BIODIVERSITY AND ECOSYSTEM SERVICES: ARGUMENTS FOR OUR FUTURE ENVIRONMENT

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1 Executive 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.

2 Summary description of project context and objectives

In order to protect biodiversity, policy makers increasingly require demonstration of its value. BESAFE uses case studies to investigate how much importance people attribute to alternative arguments for the protection of biodiversity and in particular how this relates to ecosystem services. It focusses on the arguments used by policy makers at different governance levels and in different ecological, socio-economic, spatial and temporal contexts.

The general aim of BESAFE was to improve our understanding of the alternative ways in which concepts for the 'value of biodiversity' can be used to improve biodiversity policy making and governance at local, national and European to global scales. BESAFE has investigated and analysed the use and effectiveness of various types of arguments for biodiversity protection under varying circumstances.

The general objective of BESAFE was to help to innovate and improve biodiversity protection by providing a framework that summarises the observed and potential effectiveness of the alternative ways to argue the case for biodiversity protection, and to make this framework easily accessible and usable through a publicly accessible database and associated user-friendly web tool. This system can then be used to convincingly demonstrate the value of biodiversity to policy makers as well as providing them with guidance on the use and effectiveness of the various arguments in a range of situations.

This general aim and objective were translated into six practical objectives around which the applied research work of the project was structured:

1. To build a provisional framework of arguments for the value of biodiversity.
2. To analyse the effectiveness of arguments through a diverse set of case studies.
3. To examine interactions between governance scales within the context of the case studies
4. To investigate relationships between biodiversity, ecosystem services and values within the context of the case studies
5. To synthesize the outcomes from the case studies into a final framework, database and user-friendly web tool for evaluating and selecting alternative methods and arguments for the protection of biodiversity.
6. To integrate stakeholder perspectives into the research process and widely disseminate the project findings.

To achieve these objectives, BESAFE carried out 13 local case studies and four general case studies (see Figure 1). Stakeholder perspectives were integrated through these case studies as well as through three special stakeholder workshops and a final conference. During these events, as well as through separate consultations, stakeholders provided ideas and feedback for the design and development of the BESAFE toolkit and web tool.

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).

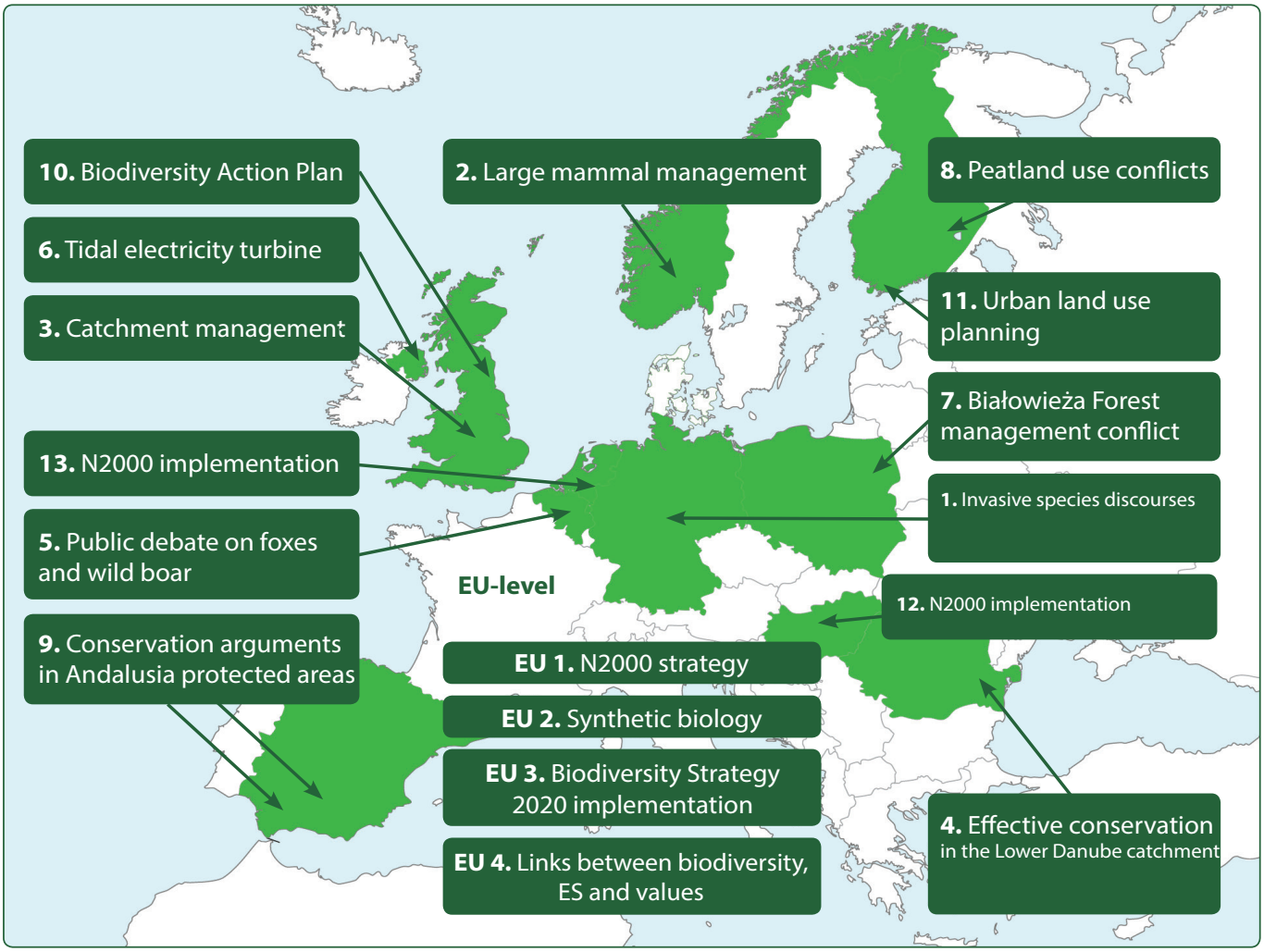


Figure 1. *The BESAFE case studies (N2000 = Natura 2000; ES = ecosystem services).*

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 ongoing 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 carefully planned adaptive management and science-led monitoring facilitated the establishment of the world's first commercial open stream tidal turbine within a marine protected area (green energy vs. risks to marine biodiversity and ecosystem services).
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 the 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 an 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.

3 Main S&T results

3.1 BESAFE's general findings

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.

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

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.*

of arguments for biodiversity conservation (ethical, economic, etc.). The study found that, irrespective of their viewpoint 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-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. 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, socioeconomic 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. 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 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.

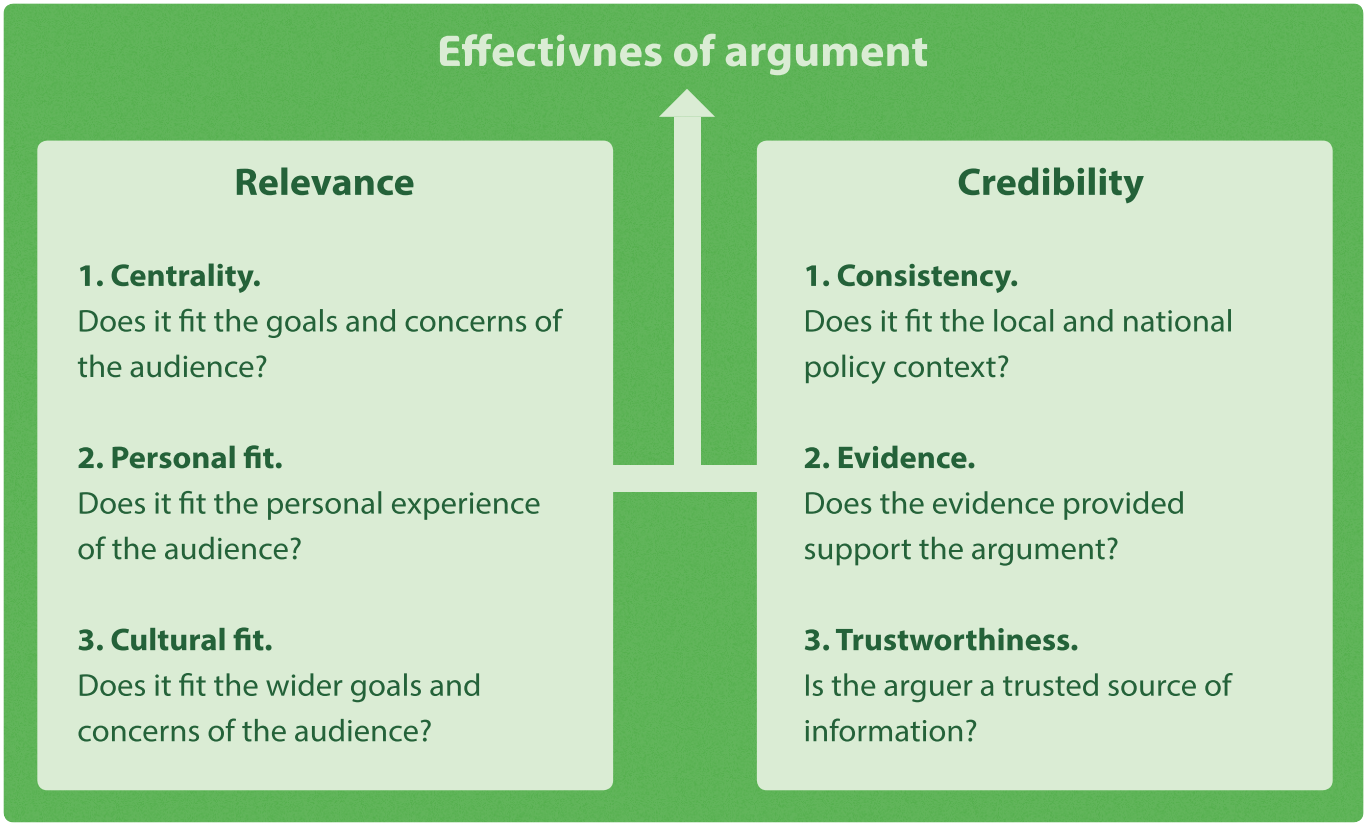


Figure 3. *Criteria for effective arguments (after Benford and Snow, 2000).**

- **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, 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.
- **Use positive framing.** Positively framed arguments (emphasising benefits of biodiversity) are often more effective than negatively framed ones (focusing on threats, risks and losses). 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.
- **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.

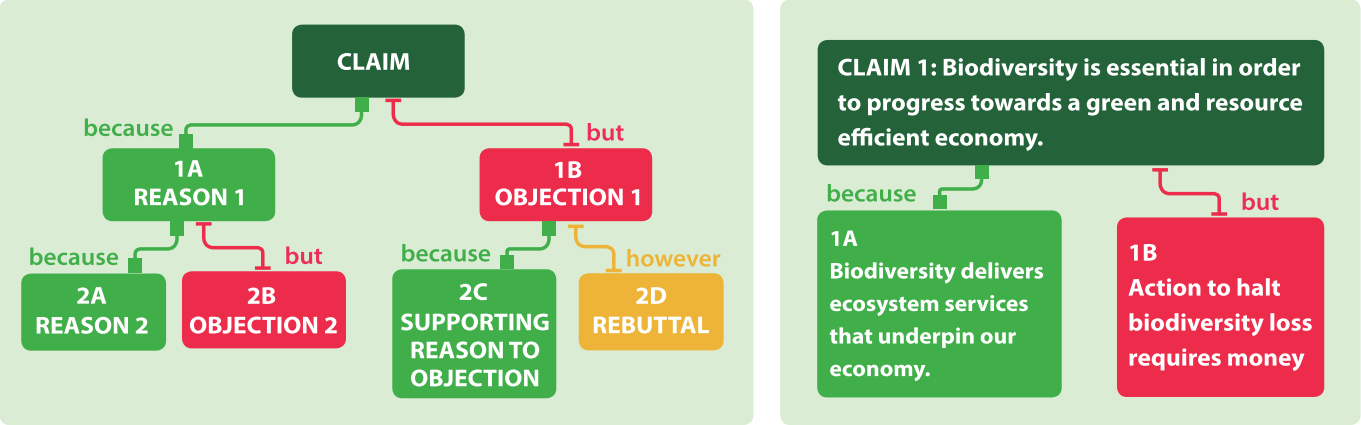


Figure 4. *Argument mapping and an example from the EU Biodiversity Strategy.*

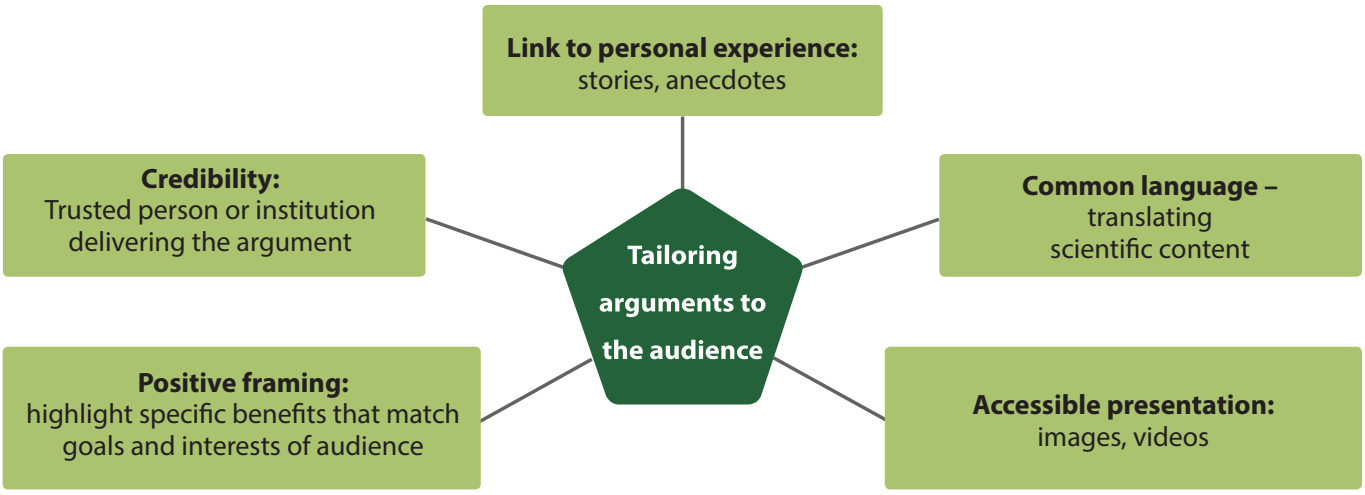


Figure 5. *Tailoring arguments to the audience.*

3.2 Conclusions and recommendations

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. 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 environmental impacts are continually reassessed in the light of new evidence and decisions made through constructive stakeholder dialogue) 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 can be useful positive arguments to provide additional support – 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 policymaking, 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.

3.3 The BESAFE Toolkit

The results from the research carried out in the project were used to produce a series of case study and thematic briefs. Each brief aims to explain projects results in a certain case study or on a certain subject to an interested public not necessarily familiar with biodiversity policy and argumentation. The briefs are accessible separately through a content list on the website. Together they form the BESAFE toolkit. The entire toolkit, consisting of all briefs and the contents list is also downloadable as a single pdf volume.

Overview of the toolkit briefs

I. Case study briefs

The case study briefs describe the results of the case studies that are already listed in section 2.

II. Thematic briefs

a) Briefs providing background knowledge

- **Biodiversity conservation using ideas and instruments of species protection.** Explains how ideas and instruments for species protection have evolved and contribute to an integrated biodiversity conservation strategy in Europe. The brief considers the roles of Red Lists of threatened species and the legal priority given to species listed in the Annexes of the European Commission Habitats and Birds Directives and the Appendices of the Bern Convention of the Council of Europe.
- **Biodiversity conservation using ideas and instruments of habitat and area protection networks.** Explains how ideas and instruments for habitat protection have evolved and contribute to an integrated biodiversity conservation strategy in Europe. The brief considers the protected areas designated and managed under the Habitats Directive of the European Commission and the Bern Convention of the Council of Europe, with reference to spatial networks and the conservation of biodiversity outside protected areas.
- **What is an argument?** Explains how an argument is constructed, and shows how much of an argument can be implied by the context in which it is used. To understand why an argument is effective or fails to convince, it is important to be aware that, to a large extent, its acceptance depends on factors such as stakeholder beliefs and interests and level of understanding of the issue.
- **Classification of values of biodiversity.** Provides an overview of and brief introduction to the wide range of values associated with biodiversity and ecosystems. It highlights that value is a multidimensional concept and has been classified according to economic as well as broader concepts of value. Furthermore, it shows how human values can be divided into economic and non-economic values, and emphasises that total economic value is by no means the same as total value, a common misconception often causing conflicts between economists, ecologists and other stakeholders.
- **Methods for assessing the economic values of biodiversity and ecosystem services.** Biodiversity and biodiversity related ecosystem services give rise to a wide range of different values of which some can be classified as economic while others are classified as non-economic. In this brief the focus is restricted to methods relevant for assessing the economic values of biodiversity and biodiversity related ecosystem services.
- **How biodiversity contributes to ecosystem services.** Summarises the evidence from a literature review on how biodiversity contributes to ecosystem services. It shows that conservation of biodiversity is essential if it is to continue to provide a range of services that humans need. It also underlines that careful management is needed to balance trade-offs between different services.

b) Briefs increasing general understanding of how argumentation works

- **Benefits of biodiversity.** Describes the many benefits associated with protecting biodiversity. These benefits can arise to people today and in the future, and to the natural world itself. Thinking about the benefits and the beneficiaries of biodiversity helps the construction of powerful arguments for conservation.

- **Argument as a process: dialogue, trust and credibility in biodiversity decision-making.** Explains how the argument process, involving multiple exchanges of views between actors along a timeline, creates a basis for human interactions that can be as influential on the effectiveness of the argument as its content. Particular aspects are illustrated by reference to some selected examples from the BESAFE case studies.
- **Bundling arguments.** Highlights some benefits of using combinations (bundles) of arguments to improve the effectiveness of argumentation for biodiversity conservation. Different stakeholders and actors often have different beliefs and interests and each may require more than one argument to be convinced. Using argument bundles also provides actors with a more nuanced picture, showing them new angles and increasing their knowledge.
- **Conditions for an effective argument.** Aims to help those arguing for biodiversity conservation to understand the most effective ways of communicating the importance of conservation under different circumstances. It summarises ten lessons learned in the BESAFE project about enhancing the effectiveness of arguments for conservation.
- **Governance of ecosystem services.** The need for conservation is increasingly justified using the concept of ecosystem services. For these ecosystem service arguments to be effective, they need to be understood and placed in the context where decisions are made. This brief outlines a broad classification of governance implementation mechanisms (referred to here as governance "modes") that was developed within BESAFE to aid understanding of decision-making regarding ecosystem services.
- **Recreation and biodiversity.** This brief explains how biodiversity can contribute in many ways to the service of recreation. The popularity and value of outdoor recreation can lead to powerful arguments for conservation. On the other hand, there can be conflict between the provision of recreational opportunities and conservation objectives.

c) Briefs providing direct practical advice

- **Communicating biodiversity arguments: strategies and techniques.** Provides basic guidelines on how to improve skills of communicating biodiversity and evidence-based information to wider audiences. Particularly, it highlights techniques relevant to biodiversity conservation argumentation aimed at policy/decision-makers and other stakeholder audiences, reflecting the insights gained from BESAFE.
- **Developing our capacity to build effective arguments.** Five key factors relevant to building effective arguments are identified and used to provide guidance to help develop capacity to argue successfully in different situations, involving different audiences.
- **Engaging stakeholders in biodiversity discussions: everything placed on the table.** Although the aim of working with stakeholders varies greatly according to the issue or project and why stakeholders are being involved in the first place, the work floor may best be described as a construction site where work is in progress. Working with stakeholders in a formal situation implies placing all the different arguments on the table, ensuring that the variety of their views is identified and also identifying and encouraging synergies. Construction sites tend to be there over a long time before being finished. This is also the case for working within stakeholder forums and events – the process demands time, management and follow-up.
- **How do we determine if an argument is effective.** BESAFE has empirically analysed the effectiveness of arguments for biodiversity conservation, by observing arguments at different policy stages, at different governance levels and among different stakeholder groups. The project has also considered potential effectiveness of arguments, drawing on informants' views on the effectiveness of arguments and by studying the logic of arguments. This brief summarises ways to analyse the effectiveness of arguments and lessons from our empirical analyses.

- **How to construct an argument? Tailor to audience.** The success of an argument for biodiversity conservation depends on how it is adjusted to different stakeholders' perceptions of the values of nature. This policy brief describes ways in which arguments can be tailored for the audience in order to increase their effectiveness in the biodiversity conservation process, based on the lessons learned in the 13 BESAFE case studies and through discussions with stakeholders.
- **Selecting arguments through the policy cycle.** It is important to understand that policy-making is an ongoing and open-ended process. This brief focuses on the policy cycle approach which is a useful way to divide policy processes into several stages. It defines the stages of the policy cycle and explains how different types of biodiversity arguments can be used at each stage.
- **Selecting the right frame for your goal.** It is crucial to understand that the way in which an issue is presented matters. This brief focuses on framing which is a central concept in understanding and interpreting actors' efforts to define and construct political issues. It defines the framing effect and explains how the effectiveness of arguments depends partly on how they are framed. In particular, positive framing (emphasising benefits) is often more effective than negative framing (focusing on threats and problems), especially when the framing is aligned to match the goals and interests of the target audience. The concept of ecosystem services is useful for framing arguments in a positive way, by emphasising the benefits of biodiversity conservation for humans.

3.4 The BESAFE web tool

The toolkit briefs described in the previous section form the base of the BESAFE web tool. The intention of the tool is to unlock the project's findings on the effectiveness of arguments for biodiversity to stakeholders in a user friendly way. The tool therefore was developed in close cooperation with our stakeholders who had the opportunity to express their views in three stakeholder workshops and to comment on the design of the web tool at several stages of its development. The draft web tool was presented to, and tested by, our stakeholders in the third stakeholder workshop which took place during the final project conference in Brussels in June 2015. The tool was subsequently refined and finally published online at http://tool.besafe-project.net/.

The web tool was set up using the WordPress platform, one of the most commonly used public domain Content Management Systems. Due to the use of this common system transferring the tool to other hosts and/or other parties willing to maintain and manage it should be relatively easy.

The main body of the tool consists of the information stored in the database that is a standard feature of each WordPress site. This information consists of the briefs in the BESAFE toolkit together with additional information from the BESAFE deliverables, guiding and explanatory texts and links to further information. The major added value of the tool is the addition of background information, a guidance system and a categorisation system for the information in combination with a search and filter facility, which enables stakeholders to access information of interest more readily.

The tool has been set up both as a means to unlock the project results for application by other stakeholders and researchers, and as a demonstration tool that could be adopted and extended by other parties after the project's end.

The web tool offers three ways or 'entrances' for exploring BESAFE's results: through the case studies, through the policy and decision making processes and directly through a 'search and filter' system. This makes the system suitable for browsing by inexperienced stakeholders with little prior knowledge of biodiversity

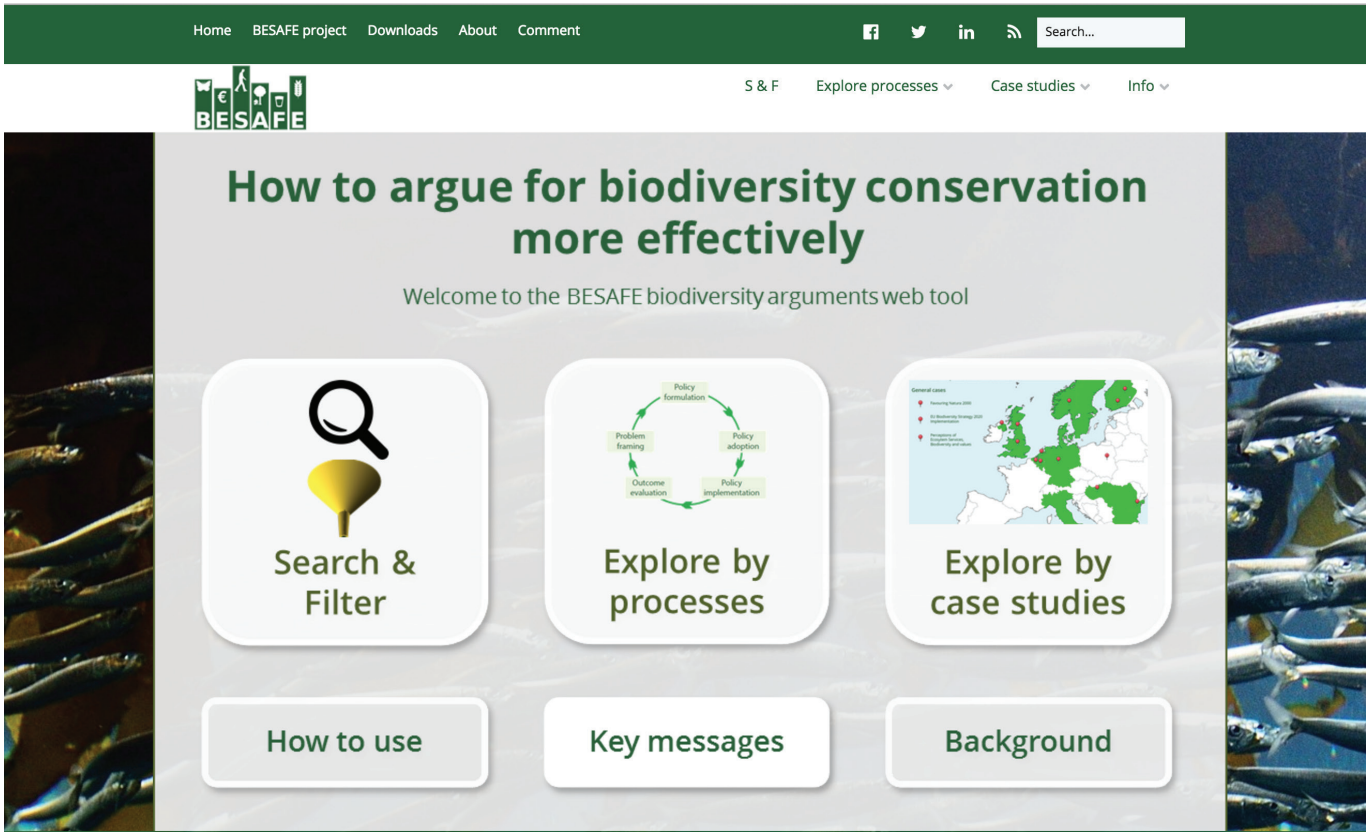
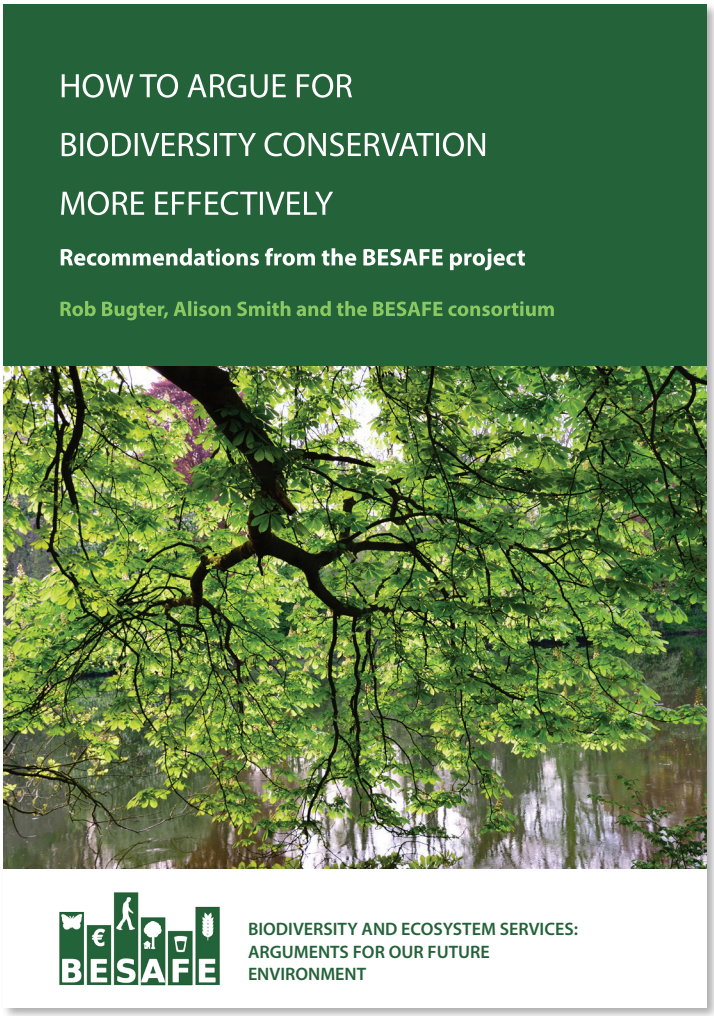


Figure 6. *The opening screen of the BESAFE web tool, showing the three entry points.*

policy making and argumentation, as well as for focussed searching by experienced users.

3.5 The BESAFE final policy brief

We produced a final policy brief brochure which is also the project's final brochure and executive summary. The brochure builds on the policy brief presented at the final conference and was extended to include a number of illustrations based on the case study findings following feedback from stakeholders.



4 Potential impact and main dissemination activities

The European Union's Biodiversity 2020 and Green Infrastructure strategies as well as the CBD's Aichi targets call for 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. BESAFE's 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. BESAFE's findings about the most effective use of arguments in this process help to increase the contribution of this process to biodiversity conservation.

Our results have also advanced the state of the art in the field of biodiversity argumentation and its effectiveness focusing on practical implications that are likely to be of considerable use to stakeholders in decision processes. This is supported by the practical impact derived from the BESAFE toolkit and web tool.

Furthermore, we have realised significant scientific impact through the publication of a large number of scientific papers. This includes advancing understanding of the operationalisation of ecosystem services and how they are underpinned by different biotic and abiotic attributes, the role ecosystem services can play in biodiversity protection and the way in which ecosystem service arguments can be used most effectively.

BESAFE also produced a diverse range of user-relevant outputs through which impact will be generated. All BESAFE results and outputs are described in the project's reports and deliverables which are all downloadable from the project website (www.besafe-project.net). The site has a media centre, a policy corner and separate sections for deliverables, publications and case study information.

4.1 Policy briefs and executive summary

To generate impacts, BESAFE produced several policy briefs in addition to those created at the end of the project for integration in the toolkit and web tool. The final policy brief has been published as a glossy magazine to help promote widespread interest.

The policy briefs have the following subjects:

- How have we advanced our understanding of the links between biodiversity, ecosystem functions and ecosystem services?
- What kind of information on ecosystem services is relevant for decision making, and how can we incorporate it in the decision making process?
- Arguments for biodiversity: a literature review.
- What works in arguing for biodiversity?
- How to argue for biodiversity conservation more effectively. Recommendations from the BESAFE project.

4.2 Keeping stakeholders, the scientific community and wider audiences informed

BESAFE conducted a number of dissemination activities that are expected to have considerable impact: Stakeholders and a large number of 'associates' from the scientific community were kept informed through BESAFE newsletters that are still available from the website. Wider audiences were kept informed by regular press releases, Twitter and Facebook messages. Popular articles were published in several countries and several media. Amongst those:

- **An effective argument**, published in International Innovation magazine in December 2012
- **Behind the scenes of BESAFE**, published in International Innovation magazine in November 2013.
- Interview on Swedish radio with Dr. Malgorzata Blicharska of SLU: Rosén, E. Den lönsamma naturen. Godmorgon världen, P1, Sveriges Radio, 27 September 2015.
- **Do ecosystem services really win arguments for biodiversity conservation? New report from BESAFE investigates**, an invited blog on valuing-nature.net published in October 2015.

Over its lifetime, BESAFE also organised two stakeholder workshops and a final conference annex stakeholder workshop. Reports on the first two stakeholder meetings are available as project deliverables and all presentations from the final conference are available from the policy user corner of the BESAFE website.

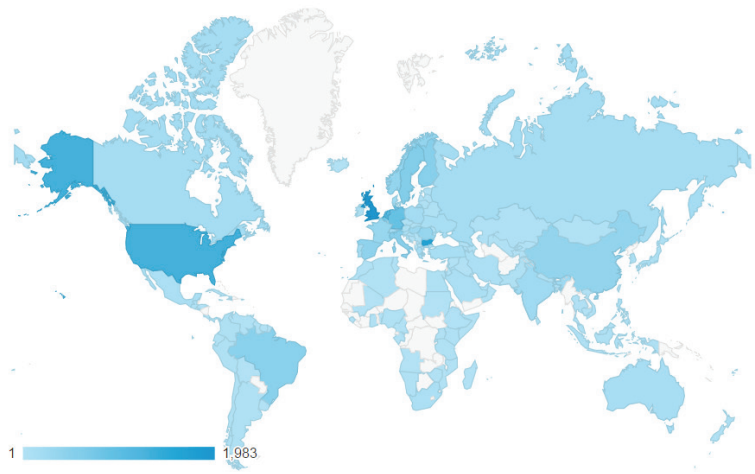
BESAFE website - scientific publications and project deliverables that are open to the public are available on the online website library. The News and Events sections was regularly updated with relevant job postings, article alerts, and announcements of general interest as well as forthcoming conferences and meetings.

From 1 September 2011 to 31 August 2015 the BESAFE website was visited by 10 223 users with a total of 15 498 sessions and 50 715 page views:

Sessions	Users	Page depth	Duration of sessions
15,498 (350 sessions/m)	10,223 (6,747 new/ 3,475 returning)	3.27 pages/session	00:03:32 average length per session

Website visits by country

1.	United Kingdom	**1,983(12.80%)**	6.	Belgium	**736(4.75%)**
2.	Bulgaria	**1,682(10.85%)**	7.	Sweden	**566(3.65%)**
3.	United States	**1,298(8.38%)**	8.	Finland	**509(3.28%)**
4.	Netherlands	**1,101(7.10%)**	9.	Italy	**497(3.21%)**
5.	Germany	**888(5.73%)**	10.	Brazil	**469(3.03%)**



The BESAFE website was visited by people from 141 countries, most visits coming from United Kingdom, Bulgaria, United States, Netherlands and followed by Germany, Belgium, Sweden, Finland, Italy and Brazil.

Social media: The BESAFE social media accounts in Facebook and Twitter have been actively used for promotion of project results. This resulted in a total of: 222 posts and 958 likes in Facebook; 241 tweets and 101 followers in Twitter; and, 65 members and 15 discussions started in LinkedIn.

4.3 Scientific papers, the BESAFE special issue and conference presentations

BESAFE already has produced a significant number of papers published in international peer-reviewed journals. An especially large impact on the scientific community is expected from the BESAFE Special Issue of Biodiversity and Conservation, to be published in 2016. This Special Issue will consist of 17 papers, representing the complete range of the project's findings. This will reinforce the international awareness and impact gained by the many project presentations on international and national conferences.

4.4 The BESAFE toolkit and web tool

BESAFE especially aims (and expects) to generate impact by unlocking its results to its stakeholders in a way that makes them easily accessible and of direct assistance to them.

This is done in two ways:

The BESAFE toolkit, described in the first section of this summary, offers practical information in a low-tech form consisting of downloadable briefs accessible through a simple guidance system (categorised contents list) on the project website. Stakeholders can also download the separate briefs, or the entire toolkit as a single volume and print it for themselves.

The BESAFE web tool, also described in the first section on this summary, offers more sophisticated access to the project's results. Users can navigate the content in several ways, have access to background information and are able to do focussed searches. The web tool also links to background and related information outside the project. Unlike the toolkit, the web tool can in principle be kept up to date and extended and have a large future impact.

4.5 Links to other projects, programmes and networks

Many BESAFE partners are involved in national and international initiatives for biodiversity protection. BESAFE members take part in several EU DG working groups (e.g. MAES, Green infrastructure, Nature Based Solutions). On several occasions, results based on the BESAFE project and the case studies proved to be useful to engage in the debate. In particular the discussion between the Member States and the European Commission on the implementation of the biodiversity targets at the Nature Conference (Implementation of the EU Biodiversity Strategy) held in Riga on 22 May 2015 where BESAFE was mentioned as an example project on how to manage possible trade-offs between conservation and ecosystem services. Having a set of convincing examples and case studies at hand in BESAFE, results were also used in a workshop on bee health organised by the European Agency for Food Safety in Brussels on 1 June 2015 to make the case for biodiversity in agricultural areas. So as a general observation is that

BESAFE results can make a difference in discussions among stakeholders on possible trade-offs between biodiversity conservation and green infrastructure development (ecosystem services). Furthermore, BESAFE members are involved in National Ecosystem Assessments (e.g. the UK NEA and UK NEA Follow-on Project; the Spanish NEA) and (inter)national TEEB's. In IPBES, BESAFE partners will use their experience and the project's results as Coordinating Lead Author and Lead Author for the European and Central Asia regional assessment and as coordinating lead author for the Policy Support Tools. Ongoing European projects that BESAFE partners are involved in are among others ESMERALDA, IMPRESSIONS, OPERA's and OpenNESS and the Horizon 2020 project eLTER. In OpenNESS, the work carried out on biodiversity and ecosystem service linkages has taken over from and builds upon the BESAFE WP4 review. Other projects and initiatives in which BESAFE partners will bring in their knowledge are LTER Europe, , ALTER-Net, IUFRO (BESAFE partner is deputy coordinator of IUFRO Working Party 9.05.04 "Forest policies in the Baltic and CEE region"), ESP (the Ecosystem Services Partnership, BESAFE and BIOMOT organized a joint session at the ESP conference in Costa Rica in 2014, and BESAFE organizes a full day session at the ESP conference in South Africa in November 2015), ACES (A Community on Ecosystem Services, BESAFE results were used in a plenary panel discussion on "Applying an Ecosystem Services Framework to Natural Resource Management: Accomplishments, Challenges and Opportunities", 10-14 December 2012, Fort Lauderdale, Florida, USA) and the European Commission's Stakeholder Platform on Large Carnivore's.

5 Address of project public website and relevant contact details

The BESAFE project involved 16 partners (table below). Further information on the project can be obtained from the project website (www.besafe-project.net) or by contacting the project coordinator, Rob Bugter, at rob.bugter@wur.nl.

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	National Environmental Research Institute (NERI) - Aarhus University, Denmark	Mette Termansen
eftec	Economics for the Environment Consultancy Ltd (EFTEC), UK	Rob Tinch
	Finnish Environment Institute (SYKE), Finland	Eeva Primmer
	University of Eastern Finland (UEF), Finland	Pekka Jokinen
	Szent István University, Hungary	Gyorgyi Bela
	Paris Lodron University of Salzburg (PLUS), Austria	John Haslett
	PENSOFT Publishers Ltd, Bulgaria	Pavel Stoev
	Research Institute for Nature and Forest (INBO), Belgium	Ann Van Herzele
JRC	Joint Research Centre - European Commission (JRC), EU	Joachim Maes
	The Norwegian Institute for Nature Research (NINA), Norway	Jiska van Dijk
	University of Bucharest, Romania	Nicoleta Geamana