HOW TO ARGUE FOR BIODIVERSITY CONSERVATION MORE EFFECTIVELY

Recommendations from the BESAFE project

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BESAFE

BIODIVERSITY AND ECOSYSTEM SERVICES: ARGUMENTS FOR OUR FUTURE ENVIRONMENT

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BESAFE was a research project funded by the European Commission to explore how the concepts of ecosystem services and the 'value of biodiversity' can be used to improve conservation and biodiversity policy-making and governance at the local, national, European and global levels.

More details on the use and effectiveness of arguments and of the case studies can be found on the project website: www.besafe-project.net and on the project web tool: tool.besafe-project.net

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SUMMARY

Despite growing evidence that biodiversity is essential for human well-being, it continues to decline. To reverse the trend, society needs to be more convinced that further protective action is necessary. BESAFE addressed this challenge by analysing the effectiveness of different arguments for biodiversity conservation in a range of situations. It produced guidance that can help improve the way we use arguments for conservation and, thus, convincingly demonstrate the value of biodiversity to decision-makers.

Key conclusions are:

- **The success of a more integrated approach depends on stakeholder engagement.** A top-down policy framework that sets goals for the protection of particular sites and species is important, but it is not enough to prevent biodiversity loss. An integrated approach, seeking to 'mainstream' biodiversity concerns across all policy sectors (e.g. agriculture, forestry, water, energy, transport and urban planning) and including the biodiversity outside protected areas is needed. Consequently, success depends on the cooperation and active engagement of all the stakeholders needed to successfully implement protective measures.

- **Promote bottom-up initiatives at the local level.** All stakeholders need to be actively involved in the decision-making process, which should facilitate building trust and working towards generally agreed and accepted solutions. This is particularly important in situations of conflict between biodiversity conservation and the use of natural resources. Authorities should invest in adapting their role to initiate, facilitate, monitor, guide and encourage these bottom-up collaborative decision-making processes and actively support an adaptive management approach wherever possible.

- **Tailor arguments to the audience.** Arguments need to be framed to fit the values and goals of the audience, embracing the plurality of values attached to nature, and using appropriate language. For example, over-emphasising economic arguments could alienate people who are motivated mainly by ethical and moral concerns.

- **Use positive arguments.** Positive framing of arguments to emphasise benefits is often more powerful than negative framing that focuses on threats and losses. The concept of ecosystem services is useful for emphasising positive benefits, provided that it is properly explained to stakeholders.

- **Use a wider range of arguments.** Arguments based on the economic value of nature for humans dominate European and national policy-making, and are often seen as central to gaining high-level policy-maker support, but our results show that many decision-makers and other stakeholders also use and respond positively to ethical and moral arguments. Therefore, a wider range of arguments may be needed to engage all stakeholders, including those at the local and regional level. It can be highly effective to bundle together packages of positive arguments, including those on the value of nature to humans, as well as those based on the rights of species to exist and on an "insurance policy" approach stressing adaptation and resilience. These arguments should be seen as complementary, not as alternatives: the key recommendation is to ensure a better balance between the different types of arguments, and wider dissemination of these arguments to all stakeholder groups.

Wolf (Photo credit: John D.C. Linnell, NINA).

BACKGROUND

Early arguments for biodiversity were focused on the conservation of charismatic and rare species, and this later broadened to include the preservation of habitats and spectacular landscapes through networks of protected areas, such as national parks. The Millennium Ecosystem Assessment and other influential initiatives in the early 2000s triggered a major shift towards recognising the importance of ecosystems and their biodiversity in providing a wide range of services for humans. This "nature for people" framing sought to widen the range of arguments, and to "mainstream" conservation, attaching new importance to conserving nature outside protected areas and throughout all areas of human activity. At the same time it created a context, and policy demand, for attempts to "value" the benefits of nature in economic terms and allow comparison with measures of economic activity.

This shift, and in particular the use of monetary valuations, has been contentious. There is concern that arguments driven by ecosystem services and their economic value have become too prevalent, and could endanger biodiversity conservation. While economic arguments resonate strongly with some policy-makers, public support is often driven more by traditional nature conservation motives. Most recently, a softer approach has started to emerge, with a greater focus on the resilience and adaptability of social-ecological systems, i.e. the interconnection of nature and people.

THE CHALLENGE

Meanwhile, however, biodiversity has continued to decline. The question still remains: what arguments can convince society to take the actions necessary to stop biodiversity loss? In the BESAFE project we investigated how different types of arguments for biodiversity protection generate effects, and how their effectiveness depends on when, where and how they are used, seeking to determine how the effectiveness of biodiversity argumentation can be improved.

Biodiversity protection depends on people and the decisions they take. Different individuals and institutions hold diverse values and priorities, and will be convinced to protect or reduce their impact on biodiversity by different arguments. Understanding how argumentation works, on what value judgements the various arguments are based, and why some arguments are accepted and others rejected in particular situations can be crucial for improving decision-making processes and making people more aware of why biodiversity needs to be protected.

CASE STUDIES

BESAFE carried out 13 in-depth case studies covering different European countries, each addressing different issues related to biodiversity protection, and four EU-level studies (Figure 1).

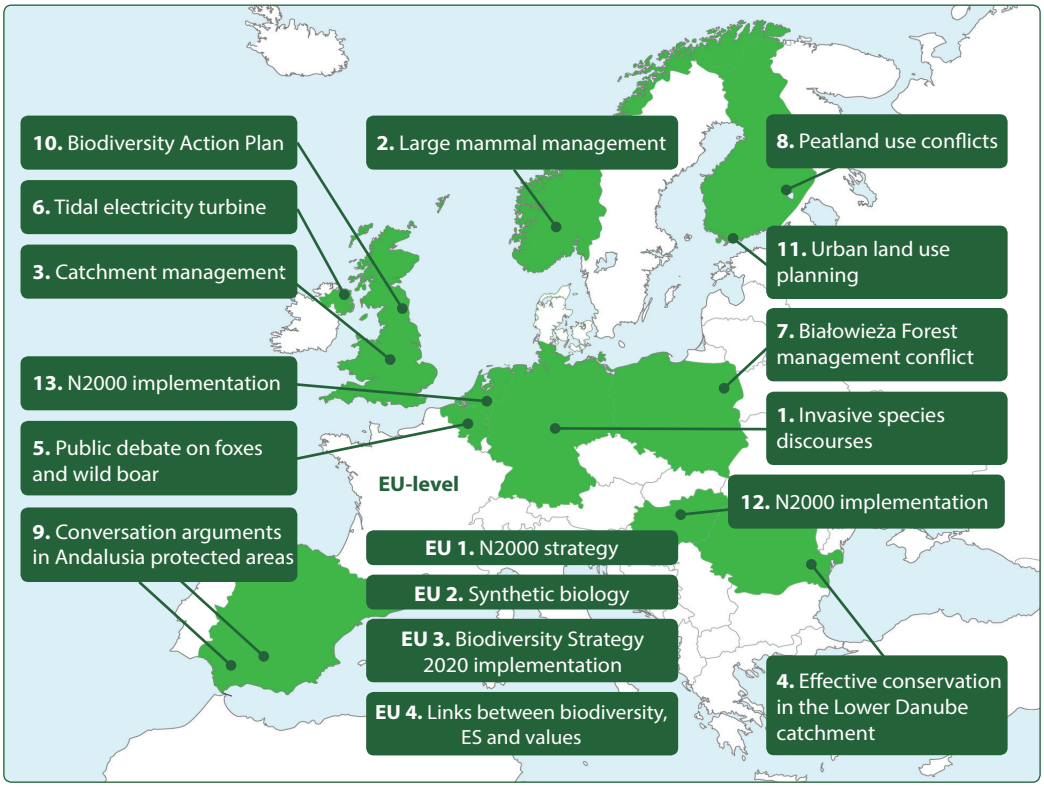

Figure 1. *The BESAFE case studies (N2000 = Natura 2000; ES = ecosystem services).*

1 **Invasive species discourses in Europe:** scientific disputes on the value of invasive alien species, and the role of these arguments in the development of an EU regulation on invasive alien species.

2 **Large mammals in Norwegian wildlands:** conflict between different interest groups including conservationists, farmers and hunters over a 2011 policy on the management of bear, lynx and wolves, with perceived and actual trade-offs between the presence of carnivores and other interests (e.g. sheep farming, forestry, hunting, and outdoor recreation) that also reflect conflicts between the intrinsic value of wildlife, provisioning services (e.g. sheep farming) and cultural services (e.g. hunting).

3 **Catchment management in the UK:** how information on the economic benefits of ecosystem services was used to justify large-scale investment by water companies in catchment management, i.e. restoration and protection of ecosystems in water catchments as an alternative to expensive conventional water treatment technologies.

4 **Conservation in the Romanian Lower Danube River catchment:** conflicts between proposed measures for sustainable management, conservation and restoration of the river catchment and sectoral policies promoting the maintenance of the current structure, intensification of agricultural practices and intensive exploitation of other production functions (e.g. fish).

5 **Public debate on the return of red fox and wild boar to Flanders:** the on-going heated dispute following the rapid spread of foxes and wild boar in Flanders, Belgium, related to the broader issue of our co-existence with wild animals in urban environments.

6 **An underwater tidal electricity turbine, Northern Ireland:** how "try it and see" adaptive management and monitoring helped to reduce conflicts over the establishment of the world's first commercial open stream tidal turbine (green energy vs. risks to marine wildlife).

7 **Białowieża Forest conflict, Poland:** conflict between forestry management and conservation in the last large remnant of near-natural lowland temperate forest in Europe.

8 **National Strategy for Mires and Peatlands, Finland:** analysis of the arguments used in recent public debate at the national level and a decades long legal process regarding peat extraction, which resulted in establishment of a protected area at the local level.

9 **Conservation arguments in Andalusia protected areas:** analysis of stakeholder (residents, tourists and conservation professionals) attitudes to arguments based on the ecosystem services provided by protected areas in the Sierra Nevada mountains and Doñana wetlands, to find out whether the ecosystem service approach could strengthen conservation strategies and solve social conflicts. Also analysis of how traditional livestock practices are considered and managed within protected areas.

10 **Local Biodiversity Action Plans in the UK:** effectiveness of packages of positively and negatively framed arguments in a range of local projects related to the UK Biodiversity Action Plan.

11 **Urban development, Finland:** use of ecosystem service arguments at different stages of a planning competition for the development of a sustainable urban area in the Helsinki metropolitan area.

EU 1. Implementing the Natura 2000 network in Europe: analysis of LIFE projects across Europe, including the Natura 2000 processes in the Netherlands (12) and in Hungary (13), to investigate similarities and differences between arguments used at the EU and national levels.

EU 2. Synthetic biology: analysis of the role of economic concepts and arguments in the development of synthetic biology and its governance.

EU 3. Biodiversity strategy to 2020: comparison of arguments used in formulating the Biodiversity Strategy at the EU level and implementing the strategy at the Member State level, using an argument mapping tool.

EU 4. Links between biodiversity, ecosystem services and values: a literature review to determine how biodiversity underpins the delivery of ecosystem services, and a study of how stakeholders rank different arguments for biodiversity and ecosystem services.

Lynx (Photo credit: John D.C. Linnell, NINA).

Use of arguments at different governance levels and policy stages

At the global level, many arguments focus on social benefits, based on equal access to resources and the role of biodiversity in poverty alleviation. At the European (EU) level, however, arguments based on the economic value of biodiversity to humans have become dominant. For example, the EU Biodiversity Strategy to 2020 focuses heavily on the links between biodiversity, ecosystem services and the Green Economy. Moral reasons for biodiversity protection are still acknowledged, for example through reference to the need to preserve biodiversity for future generations, but not emphasised. National authorities echo this argumentation, but also refer to legal obligations as arguments to justify their adoption of EU policy.

At the local and regional levels, where there is a wider range of audiences to convince, ethical and moral arguments are used alongside economic arguments. This also applies to the development of non-binding, voluntary agreements and targets. Ecosystem service arguments often play a role, even though non-specialist audiences are usually unfamiliar with the concepts and the terminology.

What does an ecosystem services based approach add?

By reviewing scientific evidence on the connection between ecosystem services and biodiversity we found that in general a higher level of biodiversity boosts ecosystem service delivery (Figure 2). For example, greater areas of forest are linked to better flood protection and more carbon storage, and more species-rich flower borders provide better habitat for pollinators. Awareness of these links can, therefore, provide additional reasons to protect biodiversity. However, there are some negative links – for example, certain types of forest such as pine or eucalyptus plantations can reduce freshwater provision in areas where water is scarce.

On the other hand, over-exploitation of ecosystem services – especially provisioning services such as food and water, but also some cultural services, such as recreational fishing or tourism – generates significant pressures on biodiversity. So policy and management must be designed carefully to balance competing demands for different services with protection of the ecosystems and biodiversity that provide them. Restoring and protecting ecosystems can increase the delivery of some services, especially regulating and cultural services such as flood protection and aesthetic value, but it may also be necessary to limit the exploitation of some ecosystem goods and services. The capacity of an ecosystem to deliver services can also be increased by reducing other pressures, such as pollution or the spread of invasive species.

Box 1: Local use of ecosystem service arguments in Finland

In Case study 11, the local authority in a municipality near Helsinki decided to hold an open competition to design a new housing development for 100,000 people. Although the competition guidance encouraged consideration of ecosystem services, the concept was not taken up by the planners entering the competition. Arguments related to some specific ecosystem services, such as recreation, food production and rainwater management, were taken up and persisted to the implementation stage, but were treated as isolated considerations. Similarly, biodiversity was addressed separately, through assigning protected sites. This meant that the opportunity to design integrated, multifunctional green and blue infrastructure across the landscape was lost.

In Case study 8, local people fought a long-running campaign to save the Viurusuo wetland from peat extraction. Although the ecosystem services concept was not explicitly used, local people used a wide range of arguments based on amenity values, including the threats to water quality and quantity, wild food (gathering berries), aesthetic value, socio-economic issues (house prices and attracting people and jobs to the area), recreation (walking and bathing) and air quality (dust), as well as moral and ethical arguments related to the rights of species to exist and our obligations to preserve landscapes and wildlife for future generations. These arguments were not effective by themselves, but the persistence of the local campaign led to the involvement of regional NGOs, who gathered scientific evidence on the value of the wetland for biodiversity and climate change. Eventually, after 17 years and many legal appeals on both sides, this led to the national government protecting the area by buying it from the peat extraction company. Although the reasons cited were based on the the biodiversity value of the area, it is likely that the vigorous local campaign also played a part in helping to shift the opinions of decision-makers.

Peat bog (Photo credit: Rob Bugter).

In order to find out how the perspectives of stakeholders differed, we carried out a survey of decision-makers, researchers and NGO representatives, asking them to rank statements reflecting different types of arguments for biodiversity conservation (ethical, economic, etc.). The study found that, irrespective of their perspectives on whether or how biodiversity can be valued, most stakeholders acknowledged the ethical importance of biodiversity protection. At the same time, they rejected the concern that the valuation of ecosystems is likely to provide a justification for their destruction, i.e. the 'nature for sale' argument.

This diversity of views suggests that there is room for a wider range of arguments for the conservation of nature, and that arguments based on monetary value and intrinsic value can be mutually reinforcing. There may be a tendency to assume that decision-makers are forced to rely largely on financial arguments, and that monetary valuation of ecosystems is the only way of demonstrating their importance. But it is clear from our study that many stakeholders from all walks of life – including high-

Links between biodiversity and ecosystem services are mostly positive...

	Spcies abundance	Species richness	Species diversity	Species size/weight	Mortality rate	Functional richness	Behavioural traits (pollination)	Behavioural traits (biocontrol)	Community/habitat area	Community/habitat structure	Primary production	Aboveground biomass	Belowground biomass	Stem density	Community/habitat age	Litter/crop residue quality
Provisioning services																
Timber production	↑	⬆↓														
Freshwater fishing	↑	↑		↑	↓						↑					
Freshwater provision									↑↓					↓	↓	
Regulating services																
Water purification		↑							⬆							
Water flow regulation									⬆	↑					↑	
Mass flow regulation		↑							↑	↑		↑	↑			
Atmospheric regulation		↑	↑	↑	↓					↑		↑	↑		↑	↑
Pest regulation	↑	↑				↑		↑	↑	↑						↑
Pollination	↑↓	⬆					↑									
Cultural services																
Recreation (species)	↑↓	↑	↑	↑												
Landscape aesthetics									↑	⬆						

...but there are some negative links, e.g. between forest area and freshwater provision

Figure 2. *Summary of positive and negative relationships between biodiversity attributes and ecosystem services: ⬆ = strong positive relationship (found in ≥ 50% of papers); ↑ = moderate positive relationship (found in 10-49% of papers). ↓ = moderate negative relationship. Weak relationships (i.e. those found in <10% of papers) are excluded.*

level decision-makers – attach considerable importance to the intrinsic value of nature, and place a high value on cultural and aesthetic ecosystem services.

Ecosystem service arguments were found to play an important role in the BESAFE case studies (see Box 2 for an example). In fact, 60% of all the arguments used were related to ecosystem services, though often these services (e.g. water supply, livestock production, tourism) were referred to without explicitly using the ecosystem service terminology. This reflects the fact that non-specialist awareness of the concepts and terminologies of ecosystem services is generally low, and varies considerably between stakeholder groups, reflecting differences in their occupation, socio-economic situation and degree of dependence on specific services.

There is evidence from the case studies that better communication with stakeholders about the importance of ecosystem services, and the way in which they depend on underlying biodiversity, can enhance the value they place on lesser-known services. However, stakeholder preferences partly reflect their personal interests and dependence on certain ecosystem services, so better ecological information cannot be expected to fundamentally alter their viewpoints, and conflicts may still remain (Box 3). Analysis of the synergies and trade-offs between services could be useful in finding solutions to conflicts, and balancing the social, economic and ecological interests of different groups.

In summary, ecosystem service arguments can be very important for highlighting the economic and social value of biodiversity, and for framing the arguments for biodiversity conservation in a positive way, but they do not solve all problems. They are best used together with arguments on the intrinsic value of nature, and they should be tailored to the specific interests and goals of stakeholders. Most importantly, they are best used in participatory processes in which stakeholders

Box 2: The value of ecosystem service arguments in the UK water industry

The social and economic value of ecosystem services can tip the balance in favour of biodiversity protection and restoration. For example, in the UK (Case study 3) arguments showing the benefits of ecosystem services (water quality, recreation, carbon storage and flood management) persuaded the water price regulator to approve large-scale water company investment in restoring and protecting water catchments, for example by restoring vegetation cover in eroded peat moorland, or planting trees. Protecting water quality in this way was found to be six times cheaper than conventional water treatment. As a result, ecosystem service arguments are now an integral part of UK water industry planning.

Box 3: How better communication of scientific evidence can improve biodiversity arguments

Improved transfer of scientific knowledge can raise awareness of, and concern over, ecosystem services. For example, in Spain (Case study 9) and Romania (Case study 4) local people were initially concerned mainly with provisioning services, but after being given a list and description of all the services they also recognised the importance of regulating services. In Northern Ireland (Case study 6), concern over the impacts of a tidal energy turbine on biodiversity and other ecosystem services was gradually alleviated by improved scientific knowledge resulting from the monitoring programme.

In the UK (Case study 3), scientific studies helped to persuade the water price regulator to support investment in protecting and restoring water catchments even though quantitative data on the benefits was poor. The investment was widely supported by stakeholders because of the clear and simple logic of the argument (it is better to reduce pollution at source) and the economic benefits for water companies, consumers and farmers alike.

These findings highlight the need for improved scientific knowledge, and for better communication of that knowledge to key stakeholders, especially where there are conflicting perspectives and existing support for ecosystem services is low. Even with the best scientific knowledge, however, it is important to acknowledge that sometimes decisions will involve value judgements, as in the case of the Norwegian debate on large mammals. In this case, all stakeholders agreed on the need for a wide debate about the values attached to different ecosystem services.

The SeaGen tidal turbine with its rotors withdrawn above sea-level (Photo credit: Ardfern, (Own work) CC-BY-SA-3.0 or GFDL, via Wikimedia Commons).

identify the services and values most important to them, and conflicts and trade-offs are resolved through negotiation. This can take time, but it is more likely to result in sustainable solutions that are accepted by the local community.

Effective use of arguments

A key observation from our case studies and from working with a range of stakeholders is that the effectiveness of arguments depends on tailoring the choice of arguments, and the way in which they are used, to the situation and audiences. Arguments need to be both credible and relevant (Figure 3). What works, where, and when, is context-dependent and cannot easily be generalised. A number of general conclusions can, however, be drawn concerning the process of finding the right arguments and the way to use them most effectively:

- **Understand the situation.** Knowing the situation, the people involved and their interests is important for the choice of arguments. Argument mapping can be a useful tool to help simplify and understand complex argument threads, as visualised in the BESAFE EU-level study on the implementation of the Biodiversity Strategy (Figure 4). This can identify gaps or areas where arguments are weak and could be strengthened, although gaps can also arise because arguments are not relevant or effective in a particular context.

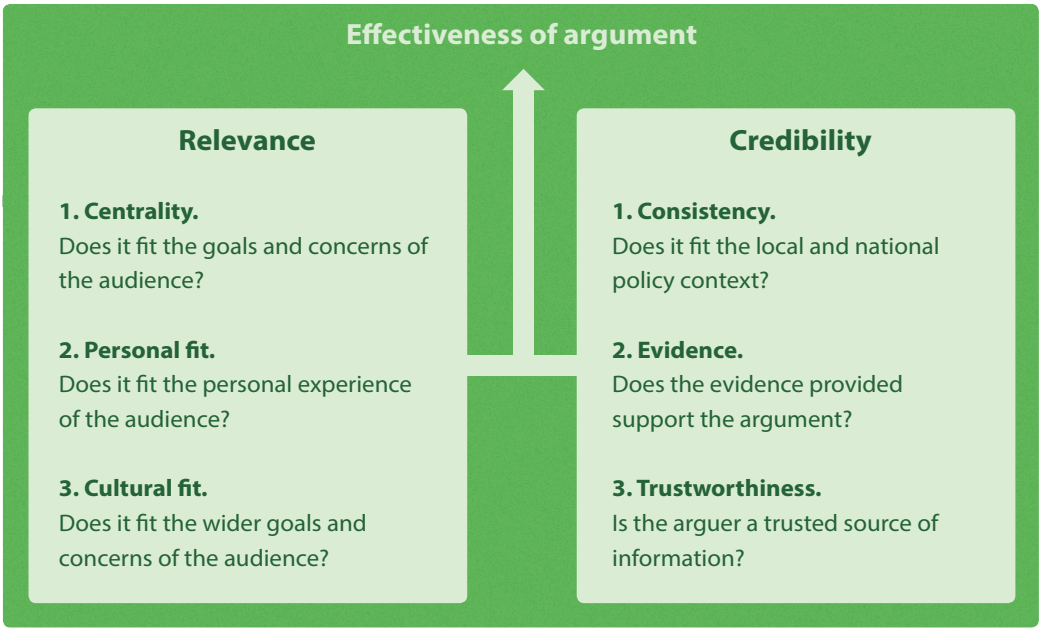

Figure 3. *Criteria for effective arguments (after Benford and Snow, 2000).**

**Benford, R. D. & Snow, D. A. 2000. Framing Process and Social Movements: An Overview and Assessment. Annual Review of Sociology, 26, 611-39*

- **Tailor arguments to the audience.** All stakeholders, not just decision-makers, can be targets to convince. This requires using language and terminology that can be easily understood, choosing arguments that match the goals and interests of the audience, and trying to identify common ground (Figure 5), as well as carefully listening to the arguments from all parties involved.

- **Use combinations of arguments.** Combinations of arguments help broaden the appeal and facilitate dialogue, especially when combining arguments on the value of nature for its own sake with those on the benefits of biodiversity for local livelihoods and other specific groups (Box 4).

- **Use positive framing.** Positively framed arguments (emphasising benefits of biodiversity) are often more effective than negatively framed ones (focusing on threats, risks and losses) (Box 4). Ecosystem service arguments can be useful to emphasise the positive benefits of biodiversity for humans, provided that the terminology and concepts are clearly explained to the audience.

- **Be persistent.** Decision-making takes time, and the parties involved have to get to know one another and build trust. Arguments are more effective if they persist throughout a process, and repetition and reformulation of arguments can be important tools for learning and building acceptance.

- **Encourage constructive dialogue.** Successful long-term solutions require all stakeholders to be involved in the decision-making process. It is important to encourage constructive dialogue and to avoid becoming trapped in a polarised debate where society divides along fault lines and it is hard to find common ground (see Boxes 5 and 6).

- **Think across policy levels.** Effectiveness can be increased by using arguments and interests from multiple policy levels (e.g. local, regional, national). The bottom-up diffusion of local livelihood arguments to higher governance levels brings 'real' context to strategic debates, while local concerns can benefit from being set in a broader context (see Box 1).

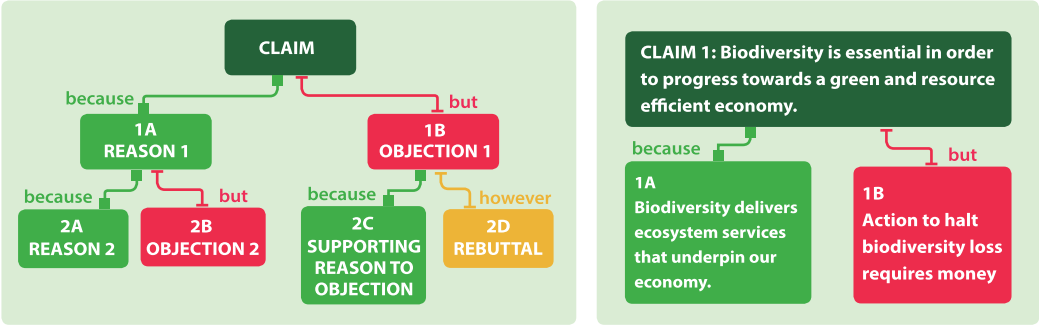

Figure 4. *Argument mapping and an example from the EU Biodiversity Strategy.*

Box 4: Framing, tailoring and combining arguments

Table 1 shows a wide range of positive and negative arguments that were used in nine examples of arguments to protect or restore biodiversity under the UK Biodiversity Action Plan (Case study 10). In general, positively framed arguments were more successful than negatively framed ones, especially when they were aligned with the interests of the target audience.

There were clear examples where the use of ecosystem service arguments combined with arguments on the intrinsic value of biodiversity worked, where arguments based just on intrinsic value would have failed. For example, the arguer in the case of a successful application to buy land for conservation used arguments that were closely aligned with the goals of the decision-maker and local people, including synergies with cultural heritage and recreation opportunities:

"it couldn't just be the wildlife aspect, it had to be very people focused […] without doubt they wouldn't have approved it […] we couldn't just say it's great for wildlife, you know, fund us and we'll get a few people on site […] there were other things we had to bring in and highlight to be able to buy this site to secure it."

However, negatively framed arguments could also be effective provided that they were consistent with the local and national policy context, i.e. in line with legislation and targets to protect biodiversity. It also helped if the arguer was trusted and respected by the decision-maker.

Ecosystem service arguments can also be used in a negative way by opponents of conservation. In the Białowieża Forest in Poland (Case study 7), the foresters opposing the enlargement of the protected area successfully argued that local people would lose the use of the forest for services, such as provision of firewood, berries and mushrooms, as well as losing jobs in the forestry industry. This outweighed the arguments of the conservationists which were based mainly on the intrinsic value of nature.

Bialowieża Forest (Photo credit: Grzegorz Mikusinski).

Table 1. *Positive and negative arguments used in the UK Local Biodiversity Action Plan (Case study 10)*

Negative framing	Positive framing
Restrictions	**Benefits and opportunities**
1. Duty to protect internationally important species and habitats 2. Duty to protect nationally designated sites important for biodiversity 3. Duty to protect nationally important species and habitats 4. Obligation to protect nationally important species and habitats 5. Obligation to protect locally designated sites important for biodiversity 6. Obligation to protect local priority species and habitats	1. Reduce costs 2. Resource efficiency 3. Increase resources 4. Conservation of cultural heritage 5. Local character, distinctiveness and pride 6. Flood prevention 7. Improve water and air quality 8. Climate change mitigation 9. Enhance people's lives in urban areas 10. Visual attractiveness of urban areas 11. Physical health 12. Mental wellbeing 13. Children's development 14. Recreation for local people 15. Community involvement 16. Sustainability 17. Economic development 18. Reduce anti-social behaviour 19. Sustainable transport routes 20. Political support
Specific threats to biodiversity	
7. Climate change 8. Actions on site contributing to climate change 9. Human activities (development, agricultural) causing decline 10. Inappropriate management (especially for specialised species and habitats) 11. Recreation pressure 12. Uncontrolled access 13. Socially undervalued habitats 14. Low genetic diversity and disease 15. Invasive species 16. Low awareness 17. Vandalism and anti-social behaviour 18. Unequal action for uncharismatic habitats 19. Public perception 20. Resource availability	

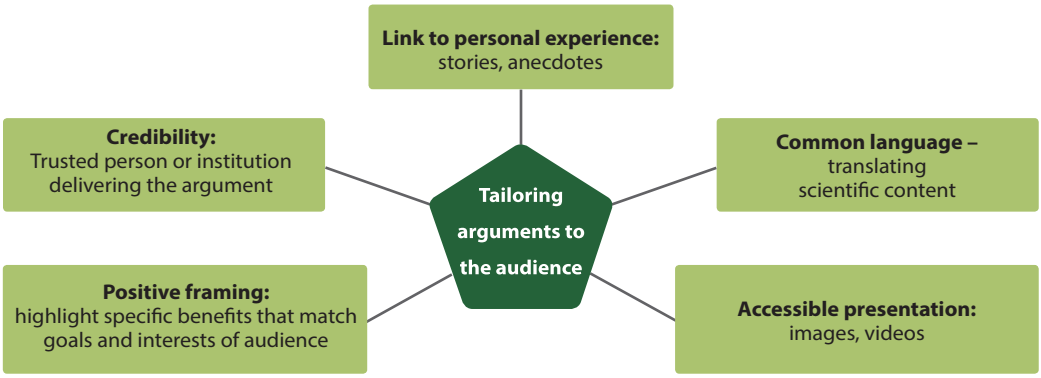

Figure 5. *Tailoring arguments to the audience.*

Box 5: Polarising dynamics of debate on foxes and wild boar in Flanders, Belgium

The rapid spread of red fox and wild boar into Flanders (Case study 5) led to a highly polarised debate which unfolded along three main fault lines:

- Fox and boar belong vs. do not belong in Flanders.
- They are useful and provide opportunities (e.g. fox control rabbits, boar are a tourist attraction), vs. they pose a threat, (e.g. fox kill chickens, boar attack walkers).
- Nature keeps itself in balance vs. we need to control populations.

Several dynamics in the argumentation increased the polarisation of debate and complicated the resolution of conflict. Arguments converged on a limited set of dichotomies (e.g. natural/artificial, belonging/not belonging, useful/harmful and in/out of control). As a consequence, the parties became trapped in a cycle of continuously repeating their arguments based on these dichotomies, thus limiting the scope of debate, emphasising the incompatibility of the viewpoints and closing off the possibility of finding alternative intermediate solutions that strike a balance between the two opposite poles. As the debate progressed, conflict was intensified by the use of stereotypes and stigmas surrounding group identities, e.g. hunters are cruel, conservationists are elite 'nature fascists'. This reduced the potential for a solution to be found, and prolonged the debate, which is still ongoing. The case study highlights the need to find more constructive ways to conduct debates over contentious issues, including 'de-dichotomising' the language in order to find common ground, and building meaningful contact between opposing groups.

Wild boar family in a Belgian forest (Photo credit: INBO).

Box 6: Building trust over time in Romania

The unique wetlands of the Lower Danube Catchment in Romania (e.g. The Small Island of Braila in the Danube Delta) are threatened by human activities such as land use change and overexploitation of natural resources that can have major negative impacts on natural ecosystems. Protection of the area improved following the accession of Romania to the European Union, but this led to various conflicts with different sectoral development areas (e.g. transport infrastructure, water supply, intensification of fishing and agriculture, and timber production). However, a long process of awareness-raising and trust-building resulted in gaining the support of interested stakeholders (from the local population to sub-regional, regional and national authorities) for sustainable management plans. The case study highlights the importance of gaining the trust and support of local people by using clear and understandable language to present scientific information, by making good use of traditional local knowledge (e.g. on wetland management), and by building relationships with the local community, convincing and demonstrating to them that their opinion is important and is integrated in the measures taken to protect biodiversity.

Conclusions

Top-down nature protection is not enough

An effective operational top-down policy framework is important to guide bottom-up initiatives, for example by setting goals or limits, but it is not enough. Top-down implementation of a system of protected sites and species has not halted biodiversity loss - as is recognised in, for instance, the European Union's Biodiversity 2020 and Green Infrastructure strategies, and in the CBD's Aichi targets. We need a much more integrated approach to conservation, which also targets the biodiversity outside protected areas and seeks to 'mainstream' biodiversity concerns across all policy areas, including agriculture, forestry and urban planning (Box 7). Our findings show that the success of this approach largely depends on convincing actors at all levels of the necessity and benefits of protecting and investing in biodiversity, and of the active role they themselves need to play in this process.

Foster bottom-up initiatives

Effective biodiversity protection requires processes that consider arguments from different governance levels and that take the interests of all parties into account. This requires the active participation of all parties in the deliberation process, the building of trust and working towards balanced solutions. This suggests the need for bottom-up processes at the local level, where the role of authorities is one of initiation, facilitation and monitoring. Authorities should invest in adapting their role to guide and encourage these bottom-up collaborative decision-making processes, and actively support an adaptive management approach (where policies are continually reviewed and adjusted in the light of new evidence and stakeholder feedback) wherever possible.

Tailor arguments to the audience

It is crucial to frame arguments to fit the values and goals of the audience, and use language that they can understand to explain scientific evidence clearly. There is potentially a lot to be gained by increasing awareness and understanding of ecosystem services, especially at the local and regional level, but over-emphasising economic arguments could alienate stakeholders who are motivated mainly by ethical and moral arguments. Arguments should address all or most of the interests held by actors involved in biodiversity conservation, as this will increase understanding of the consequences of actions and help to reach more generally supported solutions.

Ecosystem services are useful positive arguments – but conflicts need to be managed

Positive framing of arguments to emphasise benefits is often more powerful than negative framing that focuses on threats and losses. The concept of ecosystem services is useful for emphasising positive benefits, provided that it is clearly explained to stakeholders. Ecosystem service arguments can demonstrate the social and economic value of biodiversity, which can help to counter the pressure on biodiversity from economic activities such as agriculture or development. However, over-exploitation of some services (mainly provisioning services and tourism) can lead to conflicts and trade-offs with many regulating services and biodiversity. Careful management can often mitigate these conflicts.

Combine arguments and use a wider range

Economic and ecosystem service arguments dominate European and national policy-making, and are often seen as central to gaining high-level policy-maker support, but our results show that many decision-makers and other stakeholders also respond positively to ethical and moral arguments. Authorities should also recognise the need for the support, involvement and contributions of parties who are motivated by other reasons, such as love of nature or the value of nature for its own sake. Therefore a wider range of arguments may be needed to engage all stakeholders, including those at the local and regional level. It can be highly effective to bundle together packages of positive arguments, including those on the value of nature to humans, as well as those based on the rights of species to exist and on the "insurance policy" approach stressing adaptation and resilience. These arguments should be seen as complementary, not as alternatives: the key recommendation is to ensure a better balance between the different types of arguments, and wider dissemination of these arguments to all stakeholder groups. In particular, our results could be used to justify a stronger emphasis on ethical and moral arguments for biodiversity conservation, alongside the economic arguments.

Roe deer (Photo credit: J.D.C. Linnell/NINA).

Box 7: Integrated approach to conservation in Andalusia Natural Protected Areas

The Sierra Nevada mountains and Doñana wetlands in Andalusia (Case study 9) contain unique wildlife and habitats, but are threatened by conflicts and trade-offs between ecosystem services. For example, coastal tourism and intensive agriculture (rice and strawberry farming) are causing over-extraction of water in Doñana, while the expansion of skiing and the abandonment of traditional farming have a negative impact on erosion, hill stability and landscape aesthetics in the Sierra Nevada. There are also conflicts between conservationists and local people over the use of the land for farming.

To address these conflicts, the areas are gradually moving from an 'island' model where strictly protected areas are surrounded by intensively used land, to a more integrated approach that recognises both the intrinsic value of nature and the value of different ecosystem services, and tries to maximise synergies between economy, environment and society. Cultural and environmental services provided by traditional livestock grazing are recognised, and the focus is on finding ways to manage the land sustainably with socio-economic benefits for local communities.

Island model

- Conservation just in protected areas.
- Human use restricted
- Ecosystems threatened by activities in surrounding areas
- Intrinsic /moral/legal arguments

Ecosystem services

Sustainable management

Integrated model

- Strategy covers whole region
- Benefits for both nature and humans: social, economic, ecological
- Both intrinsic and ecosystem service arguments

Flamingos in the marshes - Doñana (Photo credit: Berta Martin-Lopez).

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Despite growing evidence that biodiversity is essential for human well-being, it continues to decline. To reverse the trend, society needs to be more convinced that further protective action is necessary. BESAFE addressed this challenge by analysing the effectiveness of different arguments for biodiversity conservation in a range of situations. It produced guidance that can help improve the way we use arguments for conservation and, thus, convincingly demonstrate the value of biodiversity to decision-makers.

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