It is an important economic sector and one that is hugely dependent on ecosystems while also having an impact on those ecosystems.

Under Origin Green and assisted by Teagasc they collaborate with 55,000 farmers on farm sustainability assessments. A variety of sustainability issues, from energy to animal welfare, are covered and biodiversity is one of these. They provide feedback and advice as well as providing other supports. Carbon is the main issue and emphasised the co-benefits between climate and biodiversity actions.

An Bord Bia provides tools in the form of e-learning around soil health, water quality in co-operation with other state agencies. It sponsors the Farming for Nature Awards and collaborates on projects such as the BRIDE project but scaling these up is the challenge.

Ms Ryan told the members they work with 300 food and drink companies to help them understand the impact of their activities and establishing five-year sustainability plans setting targets around raw material sourcing, packaging, etc.

Of the 300 company members 81 have biodiversity targets with over 500 initiatives in place. An Bord Bia also has a biodiversity officer to support along that journey.

Concluding Ms Ryan told the Assembly that sustainability is both a national and international issue and that collaboration is critical.

Shane Dineen, Environment and Planning Manager, Fáilte Ireland (FI)

Mr Dineen outlined that Ireland has a unique tourism product which relies on nature, while being aware that tourism can have a negative effect on that environment. He told the members that tourism and biodiversity are intrinsically linked and outlined a variety of their initiatives and projects to protect the environment.

FI includes environmental assessments of all its tours and plans and projects and undertakes associated monitoring and working with partners and site operators on visitor management and master plans for key tourism sites. They also have a National Tourism Monitoring Programme covering 19 sites for five years looking at stresses and risks, as well as good and bad practices and making recommendations. Mr Dineen told the members that in order to receive FI funding applicants needed to demonstrate compliance and best practice with measures related to sustainable development and environmental protection. FI is also a partner on two EU LIFE projects where they work with farmers, local communities and landowners in designated areas.

The Assembly were told that FI has developed sector guidelines to meet climate change goals and reduce carbon footprint in areas such as energy efficiency, better water and food management systems. This also includes a biodiversity guide for businesses to support them and enhance biodiversity.

Mr Dineen concluded by telling the members that collaboration is important and that tourism must play its part. The new National Sustainable Tourism Policy will support the National Biodiversity Plan as well as the recommendations of the Assembly.

Ian Talbot, Chief Executive, Chambers Ireland

Mr Talbot told the members that Chambers Ireland has 38 affiliated chambers on the island with over 10,000 members. They are a geographically based organisation covering a range of sectors across their membership.

Mr Talbot told the members that something we need to get better is implementation. Implementation is critical.

Chambers Ireland concentrate on 5 of the Sustainable Development Goals, particularly climate action and sustainable cities and communities. He discussed a number of issues and challenges relating to water, the need for infrastructure, for instance flood management, and the negative effect it can have on biodiversity, as well as the generation of electricity. People do things with good intentions, but that do not always work out well for biodiversity.

98% of our economy are small and medium sized enterprises. Chambers Ireland have produced a Sustainable Development Goals tool kit for its members, they have Sustainable Business Impact Awards and they work with Skillnet Ireland.

Mr Talbot told the members that business needs a starting point but it takes time, is costly and complex and there is uncertainty around quantifying carbon emissions. It is important that they understand how their actions fit into the bigger picture. Business understand the urgency but need help and encouragement to understand where and how their actions can fit in.

He concluded by telling members that we need to address the issue of lethargy. This could be 'stick', 'carrot' or regulation. But we also need enforcement.



Codie Preston, Science and Biology secondary school teacher and Irish Schools Sustainability Network (ISSN)¹⁵

Mr Preston told the members that the provision for nature in our education system is wholly inadequate. We need to provide meaningful nature education that gives students a deep knowledge, an understanding of the causes of the problems, a positive attitude towards nature, an ability to see nature as integral to social economic and health outcomes and, very importantly, provide students with opportunity to start to see themselves as part of nature.



He told the members that there is a dearth of knowledge in the education system about biodiversity, both among teachers and students. Existing education policies and curricula are not adequately addressing the issue.

There is a lack of proper training and continuous professional development for teachers. There is no provision for creating any type of outdoor education spaces in existing schools. The primary school curriculum has subsumed nature into science, which has meant the loss of educational tools like the common nature table. In secondary school nature education is pretty much non-existent except for a small section of science and biology courses. He identified the need to educate our teachers, leaders, school leaders and principals, but by not including it in the formal system we are telling people that the subject is not important. He shared with members quotes from young people on their ideas and ambitions to tackle both the climate and biodiversity crises.

He told members that nature should not only be taught in classrooms. School grounds can be important educational resources where children can engage with nature. While all future schools will have spaces for nature there is no requirement for existing ones. These need to be resourced and funded, with people on the ground to look after the spaces. For schools that do not have space, partnerships could be developed with community groups, government educational organizations and local authorities to create outdoor classrooms in our parks. He emphasised the positive role that local authorities could play by providing outdoor education spaces in urban parks.

In terms of models, a school in Waterford has recently invested heavily in a large outdoor planting area, are developing an environmental leadership development program and have secured funding for a part-time permaculturist.¹⁶

Mr Preston told members that nothing will change unless the Department of Education and Skills treats the issue of biodiversity as an emergency. In 2019 the government declared a biodiversity emergency but there is no sign that the Department sees this area as an emergency or even a high priority.

He concluded by telling members that if we embed nature into our educational system future adults will not make the same kind of previous mistakes. We owe it to our children to give them the proper education that they need to be able to protect the environment. We also owe it to nature.

¹⁵ ISSN is a grassroots network of teachers and students formed in recent years.

¹⁶ Permaculture can be understood as the growth of agricultural ecosystems in a self-sufficient and sustainable way.

Dr Jane Goodall, Primatologist, Anthropologist and Environmentalist, Jane Goodall Institute

Dr Goodall joined the Assembly by remote video link. She began by telling the members that we are part of the natural world and are dependent on it for food, water, air. We depend on healthy ecosystems. She first learnt of ecosystems when she began her work with the chimpanzees in 1960 Gombe in what is now Tanzania. Everything was interconnected; each plant, each animal, no matter how large or small had a role to play. An ecosystem is like a beautiful tapestry. If one animal vanishes it's like pulling a thread from the tapestry. If we pull enough the tapestry will be in tatters, the ecosystem will collapse.



She discussed the main drivers of biodiversity loss. These included habitat destruction from development, roads, dams, mining, etc. as well as the effects of agriculture, with huge areas of land dedicated to feeding animals. There is also the pollution of our rivers, streams and land with agricultural chemical pesticides causing damaging loss of biodiversity. Light pollution is causing insect decline and, in other parts of the world, there are hunters killing endangered wildlife. There are also invasive species and climate change.

Dr Goodall drew particular attention to the causal issue of poverty. By way of example she spoke about returning to Tanzania to find the hills denuded of what had previously been lush forest, as people destroyed the habitat in order to live. She told the members that we need to find ways for people living in these areas to earn money by other means or we will have no hope.

Turning to more hopeful considerations she gave an example of community led conservation in which non-specialists work with communities to assist them to meeting their needs. Activities include restoring fertility to the land and working to promote health, education, micro-finance and family planning. As a result of this work nature has been transformed. The resilience of nature is our best hope. Through projects like this it becomes clear that protecting the environment is not just for wildlife, it is also for their future. This community led conservation work is now in over 100 villages in Tanzania and in 6 countries.

Dr Goodall told the assembly of species that have been brought from the brink of extinction, as well as transformative rewilding projects. However, she warned about people working in narrow areas and focusing on solving only their own problems. She cited renewable energy projects damaging biodiversity and talked about having to retrofit solutions to reduce deaths of birds and bats. She also stressed the importance of providing biodiversity in our cities, and especially for those in inner cities, so that they can get the physical and mental benefits of interacting with nature.

She concluded by saying that her greatest reason for hope was young people. Once young people understand something and are empowered to undertake action they can and do change the world. She told the members about the impact of the present and past members of the 'Roots and Shoots' organisation that she established in 1991 and is now in 66 countries. The young generation are our hope by what they do now, but also what they will do when they become adults. That is the hope for the future. And we need hope.

Appendices



Appendix 1: Invitation letter to households to participate in the Citizens' Assembly on Biodiversity Loss



Taoiseach Micheál Martin TD,
invites you to take part in a Citizens' Assembly to
consider how best Ireland can deal with the important
issue of Biodiversity Loss.

**"What humans do over the next 50 years will determine the fate of all life on the planet."
David Attenborough**

This invitation provides a unique opportunity for you to make an important contribution to a pressing issue facing Ireland, the Loss of Biodiversity.

Biodiversity is short hand for all life on earth.

Citizens' Assemblies have become an important part of the Irish democratic process with previous Assemblies making recommendations on Marriage Equality, Climate Change, Gender Equality that have already made significant changes to the way we live.

Dáil Éireann and Seanad Éireann have established this Citizens' Assembly to consider the Irish State's response to the crisis of Biodiversity Loss and make recommendations for action.

You have been randomly selected from the population of Ireland to receive this initial invitation. If you accept you will be included in a further selection process to create an Assembly of 100 people representative of Irish society.

Members of the Assembly will be asked to spend 5 weekends (all day Saturday, Sunday mornings) between April and the end of the year listening to national and international experts, interested parties and others. You will have the opportunity to discuss, question and share views with fellow members in order to reach informed and consensus-style recommendations for the Oireachtas.

Accommodation and meals will be provided, as well as out-of-pocket travel expenses. Members of the Assembly will receive a nominal honorarium to the value of €500 at the conclusion of the Assembly in recognition of their public service contribution.

How to Register

If you are in a position to accept this invitation please register on the Citizens' Assembly website www.citizensassembly.ie/register.

If you encounter any issue with registering your interest online (or prefer to register by phone), please call (01) 619 4111.

Please use this ID number

when registering.

This invitation is addressed specifically to your household and is open to any adult aged 18 years or over. Serving politicians and registered lobbyists are not eligible for this selection process.

Privacy: Our privacy statement and how we will handle your personal information can be viewed at www.citizensassembly.ie/privacy.



Appendix 2: Details of the submissions process/public consultation

A public consultation process was launched in April 2022. This enabled members of the public, as well as stakeholder groups and representative organisations, to make written submissions to the Citizens' Assembly.

The process ran between April and November 2022, during which time 647 valid submissions, from Ireland and around the world, were received. This included 508 submissions from individual members of the general public and 139 submissions from representative organisations and stakeholder groups. Members of the Assembly were provided access to each submission and, in the majority of cases a brief summary of the submission was provided, allowing members to review each submission as soon as it was available.

All valid submissions were subsequently published on the website and remain available to view online on www.citizensassembly.ie.

Appendix 3: Results of the ballots on recommendations

The results of the in-person vote taken on 27 November 2022 and the e-voting undertaken 23 - 30 January 2023 are shared below. Recommendations agreed by consensus at meetings are not recorded here. In cases where results do not tally to exactly 100% this is due to the rounding off of decimal points and does not materially affect the result.

Strategic Approach to Biodiversity Loss		Support	Do not support	No response
22	There should be a senior ministerial position, with an associated department, with responsibility for biodiversity.	83%	16%	1%
23	There should be a permanent, cross-party Standing Oireachtas Committee on Biodiversity Loss, which will consider and respond to the recommendations of this Assembly, within 6 to 12 months.	92%	7%	1%
24	There should be a new national independent agency to act as a centralised biodiversity coordinating structure to:	96%	4%	0%
	i. (a) Coordinate government departments in their biodiversity-related actions;	89%	n/a	11%
	i. (b) Co-ordinate government policy and ensure the coherence of those policies;	94%	n/a	6%
	ii. Coordinate budgets related to biodiversity actions;	78%	n/a	22%
	iii. Drive consultation around biodiversity actions;	72%	n/a	28%
	iv. Oversee and coordinate enforcement organisations;	85%	n/a	15%
	v. Implement, monitor and report biodiversity actions transparently;	89%	n/a	11%
	vi. Oversee education and public engagement related to biodiversity;	89%	n/a	11%
	vii. Oversee and coordinate research and data collection;	91%	n/a	9%
	viii. Act as a point of contact for members of the public and industry to liaise with supports related to biodiversity conservation and restoration;	89%	n/a	11%
	ix. Act in alignment with the Climate Change Advisory Council.	80%	n/a	20%
	x. Set up an Emergency Task Force	70%	n/a	30%
28	All citizens should be empowered with 'legal standing' to protect nature and biodiversity in court.	77%	21%	2%

The Constitution		Support	Do not support	No response
31	There should be a referendum of the people to amend the Constitution with a view to protecting biodiversity.	83%	17%	0%
The proposal to amend the Constitution should include:				
31 a.	Human substantive environmental rights, e.g. a right to a clean, healthy, safe environment; a right to a stable and healthy climate; rights of future generations to these or other environmental right.	82%	1%	17%
31 b.	Human procedural environmental rights, e.g. the Aarhus rights regarding access to environmental information, public participation in environmental decision-making and justice in environmental matters	77%	5%	18%
31 c.	Substantive rights of nature, recognising nature as a holder of legal rights, comparable to companies or people e.g. to exist, flourish/perpetuate and restoration if degraded; not to be polluted/harmed/degraded.	74%	9%	17%
31 d.	Procedural rights of nature, e.g. to be a party in administrative decision-making, litigation, etc. where rights are impacted/likely to be impacted.	78%	4%	18%

Resourcing the State's Approach to the Biodiversity Crisis		Support	Do not support	No response
34	Ireland's Well-being Framework should be modified so that it more accurately measures economic, social and environmental progress in Ireland, with the metrics reported alongside GDP as an indication of how well Ireland is doing and be given a strong role in shaping policy and informing the annual budgetary process.	94%	4%	2%
35	There must be a comprehensive review of current and future taxation and levy policies, regulations, and incentives to assess their impact on biodiversity.	92%	5%	4%
43	New sector-specific levies/charges on harmful imports must be introduced and ringfenced for biodiversity.	83%	13%	4%
43 i.	New sector-specific levies/charges on agricultural exports must be introduced and ringfenced for biodiversity.	66%	31%	2%
43 ii.	New sector-specific levies/charges on retailers must be introduced and ringfenced for biodiversity.	65%	31%	4%

Accountability & Compliance in Biodiversity		Support	Do not support	No response
46	All penalties for any breach of pollution or environmental legislation/regulations should be increased to meaningful economic levels reflecting all damage caused, plus enforcement and restoration costs, with criminal sanction where necessary.	95%	5%	0%

Public Engagement, Education & Awareness		Support	Do not support	No response
59	There should be mandatory and ongoing biodiversity training provided for any civil or public servant whose work impacts on wildlife and biodiversity.	95%	4%	1%

Agriculture		Support	Do not support	No response
74	Current State policy on the management of biodiversity on agricultural lands is not sufficient and requires fundamental review and change to support and incentivise farmers and landowners to protect and restore biodiversity.	99%	0%	1%
75	The Government must ensure that Ireland's food production is in line with commitments to the Agenda 2030 Sustainable Development Goals, the Paris Agreement, the EU Green Deal and current legal obligations to protect biodiversity, genetic resources (e.g. seed diversity) and water quality. It must phase out all environmentally harmful subsidies in the agricultural and food sector.	90%	9%	1%
76	Government departments, State and Semi State agencies shall ensure their work is done in a way which ensures collaborative planning, consultation in decision-making, and implementation with farmers, local authorities and community groups. This must be underpinned by acknowledgement that there is a need for local responses to local environments. (The Burren Programme and the BRIDE projects provide potential templates.) Community led, peer-to-peer farming initiatives must maintain their community-led ethos once they are rolled out nationwide.	99%	0%	1%
77	Biodiversity targets in national schemes (i.e. CAP/ACRES) must be made significantly more ambitious, detailed and focused on the medium to long-term. Funding must be increased to support this ambition.	91%	6%	2%
78	Public incentives and payments for farmers must not restrict them in their ambition to make change for the benefit of biodiversity. All biodiversity incentives for farmers shall be results-based over the whole farm, with farmers who protect and enhance biodiversity rewarded and paid for the ecosystem services they contribute.	98%	1%	1%
79	Increased access to agri-environmental and payments-on-results schemes must be available to all farmers with commensurate funding.	96%	2%	1%
80	The State must support community leadership, and peer-to-peer support in order to share knowledge and assist local farmers and communities to understand and replicate good biodiversity practice.	98%	0%	2%

81	The State must further subsidise and incentivise organic farming and locally grown produce. Sufficient resources must be deployed to support an ambitious implementation of Ireland's Strategy for the Development of the Organic Sector for the period 2019 to 2025, to ensure a more supportive environment for the development of organic food and farming in Ireland, and for subsequent policies relating to the medium to long-term development of the sector.	91%	9%	0%
82	Bord Bia must significantly increase the promotion of the organic farming sector in Ireland and actions supporting the Farm to Fork strategy.	89%	9%	2%
83	People must be encouraged to consume a more plant-based diet.	60%	39%	1%
84	Biodiversity awareness and education training programmes need to be instigated and improved across the agriculture sector, including for farmers, advisors, policy makers, food processors and retailers.	96%	1%	2%
85	The Green Cert must be adapted by increasing the proportion of credits for sustainable farming. Modules should include the identification and management of nature/biodiversity features on farmland, combining latest scientific information and traditional knowledge, recognising and preserving skills built by generations of farmers.	98%	1%	1%
86	Offer incentives through agri-environment schemes to farmers that achieve high soil quality status, either from the start of the monitoring programme or as a result of their employing remedial measures.	96%	0%	4%
87	In line with EU Soils Strategy, a National Centre for Soil Science must be established based on up-to-date technology where soil testing of physical, chemical and biological properties of soil is subsidized for farmers.	96%	4%	0%
88	The State must require sufficient information on commodity labelling and menus to improve consumer understanding of the origin of their food and the impact of their choices on biodiversity/environment.	83%	16%	1%
89	More farms and farmers must be encouraged and rewarded for adopting the Silvopasture approach to farming – planting native deciduous trees in amongst pasture lands.	96%	2%	1%
90	Encourage use of multi-species mixtures and phase out use of monoculture grass seed mixtures.	98%	0%	2%

Freshwater		Support	Do not support	No response
91	The management of our freshwater systems requires immediate action. It requires increased level of ambition, increased resources for Water Framework Directive implementation (and therefore aquatic biodiversity protection and mitigation), a focus on water quality and aquatic biodiversity outcomes, clarity on roles and responsibilities and accountability for achievement of the outcomes.	98%	1%	1%
92	The State must provide a single body to oversee and co-ordinate the many relevant bodies that manage, implement, and enforce legislation and policies relevant to freshwater.	94%	5%	1%
93	There must be urgent increases in investment by Irish Water to build new, and improve existing, water treatment plants to prevent the unacceptable discharge of raw or partially treated sewage into any fresh or marine waters. The current timelines and targets are inadequate.	100%	0%	0%
94	The management of water catchment areas must be greatly improved, with assessments of water quality to be updated regularly to guide action on restoring water quality.	99%	0%	1%
95	Riparian buffer zones, related to agriculture, forestry, industry and extractive processes and urban development, must be expanded and take into account local conditions to prevent nutrient and sediment run-off. Schemes must be put in place to incentivise landowners to protect waterways, with incremental subsidies depending on the width and quality of buffer zones.	96%	4%	0%
96	Local and other relevant authorities must be held responsible for maintaining and improving the conditions of rivers in their areas, working with each other and State agencies, such as OPW, Coillte, the Department of Agriculture, Food and the Marine, Inland Fisheries, industry, farmers, private landowners, community groups etc. Furthermore, local authorities and landowners must maintain the highest standards to riparian zones along the rivers in their areas.	100%	0%	0%
97	It is imperative that penalties for polluting freshwater are significantly increased and enforcement considerably improved.	96%	4%	0%

98	Farmers must have access to continuous training and up to date research in actions and land management practices that protect freshwater biodiversity.	99%	0%	1%
99	The State must increase support for community groups and NGOs that are working on key projects to improve freshwater systems – e.g. support for Irish Rivers Trusts, Group Water Schemes, angling and community groups.	95%	4%	1%
100	The 1945 Arterial Drainage Act is no longer fit for purpose and must be reviewed and updated in order to take proper account of biodiversity and the climate crisis.	98%	1%	1%
101	Nature-based solutions must be included in State and community programmes to tackle flood management and should include whole of catchment area hydromorphology planning and restoration.	99%	0%	1%
102	The Environmental Protection Agency (EPA), supported by Inland Fisheries Ireland and an expert group, must conduct a complete analysis and survey of all Catchment areas to develop a National Hydromorphology Plan.	98%	1%	1%
103	Motorway attenuation pools must be more widely used and incorporate the use of biodiverse wetlands. The forestry and extractive industries must have the highest standards of attenuation pools and sediment traps applied to their drainage activities.	95%	2%	2%
104	Soil sealing poses a growing threat to our waterways and hydromorphology through surface water run-off. New regulations must be developed to limit the permissible area of soil sealing around all new buildings and other developments that are subject to planning. All other surface finishes must be made of permeable surfaces.	98%	2%	0%

Marine & Coastal Environments		Support	Do not support	No response
105	The State shall designate and effectively manage an ambitious network of Marine Protection Areas, in line with EU targets of 30% of Ireland's Maritime Area, by 2030.	96%	2%	1%
106	The State shall create a National Marine Biodiversity Coordination Body to have responsibility for the implementation of Marine Protected Areas, the achievement of Good Environmental Status, and wider marine conservation and restoration initiatives.	95%	4%	1%
107	The State must implement ambitious marine conservation measures under the Marine Strategy Framework Directive to ensure 'Good Environmental Status' for Ireland's seas.	96%	2%	1%
108	A proportion of funds raised by the State through fines and levies for activity in the marine environment must be used for the protection and restoration of marine biodiversity.	95%	2%	2%
109	The State must act to ensure fish stocks in Irish waters are well managed through quotas, monitoring and no fish zones, supporting income transition for fishers who will need to change their way of earning as policies on Marine Protected Areas and offshore energy evolve, for the necessary conservation and restoration of biodiversity.	95%	4%	1%
110	As a matter of urgency, the State must increase actions and legislation to considerably reduce single use plastics and microplastics to minimise pollution within its waters and along its shores.	98%	2%	0%
111	The siting, development and construction of energy generation at sea (both pylon and floating) must be done in close collaboration with the fishing community and relevant marine biodiversity authorities.	98%	1%	1%
112	All enterprise involved in all marine extraction or exploration must have a strict biodiversity net gain clause attached to their development permission and must be responsible for the ongoing and future management and enhancement of the biodiversity of their sites.	95%	5%	0%

Peatlands		Support	Do not support	No response
113	An updated National Peatland Action Plan must be developed with clear, measurable, realistic and timed goals and sufficient funding to protect and restore peatlands.	96%	2%	1%
114	The cessation of turf-cutting on protected areas must be fully implemented and enforced. To facilitate a true 'just transition', the State must provide adequate financial assistance to offer viable alternatives to people currently predominantly reliant on peat for heating their homes.	87%	11%	2%
115	The State must promote community engagement and wider awareness of the value of peatland restoration for nature and culture.	96%	2%	1%
116	The remits of Bord Na Móna & Coillte must each be reviewed to include a focus on Peatland restoration and rehabilitation projects, with targeted outcomes on biodiversity conservation. The results of these outcomes must be freely available and published annually.	96%	2%	1%
117	All enterprise involved in the harnessing of renewable energy from or on all peatland must have a strict biodiversity net gain clause attached to their development permission and must be responsible for the ongoing and future management and enhancement of the biodiversity of their sites.	95%	5%	0%
118	Develop a cross-agency response team to review practices of prescribed burning and address issues around implementation of guidance and recommendations to stop illegal burning	93%	6%	1%
119	Encourage and incentivise peatland owners to engage in the active protection of peatland biodiversity through appropriate management and restoration activities.	96%	1%	2%

Forestry, Woodlands and Hedgerows		Support	Do not support	No response
120	There is a conflict of interest between business aims and corporate responsibility, particularly for State agencies. The State must fundamentally reassess the constitution, goals and operations of Coillte and the 1988 Forestry Act (as amended). This reassessment must ensure biodiversity protection and positive eco-system services are core objectives for Coillte, alongside providing higher quality timber, meaningful employment and benefits to the community.	98%	1%	1%
121	State-owned woodlands should be recognised and managed as a strategic, long-term national asset for the benefit of the common good.	100%	0%	0%
122	Afforestation requires long-term goals and timelines. The State must legislate and provide funding for long-term investments in forestry, with strategic and ambitious emphasis on native woodlands. In addition, the State must ensure its afforestation strategy is not negatively impacting on biodiversity by establishing an effective monitoring system for the Forestry Programme.	99%	0%	1%
123	A new national strategy for the protection, maintenance, restoration and expansion of Ireland's network of hedgerows must be developed urgently. Existing legislation and regulations regarding hedgerows must be reviewed, strengthened and fully enforced, with due regard to public safety. Sufficient results-based incentives must be made available to support all aspects of their proper management. In particular, the new CAP schemes should recognize and reward good hedgerow quality.	100%	0%	0%
124	Forests currently planted and those already felled on peatlands are a significant and historic problem. The State should remedy this issue promptly and on a significant scale.	91%	6%	2%
125	The Department of Agriculture, Fisheries and the Marine must implement incentives for State, Semi State and commercial bodies to establish more nurseries for the cultivation of indigenous hedgerow species and indigenous broadleaf tree species.	99%	0%	1%
126	A significant proportion of profit earned through Coillte's commercial activities should be ringfenced and re-invested directly back into biodiverse forestry initiatives.	93%	5%	2%

127	The State must plan for appropriate felling management, including provision for continuous cover to encourage a more biodiverse and sustainable mixed forestry management model.	99%	1%	0%
128	The Department of Agriculture, Fisheries and the Marine must ensure that licensing requires site-by-site ecological assessments to ensure that biodiversity is not negatively impacted both within and outside protected sites.	93%	6%	1%
129	The use of pesticides in public and private forestry is to be reduced by at least 50%.	93%	6%	1%
130	Hedge management courses and certification should be reintroduced and it should be a requirement that all hedge cutting contractors and their employees complete such courses, and be licenced.	93%	6%	1%

Protected sites and species		Support	Do not support	No response
131	The designated sites and species are among our most important cultural, heritage, and biodiversity resources and their management needs to be sufficiently resourced to meet our EU obligations.	98%	1%	1%
132	The National Parks and Wildlife Service and other relevant agencies must be provided with targeted funding to provide sufficient resources and staff to manage designated sites and protect species, produce and implement management plans, enforce protections for designated sites on land and sea.	98%	1%	1%
133	Protected sites do not exist in isolation. These ecosystems require connectivity with areas outside these sites, with links between protected sites. These connections and links need to be considered, protected and improved in local authority planning and other activities.	98%	2%	0%
134	Hunting open season order list must be reviewed regularly to ensure alignment with the endangered species list.	93%	6%	1%

Invasive Species		Support	Do not support	No response
135	The management of invasive species needs to be carried out on an all-Island basis.	96%	4%	0%
136	Biosecurity must be increased at all points of entry to the country, in line with best international practice.	95%	4%	1%
137	The State must provide funding, education and infrastructural supports to engage local community groups in appropriately managing invasive species, which negatively impact native habitats and species.	96%	2%	1%
138	The State must produce a multi-agency National Invasive Species Plan to manage, monitor and collate information on the distribution of invasive species across the country. This should be used for coordinated control programmes and community awareness campaigns.	98%	1%	1%
139	The State must introduce effective population controls regarding invasive animal species, such as non-native deer and mink.	95%	4%	1%
140	The State must act immediately to put a timeline on the phasing out of, and eventual ban of, the sale of invasive species, e.g. Cherry Laurel.	89%	9%	2%
141	Regulations for the importation of recreational wildlife, classed as invasive species, must be reviewed.	96%	4%	0%
142	Schemes to incentivise people to buy native plants, shrubs and trees, including native fruiting trees and shrubs, to support garden biodiversity over non-native species should be devised and encouraged.	90%	6%	4%

Urban & Built Environment		Support	Do not support	No response
143	The State must reform and update the planning and building regulations and legislation to better consider biodiversity in all new developments, with specific evidence-based and locally relevant biodiversity and environmental measures (e.g. inclusion of nesting bricks, restriction of artificial grass, green planting, corridors, sand and water etc).	98%	2%	0%

144	Planning policy must be updated to require all new developments to have a significant net-gain for the environment and biodiversity.	95%	4%	1%
145	In line with international best practice, the State must increase mandatory requirements for a percentage of green spaces that support biodiversity in urban areas.	95%	2%	2%
146	Local authorities must raise the status of biodiversity to ensure that this is addressed and championed at the highest level in the organisation.	95%	1%	4%
147	The National Parks and Wildlife Service (NPWS), as well as bodies prescribed in legislation with regard to biodiversity and planning, including An Taisce, should be properly funded and resourced to effectively carry out their planning and development roles.	95%	4%	1%
148	The State must utilise public spaces, such as bus shelters and roofs, to create green corridors, green walls/roofs etc., to support pollinators and promote biodiversity.	96%	2%	1%
149	Authorities must incorporate ecological expertise in decision-making regarding planning.	96%	2%	1%
150	All Environmental Impact Assessments and Reports, and Appropriate Assessments and Natura Impact Statements must automatically be lodged with the National Biodiversity Data Centre so the data and information can be stored and made publicly accessible, with sufficient funding provided for such action.	98%	1%	1%
151	Each Local Authority must include a Green Infrastructure Strategy in County/City Development Plans which includes corridors between urban and rural biodiverse habitats, creation of new biodiverse spaces, retrofitting of existing spaces and restoration of degraded biodiversity.	99%	0%	1%
152	The State must introduce tax incentives and grants for capital investment in retrofitting existing buildings with biodiverse initiatives (roof gardens, vertical gardens etc.).	92%	6%	2%

153	The State must review An Bord Pleanála and local authority legislation and practices to take full cognisance of the Aarhus Convention, create more transparency, and grant citizens greater access to information and inclusion in decision-making related to environmental issues in planning.	90%	7%	2%
154	As part of the new National Biodiversity Plan, relevant Government departments and agencies must publish central advice for local authorities on incorporating nature based solutions and ecological features into new developments, ecosystem restoration, green infrastructure and biodiversity, addressing pollution issues (chemical, light, etc.), reinforcement and/or offsetting that can be linked to achieving local and national biodiversity objectives that would be identified in development plans and local area plans.	98%	1%	1%

Industry, Business and Tourism		Support	Do not support	No response
157	Ireland's tourism industry is dependent on the protection and good status of the environment and important biodiversity sites are often high amenity sites. The promotion of eco-tourism and amenities should therefore be consistent with biodiversity conservation and visitors should be managed to ensure that biodiversity is not damaged. Opportunities to include biodiverse positive areas and projects should be encouraged as an additional tool within the overall promotion of Ireland's tourism industry.	96%	4%	0%
159	All large businesses and financial organisations must develop a mandatory assessment and disclosure process of harmful impacts to biodiversity, with a mandated role (similar to a Health and Safety or Well-being officer).	92%	6%	2%

Appendix 4: Guidance for presenters on presenting to a lay audience

Presenting to the Assembly

Thank you for agreeing to present to Ireland's Citizens' Assembly on Biodiversity Loss. As with all other national Citizens' Assemblies, the work of this group has the potential to influence changes to policy and practices on a national level.

The Assembly is made up of 99 members from all across Ireland and from a wide variety of backgrounds. In order to facilitate the Assembly in their work coming up with and presenting their recommendations to the Oireachtas (Irish parliament), an outline of facts and issues should be provided to them with the intent of stimulating purposeful discussions. Considering the breadth and scope of the work of this Assembly on biodiversity loss, and that this is a non-specialist audience volunteering their time, we wanted to compile some suggestions to ensure your presentation makes a meaningful contribution to the considerations of the group. Should you be compiling additional documentation or video content to accompany your presentation, the same points should be relevant.

1. Get to the big picture first

As researchers, we often lay out all of the details and wait until the end of a paper or presentation to discuss the implications. For this audience, it may be more appropriate to start with the relevance of the presentation to the work of the Assembly and then go into the details.

2. Communicate only essential information

Allow yourself to take more time per point than you would with your peers. Eliminating all but the most essential pieces of your talk will give you space to unpack concepts that are unfamiliar to this audience.

You may wish to consider the “Three Ms of Messaging” recommended by the AAAS (American Association of Advanced Studies) to keep your message: memorable, meaningful and miniature.

The AAAS also suggest considering a three-point structure to a presentation to organise your message around. You may therefore wish to consider: What are the three things you want your audience to remember and respond to?

3. Use accessible language

We're often used to presenting to audiences where specialised terms and acronyms are useful. For non-specialist audiences, such as that of the Assembly, the content needs to be communicated in different ways, to make sure the audience can meaningfully engage with the information. Avoid jargon and acronyms wherever possible and don't be afraid to repeat important concepts or take-away messages multiple times using different phrasings or approaches.

This website may be useful for translating some technical terms: <https://climatejargonbuster.ie/>

4. Relate the content to your audience

Using metaphors, analogies and examples may help the Assembly members put the information into a context that is familiar and relatable to their work in the Assembly.

5. Minimise the content on your slides

For this audience, a high-level overview of information or findings is most relevant. Communicating in a visual way with infographics, graphs, charts or images will be impactful and memorable.

Further reading:

- <https://www.aaas.org/resources/communication-toolkit/communication-fundamentals>
- <https://questproject.eu/how-to-improve-science-communication-consider-these-12-guiding-principles/>
- <https://hbr.org/2016/09/how-experts-can-help-a-general-audience-understand-their-ideas>
- <https://www.insidehighered.com/blogs/gradhacker/communicating-research-general-audience>

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