



ALTER-Net/EKLIPSE key messages for the new EU Biodiversity Strategy, resulting from a multi-phased, iterative consultation survey among the networks' scientists and other knowledge holders. It is a key outcome of the 2019 ALTER-Net/EKLIPSE conference 'The EU Biodiversity Strategy Beyond 2020' that addressed the contribution that research can make in helping to define the strategy targets.

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1. European and global policies.

Europe to take a leading role in establishing an improved global policy on biodiversity.

European policy on biodiversity has – in principle, at least – been based on the recognition that biodiversity and the drivers affecting it have to be dealt with not only at the European scale but also globally, recognising the impact of international decisions on European biodiversity and vice versa. In the future, therefore:

- the development of European policy on biodiversity, whilst addressing the limitations of current policy including the perverse effects of European policy elsewhere in the world, must continue to be done in close collaboration with, and building on, the goals of the UN Convention on Biological Diversity (CBD), the UN 2030 Agenda for Sustainable Development and its Sustainable Development Goals (SDGs) and the work of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES);
- the EU should not simply follow the example of global policy developments but take an ambitious lead on biodiversity policy. It should learn from best practice everywhere, and not limit itself due to lack of vision and ambition.

A set of five key messages were deemed by the participants of the survey and the editorial team to have higher policy relevance and overarching, systemic value. These are ordered here according to their place in the DPSIR (Drivers Pressures State Impact Response) framework and are formulated to directly address the new EU biodiversity strategy.

2. Reconnecting society and people with nature for an improved recognition of the value of biodiversity and ecosystem services.

Develop initiatives that reconnect people and nature with the potential outcome of encouraging societal and individual mind-sets that recognise human dependence on nature, and the multiple values of biodiversity.

Reversing the ongoing biodiversity decline is hampered by the disconnect between humans and nature. Urbanisation, buying food directly in supermarkets and having jobs and daily life not in direct contact with nature distance people from biodiversity. This manifests itself in our misunderstanding of the intrinsic and relational values of biodiversity and of our dependency on biodiversity. Biodiversity and ecosystem services are the foundation of all potential human activities and quality of life, and should be managed and shared in a sustainable and equitable way rather than as means to sectoral goals that benefit a small minority of people. This requires that conservation of biodiversity and ecosystem services go hand in hand with the sustainable use of natural resources. To enable the reversal of the ongoing biodiversity loss and

ecosystem services degradation a change in mind-sets is needed across society to reconnect society and people with nature.

The EU strategy should include measures such as:

- Focusing on environmental respect, awareness of human dependence on biodiversity, awareness of limits to growth and the advantages of circular economy.
- Changing the economic and governance approach so that biodiversity conservation is no longer a minor consideration but protected by regulatory measures across all sectors.
- Integrating versatile education on biodiversity, ecology and sustainability in primary and secondary school curriculums for improved understanding of the importance and dependence of biodiversity, and encouraging citizen science activities in education to enable contact and experience with nature.
- Preserving existing or facilitating the creation of new collective and individual relational values with nature.
- Stressing the importance of nature for human mental and physical wellbeing.

For these actions to have impact, the EU will need to improve the coherence of the ethical foundations of its policies with the recognition of human dependence on nature and of the intrinsic and relational values of biodiversity.

3. Decoupling economic development from environmental degradation.

Stimulate policies that decouple economic development from environmental degradation, promoting such development within the ecological limits of the planet and the UN Agenda 2030 and its SDGs.

Economic growth, as measured through traditional Gross Domestic Product (GDP) across Europe, has indirectly reinforced drivers of biodiversity and ecosystem services loss. Although a range of policies, including environmental taxation, have been implemented to decouple economic development from drivers of biodiversity loss, policy instruments such as harmful agricultural and fishing subsidies, still impede transitions towards a sustainable future. Recommendations for decoupling economic development from environmental degradation include:

- Transforming taxation and other policies across Europe.
- Developing and using new indicators that incorporate human wellbeing, environmental quality, employment and equity, biodiversity conservation and nature's ability to contribute to human wellbeing. Existing problematical metrics such as GDP could, for example, be replaced by a natural capital accounting approach and quality of life indicators such as a happiness index.
- Enhance other perspectives such as Nature-Based Solutions and the circular economy.
- Promote biodiversity mainstreaming into EU policies that include economic aspects, such as the *Europe 2020 Strategy for Smart, Sustainable and Inclusive Growth* and *Towards a sustainable Europe by 2030*.

4. Core drivers of biodiversity loss and integration across sectors.

Target enhanced mainstreaming of biodiversity into other sectoral policies because the direct drivers of biodiversity loss are the consequence of indirect, or core, drivers such as human population density and the consumption of resources. This should include better integration across sectors and the designing of comprehensive biodiversity policy mixes.

The direct drivers of biodiversity loss include climate change; overexploitation of organisms through, in particular, hunting and fishing; land use change such as intensification of agriculture and forestry; pollution; and invasive species. These are the consequence of indirect, or core, drivers such as human population density and unsustainable resource consumption.

Recommendations for enhancing mainstreaming of biodiversity into policy sectors include:

- Greater recognition of the relationships between human activity and biodiversity across all policy sectors, thereby transforming all relevant policies, for example, the identification and elimination of harmful subsidies in the Common Agricultural Policy (CAP).
- Taking trade-offs involving biodiversity and ecosystem services between different policy and economic sectors (including agriculture, urban planning, water use and fisheries sectors and forestry) into account, for example the need to consider the impact on biodiversity of renewable energy policy implemented through bioenergy fuelwood.
- Designing comprehensive biodiversity policy mixes, including but not limited to regulation; and
 - integrating appropriate indicators that make a portion of funding conditional on ecological performance, e.g. habitat quality or management outcomes;
 - measuring national welfare using economic indicators that take into account the diverse values of nature;
 - developing fiscal reforms to provide integrated incentives and provide leverage to redirect activities that support sustainable development;
 - supporting mainstreaming of biodiversity in the UN 2030 agenda for sustainable development and its SDGs.

5. Monitoring and evaluation.

Recognize the unique place of monitoring trends in biodiversity and ecosystem services, not only for the implementation of existing policy, but also to provide early warnings if new action is necessary and to guide the development of new policies across all relevant sectors. Future monitoring of biodiversity should pay more attention to those species, habitats and biogeographical areas that have been relatively neglected. Scientific knowledge and expertise, particularly taxonomic, are needed to support monitoring and citizen science should play a greater role.

Monitoring trends in biodiversity and ecosystem services are necessary for: the implementation of policy, for example by assessing progress towards policy targets; evaluating the effectiveness of specific policies; informing the development of new nature conservation policies; providing early warnings to enable where and when action is needed; supporting adaptive management; and enabling the mainstreaming of biodiversity in other policy sectors. Although many species and habitats are already monitored, recent evidence of declines in insect abundance, for example, have shown that not all taxa are adequately monitored, including those assumed not to be endangered. Thus for improved monitoring:

- there is a need to ensure adequate coverage across all taxa and biogeographical areas and include sufficient data in terms of quantity and quality to allow vigorous evaluation of policies such as the Habitats Directive and Natura 2000;
- data from LIFE and other EU projects could be incorporated in monitoring programmes because of their data on the conservation status of species, although there needs to be recognition that not all Member States have sufficient resources and the data from some countries may not be up to date;
- monitoring of biodiversity should be adequately supported by experts, including taxonomists, and the latest developments in species identification;
- monitoring should address status and trends in ecosystems, species, functional and genetic diversity;
- volunteer citizen scientists can play a major role in monitoring but this requires incentives and support mechanisms for the collection, sharing and analysis of data;
- the need to adequately share data should be addressed through, for example, funding for database construction;
- equally important is the need for collecting and synthesizing social science data along with environmental data, including data on drivers of biodiversity change, from agriculture, energy, transport and other sectors, in order to produce knowledge useful for developing, implementing and

evaluating policies and practices related to the conservation of biodiversity and the sustainable use of ecosystem services;

- monitoring should also include change in societal attitude, and effectiveness of education related to biodiversity.

6. Research and knowledge-informed decision-making and implementation

Engage/initiate institutional mechanisms that can effectively synthesise scientific and other types of knowledge and suggest ways in which policy-makers and other societal actors can actively incorporate that knowledge into actions that promote biodiversity and ecosystem services.

For policy needs, development, implementation and assessment we recommend an effective knowledge strategy that promotes knowledge synthesis and development of policy options to be included in the strategy. Such an approach should:

- be informed by the best available knowledge, coming from wide-ranging disciplinary research;
- use interdisciplinary and transdisciplinary approaches, through for example the engagement of citizens, practitioners, other relevant societal actors;
- include local and indigenous knowledge, as highlighted in the assessments of the IPBES;
- make use of mechanisms that support knowledge-informed decision-making, such as the EKLIPSE mechanism.

Given the complexity of biodiversity and ecosystem services decline, it is crucial that all relevant research disciplines develop and cooperate to gain insight in the interactions of all factors. Using transdisciplinary research to improve the insights in these interactions is key to achieve sustainable development, but should be treated with caution to avoid promoting individual or organisational interests.

To address the challenges of current institutional settings, research and action should also focus on constructive ways in which policy-makers can and will actively incorporate knowledge into actions to address biodiversity loss.

A set of three key messages that were judged by the participants to the survey and the editorial team as having systemic value but slightly lower policy relevance than the former five ones:

7. Biodiversity Strategy / Climate change.

Systemically address the impacts of climate change on biodiversity.

The 2020 Biodiversity strategy and previous EU Nature policies (esp. the Habitats Directive) have been developed with limited consideration of climate change. With increasing awareness of climate change and its consequences for biodiversity, climate proofing of the new EU biodiversity strategy is urgent. In the specific case of the Habitats Directive, this has partly been taken into account by the EC through its guidelines on Climate Change and Natura 2000, but more should be done, such as:

- jointly rethinking different actions (e.g. Habitats Directive jointly with the Green Infrastructure strategy, or the Habitats and Birds Directives and other conservation policies in Europe) in the light of climate change with an emphasis on connectivity;
- revising the Habitats Directive to allow flexibility in the selection, management and targets of sites in light of climate change;
- establishing the Natura 2000 network more coherently across boundaries instead of establishing it independently within each EU member state;
- enlarging the conservation toolbox, considering: connectivity between protected sites; protecting non pristine sites with high ecological potential in the context of climate change; using disturbance for some sites for specific biodiversity goals while also considering using management cessation as a management tool in other sites.

8. Incorporate regional/transnational processes and long-term temporal scales to enhance success and efficiency of biodiversity policy.

Give greater consideration of large temporal and spatial scales and processes to enhance its success and efficiency.

Policy (e.g. Habitats and Birds Directives, Water Framework Directive, CAP, etc.) and management (e.g. monitoring, restoration, conservation) should incorporate larger temporal and spatial scales and processes (including transnational aspects when relevant) to enhance success and efficiency of conservation and restoration of biodiversity and ecosystem services. Indeed, biodiversity changes in one system affect biodiversity and processes in other systems.

Potential actions could include:

- Long-term considerations: use historical baselines within policy and management; integrate the very likely occurrence of long-term time lags between action and results on biodiversity, particularly in monitoring and evaluation of policy and management.
- Large spatial scales: support nations to work more together trans-boundary; integrate large-scale processes and pressures in the framing of policy.
- Monitoring and indicators: introduce the perspective of large temporal and spatial scales in monitoring methods and indicators across the EU so that processes operating at such scales are taken into account.

9. Participation and collaboration for ethical and sustainable decision-making.

Provide the ethical foundations for decision-making across generations and emphasize participation of diverse stakeholders to foster the integration of various forms of knowledge in policy- and decision-making while promoting shared responsibility.

The new Biodiversity Strategy should integrate various forms of knowledge through participatory processes and explicitly encourage the engagement of younger generations to safeguard the foundations of decision-making across generations. Currently, youth worldwide protest against climate and environmental change and as new biodiversity policies will affect the future generations their perceptions should be systematically acknowledged. Practitioners, policy and science should work multilaterally for sustainable decision-making and management. Increasing involvement of stakeholders will aid transparency and help integrate various forms of knowledge in policy- and decision-making, which is central for transformative change and promoting shared responsibility of biodiversity and decision-making related to it.

Recommendations in this regard include the need to:

- Involve and reach the younger generations through diverse methods of communication to enable their meaningful participation in decision-making and building the ethical foundation of future policy-making.
- Develop and implement systematic and flexible modes of participatory processes for different audiences in decision-making and knowledge production to support policy, including opportunities to participate via citizen science.
- Promote effective existing and new channels of transparent and legitimate participation and multilateral communication between different stakeholders.

A set of three key messages that were judged by the participants to the survey and the editorial team as having less policy relevance or less systemic value, but still judged to be important enough to be mentioned.

10. Restoration of ecological functions.

Target restoration of ecological functions as an important tool to conserve biodiversity and ecosystem services, including those involved in Nature-based Solutions.

Restoration of ecological functions provides an important nexus for the management of ecosystems, acknowledged by Target 2 of the current EU Biodiversity Strategy and the 2021-2030 UN decade on Restoration. Yet, ecological functions are relatively absent from the current Biodiversity Strategy, even though they are implicitly present in the Habitats Directive through the notion of good conservation status of habitats. Specific recommendations to focus on ecological function in the new strategy include:

- Defining the priority ecological functions to be targeted, by focusing on functions that both affect and are affected by biodiversity and ecosystem services. Priorities should also include functions that both contribute to the Biodiversity strategy and the Climate change strategy, and could, for example, include climate resilience and water management, including wetlands.
- Defining research priorities in this field, with a focus on the link between biodiversity and ecosystem services through ecological functions and subsequently on the refinement of the notion of healthy ecosystems.
- Incorporating the assessment of ecological processes in biodiversity monitoring, thereby providing a better understanding of the functional health and ecological vitality of ecosystems.
- Addressing constraints to ecological restoration, including perverse subsidies, complex legal and institutional arrangements, and low local political will.

11. Nature-based solutions (NbS) for sustainable development and nature conservation.

Promote the use of NbS whenever possible, to better integrate socio-economic, conservation and other environmental objectives.

Nature-based solutions may be defined as solutions to societal challenges that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience¹. NbSs for development projects seek to integrate socio-economic, environmental and ecological aspects and values. This improves the acceptance and effectiveness of these initiatives, especially locally, while solving societal and environmental, including biodiversity, challenges.

Recommendations on how to mainstream NbS in the context of biodiversity conservation include:

- Explore and aid the upscaling of local small-size NbS and encourage NbS mixes.
- Recognize the circumstances under which the use of NbS are most beneficial and avoid, in particular, undermining other nature conservation measures with NbS.
- Monitoring and evaluation of NbS should be included in the design of the initiatives and follow for example the recommendations of the Monitoring and Evaluation for Ecosystem Management (MEEM) framework².
- Encourage and educate local communities on NbS to illustrate the positive synergies of them for biodiversity and local development.

¹ <https://ec.europa.eu/research/environment/index.cfm?pg=nbs>

² [https://www.hutton.ac.uk/sites/default/files/files/research/srp2016-21/MEEM%20Technical%20Report%20\(Nov%202017\).pdf](https://www.hutton.ac.uk/sites/default/files/files/research/srp2016-21/MEEM%20Technical%20Report%20(Nov%202017).pdf)

12. Specificity of freshwater biodiversity.

Explicitly address the conservation and sustainable use of inland water biodiversity.

Freshwater ecosystems are a unique and important component of global biodiversity, providing clean water, food, livelihoods, and many other ecosystem services. At the same time inland waters face distinct threats so that the biodiversity of rivers, lakes and inland wetlands are declining at rates that far exceed those seen in forests and oceans, with an urgent need for action to reverse this trend. Yet, inland water lack explicit recognition in the biodiversity strategy so far (other than e.g. marine systems, or agricultural and forestry). Furthermore, coherence and complementary between biodiversity directives and other directives such as the Water Framework Directive (WFD) and Habitat Directive (HD) is lacking.

Recommendations to better include inland water ecosystems include the need to consider the following key issues:

- **Specificity:** Post-2020 targets should mention specifically the conservation of freshwater species and ecosystems, their genetic and functional diversity and the linkages and dynamics between land and water.
- **Justice:** Given the integrated nature of freshwater ecosystems and the ecosystem services they provide that sustain human livelihoods, minimum requirements to achieve basic access to water should also be addressed.
- **Targets and/or indicators:** Amend, revise or establish new targets or indicators, ensuring that they adequately represent the status of freshwater biodiversity and intimate linkage between land and water, including unreported interspecific and intraspecific biodiversity, habitat extent and condition, water quality and environmental flows, fisheries, presence of invasive species, extent and management of protected areas and other effective area-based conservation measure, and delivery of ecosystem services.
- **Coherence:** Establish coherence and complementary among biodiversity directives and other directives such as the WFD and HD.
- **Monitoring:** A more comprehensive monitoring of water quality and biodiversity is needed, including higher spatial and temporal resolution, consideration of “new” pollutants such as pesticides, microplastic, pharmaceuticals as well as mechanisms for adaptation to emerging ones. Monitoring of biodiversity should be comprehensive, addressing species diversity, as well as intraspecific diversity within and between populations. Several directives such as the WFD and HD generate extensive, spatially distributed datasets on aquatic biodiversity, however coherence and complementarity between these needs to be established and the data made available digitally, free of charge.