Emerald Network status in the Eastern Partnership region and the Russian Federation

European Union/Council of Europe Cooperation on Nature Protection in the EU Neighbourhood Policy East Area and the Russian Federation, 2009-2016

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Contents

LIST OF ABBREVIATIONS	**4**
SUMMARY	**5**
1. PURPOSE OF THIS REPORT	**8**
2. BACKGROUND AND INTERNATIONAL POLICY OBJECTIVES	**9**
The Emerald Network	9
First Joint Programme (Phase I), 2009-2012	10
Second Joint Programme (Phase II), 2013-2016	12
Links to international biodiversity policy instruments	13
3. DEVELOPMENT OF METHODOLOGIES AND STANDARDS	**15**
4. SETTING UP THE FRAMEWORK	**17**
The process of network establishment	17
Results	20
5. ASSESSING IMPLEMENTATION PROGRESS	**39**
6. IMPACTS AT POLICY LEVEL, AND WIDER PUBLIC BENEFITS	**42**
Wider public benefits	45
7. REMAINING GAPS AND WEAKNESSES	**48**
8. CONTINUING ACTIONS AND FUTURE COOPERATION	**51**
Actions in the first dimension: identifying and designating sites	54
Actions in the second dimension: protection and management	55
Actions in the third dimension: communication	56
Final recommendations, including future cooperation	57
Proposal for immediate further phase of work in 2017-2020	58

List of abbreviations

ASCI	Area of Special Conservation Interest
CARDS	Community Assistance for Reconstruction, Development and Stabilisation
CBD	Convention on Biological Diversity
CDR	Central Data Repository
CoE	Council of Europe
DCW	Digital Chart of the World
DG	Directorate General
EaP	Eastern Partnership
EC	European Commission
ECDDA	European Common Database on Designated Areas
EEA	European Environment Agency
EIONET	European Environment Information and Observation Network
ENP	European Neighbourhood Policy
ENPI	European Neighbourhood and Partnership Instrument
ENRTP	Environment and Natural Resources Thematic Programme
ETC/BD	European Topic Centre on Biological Diversity
ETRS	European Terrestrial Reference System
EU	European Union
EUNIS	European Nature Information System
GEF	Global Environment Facility
GEO-BON	Group on Earth Observations Biodiversity Observation Network
GIS	Geographic Information System
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
IUCN	International Union for Conservation of Nature
MEA	Multilateral Environmental Agreement
NACRES	Centre for Biodiversity Conservation and Research (Georgia)
NBSAP	National Biodiversity Strategy/Action Plan
NGO	Non-Governmental Organisation
PEEN	Pan-European Ecological Network
SDF	Standard Data Form
SAC	Special Area of Conservation
SPA	Special Protection Area
TEEB	The Economics of Ecosystems and Biodiversity
UN	United Nations
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
WWF	World Wide Fund for Nature

ISO country codes		Biogeographic regions	
AL	Albania	ALP	Alpine
AM	Armenia	ANA	Anatolian
AZ	Azerbaijan	ARC	Arctic
BA	Bosnia and Herzegovina	ATL	Atlantic
BY	Belarus	BLS	Black Sea
CH	Switzerland	BOR	Boreal
GE	Georgia	CON	Continental
ME	Montenegro	MAC	Macaronesian
MD	Republic of Moldova	MED	Mediterranean
MK	"The former Yugoslav Republic of Macedonia"	PAN	Pannonian
NO	Norway	STE	Steppic
RS	Serbia		
RU	Russian Federation		
UA	Ukraine		

Armenia

Summary

This report presents the results of two consecutive programmes designed to improve biodiversity conservation in the Eastern Partnership countries (Armenia, Azerbaijan, Belarus, Georgia, the Republic of Moldova and Ukraine) and the Russian Federation, through the setting up of the Emerald Network of nature protection sites. The programmes ran from 2009-2016 and were operated jointly by the European Union and the Council of Europe. The report reviews the results achieved, the lessons learned and the indications of likely longer-term impact. It concludes by specifying a number of remaining actions required and opportunities for further cooperation.

Knowledge about the value of networks of area-based measures for nature conservation is growing all the time; in terms of the ecological resources they protect, issues of functional connectivity in the landscape, concepts of completeness and coherence, management effectiveness, long-term sustainability (including in the face of climate change), and wider social benefits. Operating the Emerald Network together with the EU's Natura 2000 Network in a coordinated way and to common standards is the key to achieving this on a pan-European scale. The joint programmes have been well timed to make significant progress towards this goal.

During the second phase in 2013, Belarus was able to conclude the process of becoming a full Contracting Party to the Bern Convention, as a direct result of engaging in this work. The Russian Federation, although not yet a Party, has participated fully throughout, and has strengthened its collaborative links in the process.

The work undertaken through the joint programmes involved significant efforts to mobilise new teams of people, design data handling protocols, collect data, compile databases, initiate new field surveys and produce peer-reviewed consensus conclusions about the sites to be added to the network.

A remarkable degree of technical cooperation has been achieved. The European Environment Agency and the Council of Europe together successfully harmonised (and enhanced) the complex scientific & technical methods and standards required for a fully integrated approach, including lists of priority species and habitats, recording formats, coding systems, spatial data tools and database software. Information from the countries was pooled on-line in the EEA's Central Data Repository, which vastly increased the efficiency of subsequent access and analysis.

Levels of engagement by government authorities varied but were generally good. Equally important to the success of the programmes however has been the breadth and depth of engagement by other stakeholders, including research scientists and NGOs – this was very extensive, despite many eastern countries previously having only a limited history of this kind of cooperation. The level of public awareness achieved also bodes well for the future.

Mutual learning and experience-exchange was also a strong feature, both between countries and within countries. As well as improved knowledge about the distribution and status of habitats and species, the skills, experience, collaborative connections and other capacities developed through the joint programmes make it likely that those concerned will be effective contributors not only to Emerald implementation but to many other conservation initiatives for a long time to come.

From an early stage it was clear that if site selection was to be based only on existing networks of protected areas, the resulting coverage would be insufficient to meet the requirements of the Emerald Network. This stimulated complex new efforts in some countries to negotiate a good understanding of the principles involved and to research new sites to add.

At the end of the first joint programme (2012) a total of 959 candidate sites had been identified, with a combined area of over 357,000 km^2. By the end of the second programme (2016) this had risen to 2,214 sites covering 624,262 km^2. The sufficiency of these proposed sites for achieving the "favourable conservation status" objectives of the Emerald Network was assessed through a biogeographic evaluation process modelled on that used in the EU. Six evaluation seminars took place in 2015-16, analysing sufficiency in terms of (i) individual countries, (ii) biogeographic regions and (iii) species and habitats.

Emerald Network sites in Armenia

Emerald Network sites in the Republic of Moldova

Emerald Network sites in the Russian Federation

In quantitative terms, the sites proposed represent an average of 12.6% of the national territory of the seven countries. This compares reasonably well with the terrestrial/inland global target of 17% agreed in the Strategic Plan for Biodiversity (Aichi Target 11); and in Armenia and Azerbaijan's case, they already exceed it. Assessed on a biogeographic basis, there are some considerable differences in candidate site area coverage between the different biogeographic regions, and these are detailed in section 4 of the report.

The qualitative findings were also largely positive. In a few countries the site proposals left important gaps in spatial distribution and/or under-represented the ecological role of smaller sites, but some good efforts were made in latter parts of the programme to address these aspects. Assessed in terms of individual priority habitats and species, the sufficiency picture is quite variable (with some of the variation being influenced by country size); but overall the relevant interests appear to be quite successfully encompassed within the sites proposed for the network. Birds are the best represented group (thanks to generally more extensive available data), and small countries have achieved good sufficiency quicker than large ones, although Ukraine already scores very highly despite its large size.

Once candidate sites have been through the sufficiency evaluation process, they pass to the Bern Standing Committee for formal adoption as Emerald sites. It is then for the relevant national governments to designate them as such. Two of the joint programme countries (Belarus and Ukraine) have completed this process, which represents a good achievement given that only one other Emerald country elsewhere (Switzerland) has done so to date.

One major section of this report provides a detailed analysis of the progress achieved so far with the establishment of the Emerald Network in comparison with the progress achieved so far with the Natura 2000 Network in the countries of the EU. The results of this testify to an extremely committed and rapid uptake of the concepts, objectives and processes associated with network establishment in the Emerald countries, comparing very favourably to the record over a much longer period in the Natura 2000 countries.

In terms of quantitative network coverage, while there is quite a span of variation in the figures, most of the Emerald countries have already achieved results that are comparable to those in the EU, with some going considerably further. The picture with regard to documentation of species and habitats is more mixed; while the Emerald Network is currently weaker in terms of qualitative sufficiency, this is set to improve when the latest evaluation data come through. With further support and assistance it is fully reasonable to expect that before long there can be parity of achievements between the Emerald countries and the EU countries, such that the resulting networks perform in the integrated pan-European way intended.

Success of the Emerald Network cannot be achieved by designations alone, but depends on securing defined conservation outcomes for the relevant species and habitats. Following designation of the sites, governments are expected to ensure that an appropriate regime for protection, management and monitoring is applied. It will not be possible to review the actual conservation outcomes achieved with this until more countries have completed the designation stage, but for the time being, some progress on putting in place the requisite enabling mechanisms (such as legal protection and management frameworks) is discussed in section 5.

Section 6 more generally examines ways in which the two joint programmes have been the driving force for new improvements in relevant national strategies, laws, policies and projects in the target countries, and it discusses the wider benefits for the public at large that have so far become apparent, and which are foreseen to grow in importance in future.

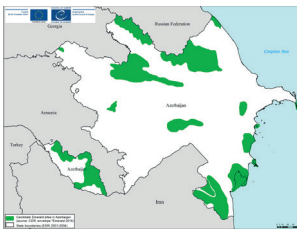
The instances described in section 6 provide an illustration of the way in which practical project implementation can have a profound impact on strategic and long-term frameworks of policy and law. This is an important form of impact which occurs from ground-level activity "upwards" to the overall orientation of a government's enduring aims and attitudes. It shows how practice can become translated into policy. It also makes it more likely that strategies and policies will be grounded in sound science that has been tested and validated in real life situations, which in turn gives a basis for greater political confidence in the directions being chosen. This is an important lesson for technical assistance programmes in general.

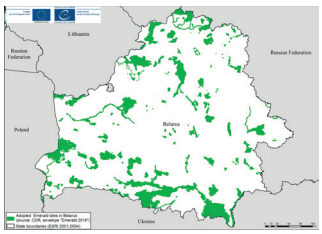
Concerning future priorities, the findings from the biogeographic evaluation seminars show where further work is required, and an overview of this is given in section 7, with recommendations for action set out in section 8. These include a need to make adjustments to the two Bern Convention Resolutions that list priority habitats and species requiring conservation attention, since those lists are not yet comprehensive in their coverage of important interests that have a particularly eastern distribution.

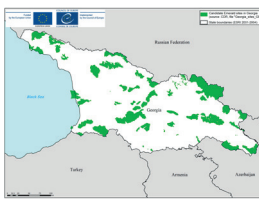
The Convention's Standing Committee agreed a "Calendar for the implementation of the Emerald Network 2011-2020" in 2011 and updated it in 2015; and then in 2016 it endorsed a "Road Map" of specific actions for the remaining period (to completion of the Network in 2020) which had been produced by the Final Conference of the second Joint Programme. This Road Map is reproduced in section 8.

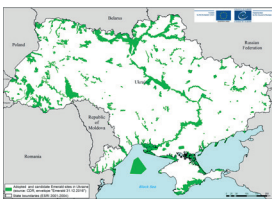
The final recommendations of this report are presented as a structured proposal for a further phase of support from the European Union to complete key aspects of the tasks remaining; principally for putting in place the final sites that will complete the Network (including the necessary final biogeographic evaluation processes), and providing a sound basis for implementing the on-going protection, management and monitoring of the sites.

With the target completion date of 2020 rapidly approaching, and with a need to avoid losing the momentum that has been built up by investments made so far, there is a key opportunity now to launch a rapid follow-on phase of joint work. Then finally, within the foreseeable future, this may bring to full reality a complete and effective Emerald Network, playing its crucial part in the pan-European conservation effort. The future of Europe's wildlife and habitats depends on this.


Emerald Network sites in Azerbaijan


Emerald Network sites in Belarus


Emerald Network sites in Georgia


Emerald Network sites in Ukraine

Azerbaijan (R. Allahverdiyev)

1. Purpose of this report

This report comes at the culmination of two consecutive programmes to improve biodiversity conservation in the Eastern Partnership countries (Armenia, Azerbaijan, Belarus, Georgia, the Republic of Moldova and Ukraine) and the Russian Federation, through the setting up of the Emerald Network of nature protection sites.

The programmes were run jointly by the European Union (EU) and the Council of Europe (CoE), and ran from 2009 to the end of 2016. A synthesis of their results is presented here, including the progress they achieved and the outcomes apparent so far, as well as indications of likely longer-term impact. The report identifies lessons learned from this work, and then specifies a number of remaining actions required and opportunities for further cooperation in the future. It therefore looks forwards as well as backwards.

Part of the purpose here is therefore to record the achievements of the cooperation between the institutions involved (including the Bern Convention and the European Environment Agency), and part is to frame some priorities for the way ahead. The report is also, however, an opportunity to reflect on the experience of the cooperation itself (for example in harmonising scientific standards and methodologies on a pan-European basis).

The lessons emerging relate to experiences in positive engagement of the seven target countries for effective international measures for nature conservation, but also to the evolution of stronger national policy and legal provisions for ensuring sustainable long-term protection and management of the resources at stake. This report therefore aims to present findings which should have applicability to some extent beyond the scope of the Emerald Network programmes themselves.

Given the ingredients described above, this report should provide an important part of the context for planning future cooperation in the field of nature protection more generally between the CoE and the EU.

Belarus (Y. Solovjev)

2. Background and international policy objectives

The Emerald Network

Protected areas are a vital contribution to the conservation of the world's natural resources. Their values range from the protection of natural habitats and associated flora and fauna, to the maintenance of environmental stability of surrounding regions, the protection of ecosystem services, and the mitigation of climate change. They also produce wider economic and social benefits for society.

Ecological networks of protected areas can positively influence the conditions for the survival of species populations in the fragmented natural areas and human-dominated landscapes in Europe. They also allow for sustainable use of natural resources through the interconnectivity of their physical elements with the landscape and with existing social and institutional structures.

The "Emerald Network", under the 1979 Bern Convention on the Conservation of European Wildlife and Natural Habitats, is set up to ensure that all areas of high biodiversity importance in Europe are identified, their ecological values are documented and their significance is recognised in legal terms. The aim is for the identified Emerald Network sites to receive adequate protection to support the long-term survival of the species and habitats, while allowing human social and economic activities to continue and, at the same time, encouraging sustainable human-nature interaction at the same time.

The European Community, in addition to its individual Member States, is a Contracting Party to the Bern Convention in its own right. The fulfilment of its obligations arising from the Convention rests on the implementation of the 1979 Wild Birds Directive (79/409/EEC) and the 1992 Habitats Directive (92/43/EEC).

The Emerald Network is an equivalent of the "Natura 2000 Network" initiative established in the context of the EU Directives. The two networks are fully compatible with each other and use the same methodology and information tools. The main differences concern their legal foundations and the territories to which they each apply (European Union Member States in the case of the Directives, and the whole of Europe and parts of Africa in the case of the Convention). For Bern Convention Parties, setting up the Emerald Network at the national level is considered to be one of the main mechanisms that enable them to comply with the obligations they have accepted under the Convention.

In the EU, coordinated and collaborative approaches among Member States are considered to be the most suitable answer to the loss of biodiversity, in particular within the shared biogeographical context. The Emerald Network similarly represents a useful tool for the conservation of areas of great ecological value and a framework for co-operation across the whole continent. By applying similar methods to the whole pan-European area it can be expected that the level of protection enjoyed by the species that move across frontiers will improve. The Emerald Network thus promotes the coherence of species and habitat conservation standards throughout the European continent and its shared biogeographical regions.

According to Article 4.1 of the Bern Convention, each Contracting Party shall take appropriate measures to ensure the conservation of (i) natural habitats that are endangered and (ii) the habitats of wild flora and fauna, especially species listed in Appendices I and II of the Convention. Under Article 4.2, Parties are to use their planning and development policies to avoid or minimise deterioration of the areas they protect for the purposes of Article 4.1. Articles 4.3 and 10.1 require coordinated special efforts in respect of areas of importance for migratory species.

In 1989 the Standing Committee of the Bern Convention adopted a Resolution and three Recommendations on habitat conservation, including Recommendation No. 16 on the development of a network of "Areas of Special Conservation Interest» (ASCIs). The process of setting up this network then paused for a few years while the European Community (now the European Union) brought into operation its Natura 2000 network, so that coherence between the two networks could be assured.

In due course the Bern Standing Committee agreed Resolution No. 3 of 1996, which effectively re-launched the ASCI network with the new short-form name of "Emerald Network"[1]. Resolution No. 5 of 1998 subsequently confirmed that in the case of Member States of the EU (all of which are Contracting Parties to the Bern Convention) their Natura 2000 sites constitute their contribution to the Emerald Network. By the same token, thanks to harmonisation of the two processes, the Emerald Network effectively constitutes an extension of the Natura 2000 network to European non-EU countries. Hence a coherent pan-European system has been created.

Moreover, by virtue of Resolutions No. 3 of 1996 and No. 5 of 1998, participation in the Emerald Network has been invited from European countries which are not yet Parties to the Convention, and from Parties to the Convention lying outside Europe. As a non-Party observer State the Russian Federation has participated actively in the process since 1999, and the involvement of Belarus led directly to that country becoming a Party during the project period in 2013 (see section 6 below).

First Joint Programme (Phase I), 2009-2012

Prior to the two Joint Programmes described here, pilot projects in 20 non EU-countries to assist with the implementation of the Emerald Network took place from 1999 to 2002, serving also to prepare the ground in terms of nature protection for moves towards EU accession by the countries concerned. A further round of projects took place in 2005 to 2009 in South-East Europe, and resulted in the identification of sites and the delivery of scientific data in Albania, Bosnia-Herzegovina, Croatia, Montenegro, Serbia and "the former Yugoslav Republic of Macedonia".

In the countries of Central and Eastern Europe and the South Caucasus, pilot projects were also undertaken, in the Russian Federation (1999, specifically in Karelia), the Republic of Moldova (2000), Ukraine (2001), Georgia (2002), Azerbaijan (2005), and Armenia (2007). These pilot projects were instrumental in mobilising and uniting various experts in national teams, and in developing and harmonising methods, including standard software for building a common database. The pilot projects highlighted the need for a coherent approach in the collection of scientific data, much of which was outdated or in need or verification. They also exposed a need for lists of species and habitats to be updated (particularly in the Caucasus), in order to make the application of the site selection criteria more relevant.

The first EU/CoE Joint Programme on the Emerald Network for Central and Eastern Europe and the South Caucasus (reference DCI-ENV/2008/149-825) was entitled "Support for the implementation of the Convention on Biological Diversity Programme of Work on Protected Areas in the EU Neighbourhood Policy East Area and Russia: extension of the implementation of the EU's Natura 2000 principles through the Emerald Network". A link with the Convention on Biological Diversity (CBD) was therefore explicit from the outset (this is discussed further below).

1. For an overview and principal texts, see Bern Convention (2016a). The Emerald Network: A Network of Areas of Special Conservation Interest for Europe - Explanatory document and compilation of relevant texts. Document T-PVS/PA (2016) 4, prepared in the context of the Group of Experts on Protected Areas and Ecological Networks, Strasbourg, June 2016.

The geographical scope of the Programme corresponded to the eastern countries of the EU European Neighbourhood and Partnership Instrument (ENPI), namely Armenia, Azerbaijan, Belarus, Georgia, the Republic of Moldova, the Russian Federation and Ukraine. In the case of the Russian Federation it was agreed that the Programme would relate to the European part, defined as extending eastwards as far as the eastern administrative boundaries of the regions of Nenetsia, Komi, Perm, Bashkortostan and Orenburg (approximating to the line of the Ural mountains). The Council of Europe was the formal implementing institution.

The **agreed objectives** of this first Joint Programme were as follows:

(i) To identify potential Areas of Special Conservation Interest for the Emerald Network in Armenia, Azerbaijan, Belarus, Georgia, the Republic of Moldova, Ukraine and the European part of the Russian Federation, and to submit the resulting national lists of sites for consideration and adoption by the Standing Committee of the Bern Convention.

(ii) Compilation of data:

- Provision of data on distribution per biogeographical region in each country of all species and habitats of Resolutions No. 4 (1996) and No. 6 (1998) of the Bern Convention and Annex I of the Habitats Directive;
- Provision of distribution maps of selected species and habitats in a geographic information system GIS;
- Coding of digital boundaries for all sites in GIS;
- Provision of information on the following aspects for each site:
  - important species;
  - general site character, type of land cover, quality, importance, vulnerability;
  - ownership;
  - protection status at national and regional level;
  - information on impacts and activities in and around the site;
  - a map of the site.
- Development of a Sites database for the sites to be listed with all ecological data filled in, forming a regionally integrated and consistent Emerald database, which is to be delivered to the European Environment Agency (EEA) and its European Topic Centre on Biological Diversity (ETC/BD) for checking and integration in the European data base, to ensure the coherence and compatibility of data within the various biogeographical regions and with the data of the neighbouring sites of Natura 2000.

(iii) Countries to start the elaboration of integrated management strategies for land, water and living resources for the identified sites, promoting the ecosystem approach supported by the CBD, in view of ensuring conservation and sustainable use. Needs for the development of legislation and basic procedures will be supported.

(iv) To identify possibilities for enhanced regional cooperation.

(iv) To encourage the accession of Belarus to the Bern Convention.

A no-cost extension to the Programme was granted in late 2011, allowing it to continue for an extra 4 months until mid-April 2012, so that further work on data issues could be completed, principally in the Republic of Moldova and Azerbaijan.

Emerald Network leaflet in Armenian, Azeri and Georgian

Second Joint Programme (Phase II), 2013-2016

The second Joint Programme (reference DCI-ENV/2012/289-173) was entitled "European Union – Council of Europe Joint Programme for the preparation of the Emerald Network of Nature Protection Sites, Phase II", and it covered the same ENP countries as in Phase I. Implementation was framed by the Emerald Action Plan (2011-2020).

The **agreed objectives** of this second Joint Programme were as follows:

(i) To achieve a full operational launch of the Pan-European Emerald network of nature protection sites by 2020, thereby (i) supporting the implementation of the UN Convention on Biological Diversity and its Aichi Targets on protected areas (see below) by the ENP East countries and the Russian Federation and (ii) aligning nature protection standards in this region with the standards of EU and its Natura 2000 Network.

(ii) To identify the remaining potential Emerald sites in all target countries and complete the ecological databases in these countries:

- Further development of detailed guidelines on site selection and evaluation in respect of certain taxonomic groups (e.g. birds, fish) and environments (e.g. marine);
- Identification of further qualifying sites in the countries;
- Data collection and ecological description of sites, including:
  - a sites database for the potential Emerald sites with all relevant ecological data, including information on general site character, quality, importance and ownership of the site;
  - digital boundaries for all proposed Emerald sites in GIS;
  - distribution maps of selected species and habitats in GIS;
  - population estimates and distribution per biogeographical region in each country of all species and habitats listed in Resolution No. 4 (1996) and Resolution No. 6 (1998) of the Bern Convention and in Annex I of the Habitats Directive;
  - site protection status at national and regional level.

(iii) To assess the potential Emerald sites in all seven target countries in terms of their sufficiency for ensuring the long-term survival of the Bern Convention species and habitats.

- Preparation of the ecological and technical data delivered through the first project and correction of gaps if relevant for the beginning of Phase II; production of a reference database per biogeographic region for all species and habitats; quality assessment of the data delivered by the first project in 2011;
- Assessment of the sufficiency of the proposed Emerald sites to ensure the long term survival of species and habitats (in collaboration with the European Environment Agency and the European Topic Centre on Biological Diversity) through biogeographical and bilateral seminars; adjusting the size and/or number of proposed Emerald sites in individual countries where necessary
- Following sufficiency evaluations, production of an agreed Reference List of the species and habitats present in each biogeographic region.

(iv) To develop and to begin using guidelines on the national designation, management and monitoring of the adopted Emerald sites.

(v) To improve trans-boundary cooperation in the region through the process of setting up the Emerald Network; especially in respect of the conservation of sites which straddle country borders.

(vi) To give attention to other issues such as profile-raising for the Emerald Network at national level, climate change mitigation and adaptation, forest fire prevention, and supporting local ownership and public participation in the management of nature protection, *inter alia* through transparent information sharing and reporting.

Emerald Network leaflet in Romanian, Russian and Ukrainian

Links to international biodiversity policy instruments

The Emerald Network provides a key mechanism for implementing simultaneously several internationally agreed sets of commitments for the conservation of biological diversity. The work done within both Joint Programmes has been designed to strengthen the target countries' ability to meet these commitments.

With the exception of the Russian Federation, which has not yet acceded to the Bern Convention, all of the target countries are Contracting Parties to the Bern Convention, the Convention on Biological Diversity (CBD) and the Ramsar Convention on Wetlands. The implementation of the Emerald Network (specifically the wetland-related component of it in the case of Ramsar) constitutes a major part of the way in which these countries are able to implement the provisions for area-based conservation measures (including protected areas) under these Conventions. Furthermore, the alignment of the Emerald process (and the requisite standards involved) with the EU Birds and Habitats Directives allows countries considering accession to the EU to be able to meet the Natura 2000 designation requirements under those Directives, should they eventually become Member States of the Union.

Two successive Memoranda of Cooperation have been signed between the Bern Convention and the CBD in 2001 and 2008, formalising the shared interests of these two Conventions in matters including collaboration on the implementation in Europe of the CBD Programme of Work on protected areas.

The CBD Programme of Work on protected areas was first adopted in 2004 and had the overall aim of establishing and maintaining comprehensive, effectively managed and ecologically representative national and regional systems of protected areas, that collectively (*inter alia* through a global network) contribute to achieving the global objective of significantly reducing biodiversity loss. The target was for this to be achieved by 2010 for terrestrial areas and by 2012 for marine areas.

Significant reduction in the rate of biodiversity loss, to which these systems of protected areas were intended to contribute, was itself an international target adopted in 2002. CBD Parties committed themselves to "achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on Earth". The target was subsequently endorsed by the World Summit on Sustainable Development and the UN General Assembly, and was incorporated into the Millennium Development Goals.

In Europe, EU Heads of State at their Gothenburg summit in 2001 had already agreed (prior to the CBD decision) that biodiversity decline should be "halted", with the aim of reaching this objective by 2010. In 2003 at the fifth Ministerial Conference "Environment for Europe", Environment Ministers and other representatives of 51 countries in the UNECE region (plus the European Commission) adopted a Resolution (ECE/CEP/108) in the context of the of the Pan-European Biological and Landscape Diversity Strategy (PEBLDS), which reinforced the objective of halting the loss of biological diversity at all levels by 2010, working towards it through concerted actions, national efforts and regional cooperation.

Specific targets in this European commitment included identifying a Pan-European Ecological Network by 2006 (including core areas, restoration areas, corridors and buffer zones as appropriate) as a contribution towards a global ecological network; achieving adequate conservation of the core areas by 2008, and establishing the full Network by 2015. An appended statement encouraged the Central and Eastern Europe States and the Newly Independent States to give particular attention to the implementation of the Network "in synergy with the Bern Convention Emerald Network and Natura 2000".

The commitments above therefore provided part of the international policy context for the first EU/CoE Joint Programme on the Emerald Network. While implementation of this Joint Programme was underway, and adding therefore to the context for the "Phase II" programme, the CBD Parties in 2010 (acknowledging that the "2010 target" had not been met) adopted a Strategic Plan for Biodiversity 2011-2020. The 20 "Aichi Biodiversity Targets" in this Plan have since also been endorsed in other international fora.

Target 11 of the Biodiversity Plan foresees that "by 2020, at least 17 per cent of terrestrial and inland water areas, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes".

In 2011 the European Commission adopted a Biodiversity Strategy (COM (2011) 244 final) which also has a time-horizon of 2020. By this date it expects to see full implementation of the Birds and Habitats Directives, and this aim is reinforced by measurable targets on improving the conservation status of habitats and species under both Directives. The third of these targets furthermore foresees that by 2020, "ecosystems and their services are maintained and enhanced by establishing green infrastructure and restoring at least 15% of degraded ecosystems".

The EU/CoE second Joint Programme therefore constitutes a fully consistent vehicle with which to apply these various objectives in the Eastern Partnership countries and the Russian Federation. It was also relevant to several of the priorities in an EU thematic programme for external cooperation known as the Environment and Natural Resources Thematic Programme (ENRTP). This ran from 2011-2013 and was intended *inter alia* to reinforce efforts made towards halting the loss of biodiversity and the degradation of ecosystems, as well as supporting the capacity of the EU's neighbouring countries to implement commitments under multilateral environmental agreements such as the CBD and the Bern Convention.

Georgia

3. Development of methodologies and standards

Throughout the two Joint Programmes, considerable care was taken to design technical approaches that were fully consistent with those already in use for the establishment of the Natura 2000 network and for biodiversity monitoring in the European Union. In several of the project countries this involved specific efforts to align the national methods and standards used so that they harmonised with those used in the EU. This was particularly important for example in the case of habitat recording in post-Soviet Union countries, where national habitat classifications initially diverged considerably from contemporary approaches used in the EU.

At the programme level this was guided by close collaboration between the Council of Europe and the European Environment Agency, within the framework of a pre-existing Memorandum of Cooperation between the two institutions. An early technical meeting was held in 2009 to elaborate the particular contribution of the EEA's European Topic Centre on Biological Diversity (ETC/BD) to the monitoring and analysis of data to be provided by the project countries as the basis for identifying potential sites for the Emerald Network.

A basis for collaboration on common standards already existed from previous projects, notably the one undertaken for the development of the Emerald Network in South-East Europe, under the CoE/EU programme on Community Assistance for Reconstruction, Development and Stabilisation (CARDS). This previous collaboration was also capitalised upon in securing assistance from the EEA for the Joint Programmes' biogeographical evaluation process (see section 4 below) in respect of the regions which had also been covered by CARDS. The ETC/BD more generally assisted with the processes of scientific assessment of proposed Emerald sites at national level, and the handling of GIS distribution data on species and habitats.

It was agreed that the EEA would use its enhanced tools to facilitate data flows from the previous Emerald Network projects and the new Joint Programme into the Agency's databases. The Agency would also provide expertise and technical assistance for the work involved in modifying the lists of species and habitats in the Bern Convention Resolutions on the Emerald Network, in order to ensure good coherence in this respect between the Emerald and Natura 2000 networks.

Accordingly during 2010-2011 a common list of proposed species and habitats was prepared for use in reviewing the existing lists, and a Standard Information Form was developed for each of the species and habitats, based on the Information Form used for Natura 2000. Particular attention was given to harmonisation between the species coding system developed by the Council of Europe and that used for Natura 2000 in the European Nature Information System (EUNIS).

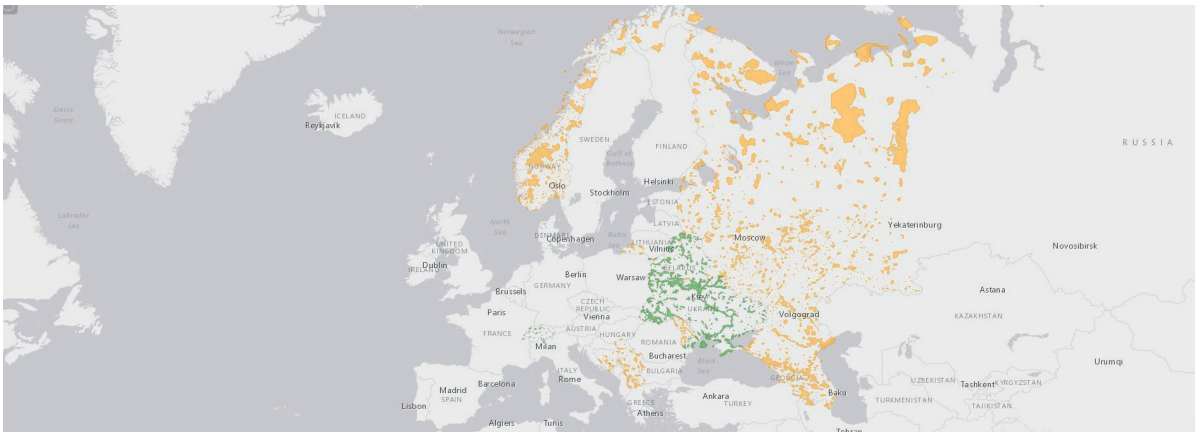
Special attention was given in all the Phase I workshops to the alignment of existing habitat data with the new version of the Bern Convention Resolution No. 4 (1996), using the EUNIS habitat classification. Countries found the EUNIS ecosystem-based guidelines helpful in this regard (although the classification does not yet cover all the habitat types found in the project countries - see section 7 below).

Similarly, new designation codes were devised for describing the legal protection system in place at the national level for protected areas, in line with the principles of the European Common Database on Designated Areas (ECDDA). These were added to the Emerald software in order to update it with new information on the protection status of the proposed Emerald sites. The ecological characteristics and protection status of all potential sites for the Network were thus documented using Emerald software matching the Natura 2000 software.

In relation to spatial site delineation data, these have been uploaded by countries to the EEA's Central Data Repository (CDR), but with varying coordinate reference systems. In order to make this more standardised for the purposes of calculating the total area of Emerald sites per country (see discussion of results in section 4 below), all the data was projected to the ETRS 1989 coordinate reference system (Lambert Azimuthal Equal Area projection) and areas (including marine areas) were recalculated using GIS, and correcting to avoid double-counting of overlap areas. Country areas were calculated using the open-source Digital Chart of the World (DCW) (and in the case of the Russian Federation, only the European part as defined in section 2 above was used). Area figures for the extent of biogeographical regions were obtained direct from the EEA.

All the efforts towards harmonisation of data standards described above then enabled the data to be delivered into the CDR, which organises datasets and reports for each country according to relevant reporting obligations and agreements, including the Bern Convention. Use of the CDR has allowed the data to be submitted (directly by the national Emerald teams) online, via the web portal of EIONET (the European Environment Information and Observation Network)[2] at http://cdr.eionet.europa.eu/ . The Secretariat can then access it in a centralised and standardised way. This arrangement has been one of the most significant technical facilitating steps achieved by the Programme.

The EEA is now working on adapting the on-line "Natura 2000 viewer" (http://natura2000.eea.europa.eu/#) with a view to presentation of Emerald Network sites in the same way as is currently done there for SPAs and SACs. A draft version of this can currently be accessed at http://wab.discomap.eea.europa.eu/webappbuilder/apps/28/.



Emerald Network Viewer

In addition to establishment of the Network, guidance in respect of management, monitoring and reporting for Emerald sites (see section 5 below) has followed the same principles and standards of good practice as those developed for Natura 2000.

Overall, the two Joint Programmes have demonstrated extremely successful cooperation between the Bern Convention and the European Environment Agency, assuring the necessary close harmonisation (and enhancement) of methodologies and standards for the conservation of nature in a truly pan-European approach.

Good account has also been taken of the scope for synergy with other relevant international nature conservation regimes in which the project countries participate; such as the Ramsar Convention, the World Heritage Convention, the UNESCO Man & the Biosphere Programme and the protected areas programme of IUCN. In the course of undertaking the work, technical collaborations have further been strengthened with (among others) BirdLife International, IUCN, WWF, GEO-BON and the European Habitats Forum, as well as numerous national NGOs and civil society organisations.

The degree of scientific consensus in establishing the Emerald Network shown by all these shared efforts, the resulting inter-operability of data sharing and analysis tools, and the common standards of expectation that this has built for the Network as a whole, together provide a very robust basis for effective conservation policy and management at a continental scale. This aspect is developed further in section 6 below.

2. EIONET is a partnership network of the EEA and its member and cooperating countries including the Agency itself, six European Topic Centres (including the Topic Centre on Biological Diversity) and a network of around 1000 experts from 39 countries in up to 400 national bodies dealing with environmental information.

Republic of Moldova (O. Covaliova)

4. Setting up the framework

This section first summarises the process that was developed for setting up the framework of the Emerald Network, and then presents the results achieved so far in identifying and designating sites. Aspects concerning the protection and management of the sites are then presented in section 5 below.

The process of network establishment

Resolution No. 3 (1996), Recommendation No. 16 (1989) and Resolution No. 5 (1998), each adopted by the Bern Convention Standing Committee, have provided guidance on the process of identifying and designating Areas of Special Conservation Interest (ASCIs) for the Emerald Network in countries other than EU Member States (in the latter it is taken care of by the compatible process for identifying and designating SPAs and SACs for the Natura 2000 network, under the EU Directives on Birds and Habitats). The process consists of three phases (which are pursued iteratively rather than necessarily in a linear sequence).

Phase I

The first step in Phase I is for participating countries to identify species and habitats that require specific conservation measures, in the terms of Recommendation No. 14 of 1989. Lists of these have been compiled by the Standing Committee (habitats in Resolution No. 4 of 1996 and species in Resolution No. 6 of 1998[3]). The lists were revised (species in 2011 and habitats in 2014), mainly to harmonise with changes in the Annexes of the EU Directives resulting from successive EU enlargements, and to align the listed habitats with the EUNIS classification.

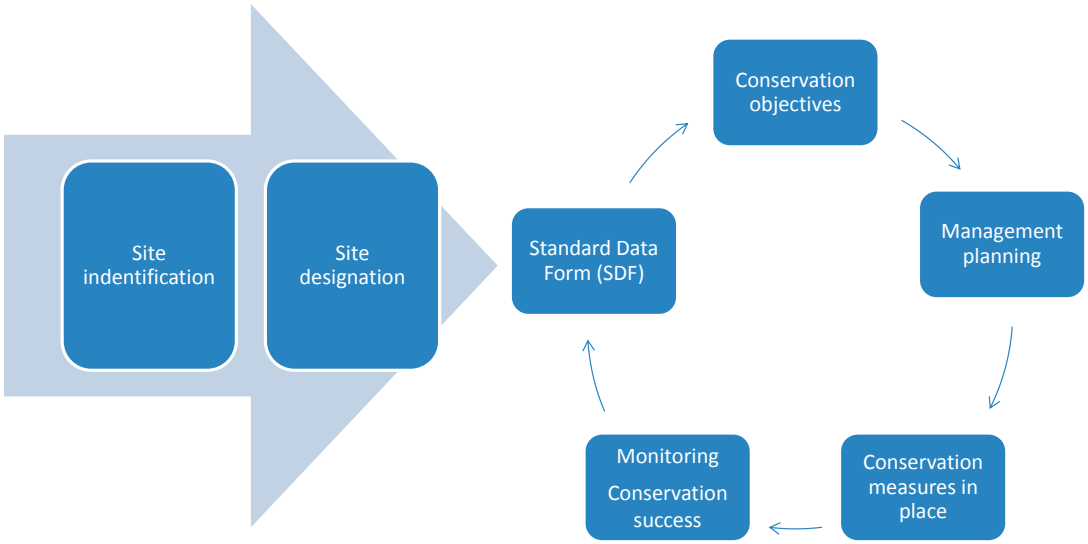
The second step is for countries to select potential ASCIs according to the criteria in Recommendation No. 16. A site will qualify if it:

- contributes substantially to the survival of threatened species, endemic species, or any species listed in Appendix I or II of the Convention; *or*
- supports significant numbers of species in an area of high species diversity or supports important populations of one or more species; *or*
- contains an important and/or representative sample of endangered habitat types; *or*
- contains an outstanding example of a particular habitat type or a mosaic of different habitat types; *or*

3. The habitats list applies universally, whereas the species list indicates some species which do not necessarily require special conservation measures in every country, owing to their relative abundance in certain parts of Europe.

- represents an important area for one or more migratory species; *or*
- otherwise contributes substantially to the achievement of the objectives of the Convention.

Countries then complete standard data forms for each selected site, using the template appended to Resolution No. 5 of 1998 (the version updated in 2013), and they submit these electronically to the Bern Secretariat. Following preliminary verification by the Secretariat of the quality and completeness of the data[4], the sites become officially accepted by the Standing Committee as "candidate Emerald sites".



The Emerald Network process

Phase II

Phase II involves an evaluation of the proposed sites on a biogeographic basis (or a country basis in the case of birds), by means of regional scientific seminars which assess the adequacy of the relevant country site lists, species by species and habitat by habitat, according to guidance adopted by the Standing Committee[5] and the relevant Group of Experts[6]. An adequate list is one deemed sufficient to enable a favourable conservation status for a given species or habitat type in the biogeographical region concerned.

Site lists are assessed in terms of their *quantitative* adequacy and their *qualitative* adequacy. Quantitative adequacy is assessed on the basis of physical parameters such as the number of sites proposed and the geographical area they cover. The most commonly used parameter is the area of network coverage as a percentage of the total geographical area of the country (this can therefore be related to the key element of Target 11 in the Aichi Biodiversity Targets – see section 2 above). This is an easily measurable and understandable form of assessment, but it is not necessarily informative about the functional value of the network.

To address the latter, adequacy in *qualitative* terms is assessed on the basis of additional scientific evaluation of the network's likely functional value. In order to be fully coherent and thus "sufficient" in terms of Emerald objectives, the network must correspond to the ecological needs of each of the features (species and habitats) listed in the relevant Bern Convention decisions and occurring in the country. The measured parameter is usually the number of features (species, habitats) for which the network is judged to be "sufficient", expressed as a proportion of all the listed features that occur in the country concerned.

4 As described in the Appendix to Recommendation No. 157 (2011).

5 Bern Convention (2013). Criteria for assessing the national lists of proposed Areas of Special Conservation Interest (ASCIs) at biogeographical level and procedure for examining and approving Emerald candidate sites. Revised version of initial guidance from 2010, adopted as Document T-PVS/PA (2013) 13 by the 33rd meeting of the Standing Committee, Strasbourg, December 2013.

6 Bern Convention (2015b). Emerald Network sufficiency evaluation (Phase II): methodology, practical organisation and outcomes. Document T-PVS/PA (2015) 2 prepared for the 7th meeting of the Group of Experts on Protected Areas and Ecological Networks, Strasbourg, September 2015.

Georgia

In theory, quantitative performance and qualitative performance should be correlated with each other, but experience with Natura 2000 shows that this is not always the case. A difference can occur for example when a site list has achieved good surface area coverage in a country but has failed to encompass the conservation needs of a particular taxonomic group or a particular habitat type.

Ideally both types of assessment should be synchronised, for example with qualitative assessments dated to a certain year corresponding to database submissions from the end of the previous year (this is the normal approach taken to assessments of data for Natura 2000 sites). This has however not always been possible in the case of the Emerald sites, since resource constraints have sometimes delayed data submission until after the sufficiency assessment that should have included it. For example the quantitative assessment of habitats and non-avian species for the South Caucasus countries has been able to make use of databases submitted at the beginning of 2017, whereas the qualitative assessment is based on databases submitted at the beginning of 2015. This would tend to mean that in such cases the overall assessment may under-reflect the true sufficiency of the network concerned.

In all other respects the qualitative assessment of proposed Emerald Network sites follows the same process as that designed for Natura 2000 sites in the EU[7]. The assessment is often referred to as the "biogeographic assessment", reflecting the fact that the unit of sufficiency evaluation is the country and the biogeographic region[8], for all habitats and species (country only in the case of birds). The process is iterative, beginning with submission of databases by country authorities using a Standard Data Form (SDF) for each site, accompanied by the proposed site boundaries in GIS format.

Species-by-species and habitat-by-habitat scientific evaluations are then undertaken by independent experts, who compare the data with the most comprehensive and recent information available on distribution ranges and patterns, population sizes and habitat extent, from published reports, on-line databases and other valid sources. These analyses aim to decide whether the list of proposals for a given country:

- represents sites from the entire distribution range of every Emerald species and habitat at the national level (and at the biogeographical level if the country concerned straddles more than one region);
- reflects the ecological variation of the habitat and the genetic variation of the species within the biogeographic region concerned; and (for species) includes the full range of habitats required over the different stages of its life-cycle;
- is well adapted to specific conservation needs, in particular to those related to distribution patterns and to the threats and pressures affecting the species and habitats concerned;
- includes significant proportions of the total national area of the habitats and populations of the species concerned.

These evaluations produce a "draft conclusions" document which is then further discussed in "biogeographic seminars", with representatives of country authorities, the Bern Convention Secretariat, NGOs, independent scientific experts and others. For each country in the region concerned (as well as for the region as a whole), and for each of the relevant species and habitats on the lists in the two Bern Convention Resolutions (No. 4 of 1996 and No. 6 of 1998), the seminar assigns one of the following final conclusions:

- *Sufficient* (no further sites necessary);
- *Insufficient minor* (no further sites necessary, but species/habitat should be recorded in the database for one or more sites where it is known to occur but currently records are missing);

7 Described in more detail in Council of Europe (2013, op. cit.); and for Natura 2000 in Evans, D (2012). Building the European Union's Natura 2000 network. *Nature Conservation* 1: 11–26.

8. For a list and a description of the biogeographical regions, see http://bd.eionet.europa.eu/activities/Natura_2000/chapter1 .

- *Insufficient moderate* (new sites or enlargements of existing sites are necessary);
- *Insufficient major* (as above but for cases where there are currently no sites for the species/habitat in the country/biogeographical region);
- *Scientific reservation* (not possible to reach a reasoned conclusion because of a lack of information - further surveys or information checking is necessary);
- *Correction of data* (there is a need to correct errors, or to complete the minimum required information in the SDF/s).

A further seminar output is the post-evaluation official Reference Lists of species and habitats present in each biogeographic region, which are used as the basis for site selection proposals.

The final conclusions document then becomes an action agenda for the national authorities, and following further work and submission of updated databases (usually after one or more years) the evaluation process iterates again, with the aim ultimately of being able to conclude that all countries have attained 100% sufficiency. Once a country's list emerges from this process it is subject to final scrutiny and approval by the Group of Experts before being transmitted to the Standing Committee for formal adoption as part of the Emerald Network.

Phase III

Phase III consists of the national designation of the adopted Emerald Network sites (ASCIs) and the implementation of management, monitoring and reporting measures (see section 5 below) in line with Bern Resolution No. 8 of 2012.

Results

Identification and evaluation of sites

All the countries made significant progress in terms of assembling and coordinating networks of national experts, knowledge transfer and skills development concerning the ecological, data-handling and administrative aspects of the Emerald Network.

During the first Joint Programme it was notable that with the exception of Azerbaijan (where there was one change of project team leader early in 2011), all the national Emerald teams maintained the same composition of personnel throughout, ensuring a continuity of engagement (and a build-up of sustained levels of trust in working relationships) which is particularly valuable in a process as complex as the Emerald process.

The project made a major contribution to improving national and regional knowledge and data on the distribution and status of habitats and species in the countries concerned. The benefits of this extend beyond the specific objectives of establishing the Emerald Network: it has also equipped the countries with the information required for implementing appropriate environmental policy objectives in a more general sense.

The scale of data acquisition and compilation achieved by the project is shown in Table 1. Available habitat records increased from 850 to 10,071 and species records from 6,965 to 37,613, covering a final 2,213 sites. Table 2 shows the 2016 totals broken down for the individual countries.

Table 1: Increase in data records for each project delivery year from 2009-2016

Category	2009	2010	2011	2014	2015	2016
Plants	185	298	1,379	1,716	2,165	2,470
Invertebrates	357	670	1,254	1,928	2,423	2,843
Fish	348	603	1,174	1,330	1,566	1,932
Amphibians/Reptiles	250	370	795	915	1,108	1,216
Birds	5,234	8,770	16,450	28,171	23,068	25,701
Mammals	591	851	1,714	2,501	3,150	3,451
Habitats	850	1,224	3,849	4,990	8,054	10,071
Sites	143	249	959	1,588	2,019	2,213
TOTAL	**7,958**	**13,035**	**27,574**	**43,139**	**43,553**	**49,897**

Table 2: Number of data records per country as at 2016

Category	Armenia	Azerbaijan	Belarus	Georgia	Republic of Moldova	Russian Federation	Ukraine	Total 2016
Plants	39	19	165	104	42	1,483	618	**2,470**
Invertebrates	30	38	209	304	90	677	1,495	**2,843**
Fish	33	51	254	33	125	443	993	**1,932**
Amphibians/Reptiles	21	50	92	121	87	354	505	**1,216**
Birds	901	936	2,493	1,011	502	8,534	11,312	**25,701**
Mammals	180	100	334	679	70	1,308	780	**3,451**
Habitats	528	47	1,803	207	223	3,817	3,446	**10,071**
Sites	23	17	162	55	52	1,633	271	**2,213**

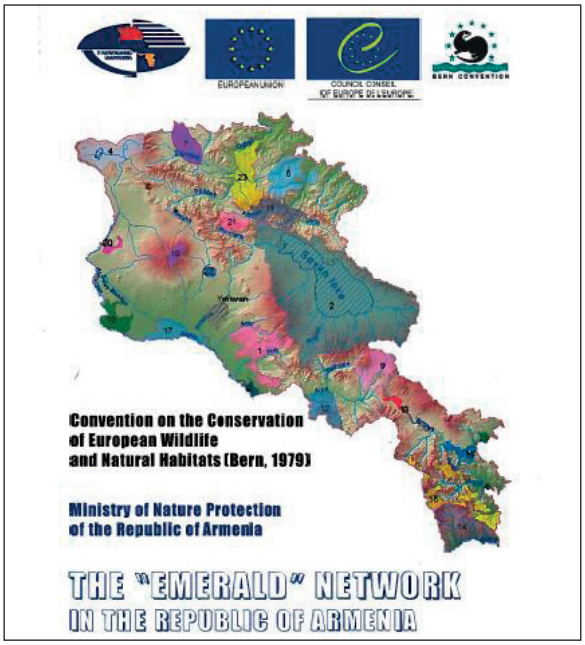
Birds are the group for which the greatest volume of data has been recorded. The significant increase in the number of bird records between 2011 and 2014 is mainly due to a change in the structure of the database in terms of the way that population sizes are recorded (e.g. distinguishing breeding and wintering populations separately, whereas prior to 2012 they were combined).

In many cases there was a need for primary field survey work as well as research on documented information and experts' knowledge. This formed an important part of the programmes' efforts, although such work is resource intensive and (seasonally) time-sensitive and was therefore limited by the time and resources available.

Detailed quality checks were carried out on the individual country databases by the project's scientific and technical expert. These were checks on the quality of the data themselves – the scientific quality of the *site proposals* is a separate matter, which is addressed separately below.

For both the Republic of Moldova and Azerbaijan, the need for further assistance in the correction of some Emerald site data gaps and inconsistencies was addressed through two extra activities which took place early in 2012 during the extension of the first project eligibility period.

Although not strictly a project objective, significant advances were made during the course of the programmes in identifying species and habitats that are recognised to be conservation priorities in the target countries but which were not at the time included in the Bern Convention's Resolutions or in the Annexes of the EU Directives. During the first Joint Programme for example, some 700 species were found to be in this category. This work provides a helpful foundation for adapting the relevant lists in due course (see section 7 below).



All countries also produced an updated list of designation codes describing the legally-backed protection systems in place at the national level for protected areas.

From an early stage it was clear that if site selection was to be based only on existing networks of protected areas, the resulting coverage would be insufficient to meet the requirements of the Emerald Network. While on the one hand a number of the countries had some larger and more unmodified protected areas than those typically seen in highly fragmented European Union countries, at the same time there was perhaps poorer coverage of areas in various forms of productive economic uses but which nevertheless have high ecological importance.

This led to some intensive consultation and negotiation processes between environment Ministries and other sectoral Ministries to establish a shared view about the need to include such areas in the Network, and the implications of doing so. Inter-ministerial meetings were organised at national level with the support of the national Emerald teams to address this, particularly in Armenia, Belarus, Georgia, the Republic of Moldova and Ukraine, with Georgia extending the process to a range of other stakeholder groups and linking it with general awareness-raising activities on the benefits of Emerald designation.

Cross-sectoral engagement of relevant national authorities in Azerbaijan and the Russian Federation was at a lower level, partly at least as a result of the limited capacity of authorities responsible for nature conservation to mobilise such processes. Nonetheless the national Emerald teams in these countries were strong in scientific expertise, thanks among other things to committed engagement by the NGO representatives.

The first Joint Programme (2009-2012) resulted in the identification of 959 potential Emerald sites with a total area of over 357,000 km^2. The second Joint Programme (2013-2016) resulted in the identification of further sites, with a steady progression in increasing numbers and area coverage throughout the period, as illustrated by Table 3. An important part of this increase involves the addition of smaller sites, sites distributed with a view to good ecological connectivity in the landscape (e.g. as "stepping stones"), and sites going beyond pre-existing national protected area networks (progress on the latter having been particularly apparent in the case of Belarus, Georgia and the Republic of Moldova). This is a reflection of the aims of the Emerald Network to achieve better geographical and ecological representativity and coherence in the identification of sites.

Table 3: Progressive increase in identification of potential Emerald sites, 2012-2015

Country	2012			2014			2015		
	Sites	Area (km^2)	% of country area	Sites	Area (km^2)	% of country area	Sites	Area (km^2)	% of country area
Armenia	9	2,288	7.7	13	2,963	9.9	21	4,975	16.6
Azerbaijan	10	9,970	11.5	12	8,455	9.7	16	8,699	10.0
Belarus	12	9,122	4.4	16	9,806	4.7	119	21,350	10.3
Georgia	20	5,868	8.4	21	9,199	13.2	49	10,436	15.0
Republic of Moldova	17	4,142	12.2	18	3,885	11.5	36	3,128	9.3
Russian Federation	740	282,690	7.1	923	311,636	8.0	1,548	492,511	10.0
Ukraine	151	43,290	7.2	159	44,695	7.4	194	53,613	8.9
Total	**959**	**357,372**	**Average 8.4%**	**1,154**	**390,407**	**Average 9.2%**	**2,019**	**594,711**	**Average 11%**

Note: Although the total area figures for the Republic of Moldova and Azerbaijan appear to decrease over time, this is connected with site boundary re-definitions, and the correct final figures are those shown in Table 4.

Ukraine (E. Karpova)

Following all necessary final data adjustments, the results as at February 2017 are shown in Table 4. One of the adjustments that has been made is to re-calculate the surface area figures using GIS boundary data, so these figures will not necessarily exactly match those recorded in the individual Site Data Forms. Area figures have been rounded.

Table 4: Final totals of identified sites

Country	Number of sites	Total area of sites (km^2)	% of country area
Armenia	23	10,829	**36.5**
Azerbaijan	17	16,780	**19.4**
Belarus	162	24,197	**11.7**
Georgia	55	11,011	**15.8**
Republic of Moldova	52	2,703	**7.9**
Russian Federation	1,633	496,255	**12.6**
Ukraine	271	62,487	**10.4**
Total	**2,214**	**624,262**	**Average: 12.6***

**Note:* This overall average figure is not the arithmetical mean of the country percentages in the column above the figure (which would be 16.3%). Instead it has been calculated as the total network area expressed as a percentage of the total combined area of the seven countries (with that for the Russian Federation interpreted as described in page 16).

An indication of the scale of expanding coverage of identified sites over the programme period is given in Figures 1 and 2 below.

Figure 1: Sites identified for the Emerald Network as at 2009 (all Emerald countries)

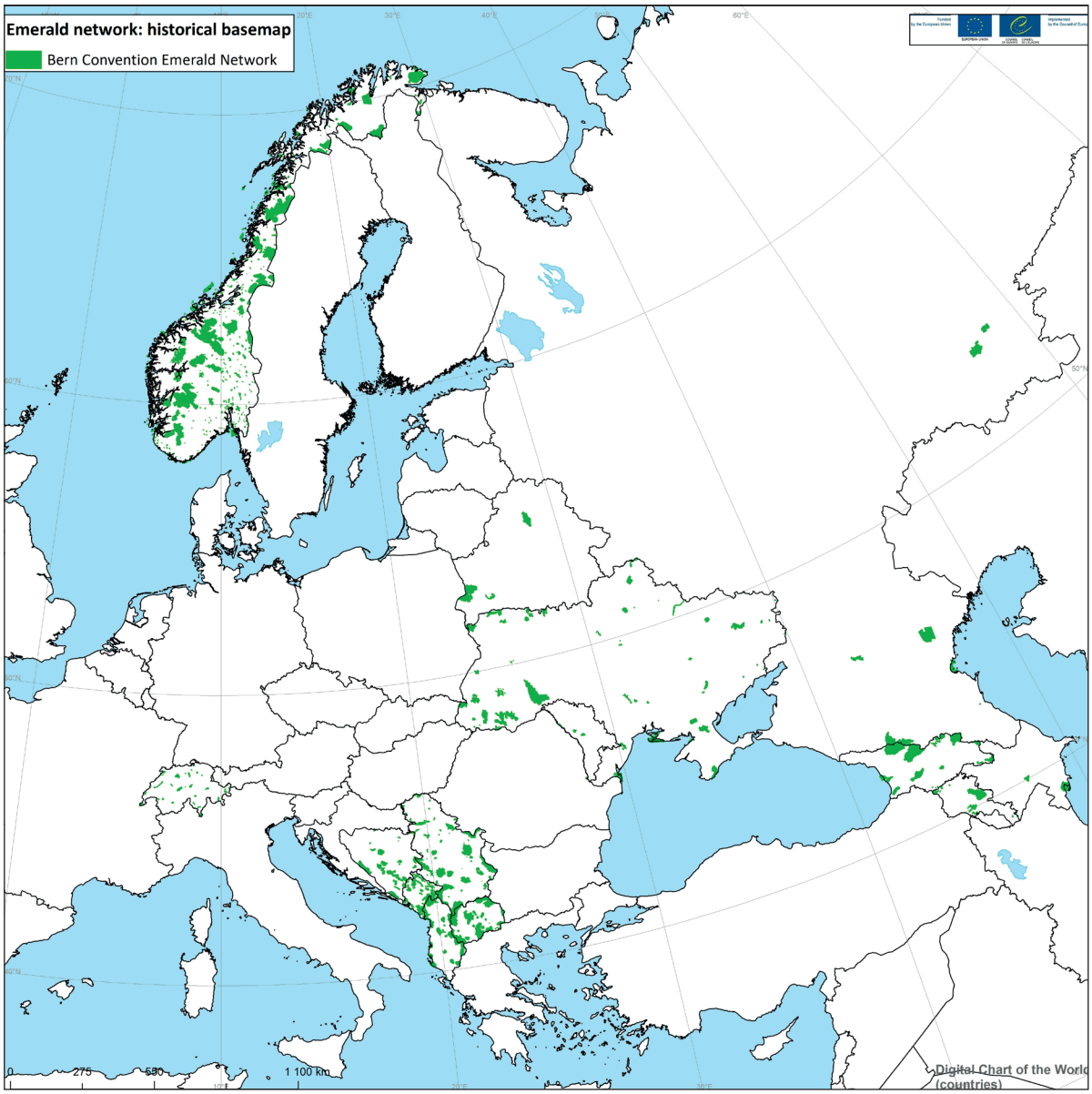
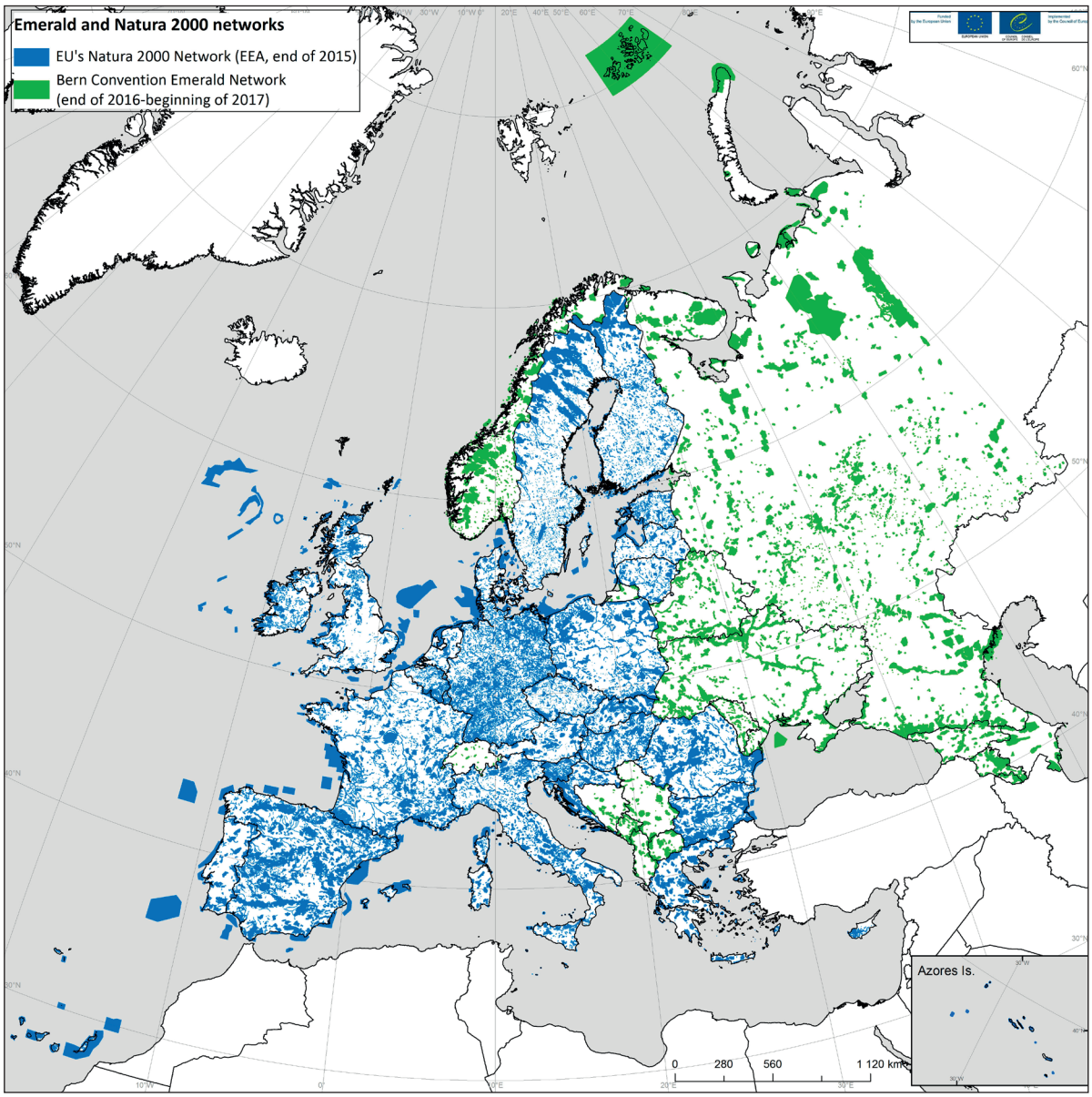


Figure 2: Sites identified for the Emerald Network as at the end of 2016 (all Emerald countries). (The blue areas represent Natura 2000 sites in the EU countries, for comparison as discussed further below)



All but one of the countries have proposed sites covering more than 10% of their national (non-marine) territory. The Armenian total of 36.5% is notable not only because of its absolute magnitude but also because the work on the Network in Armenia began much later than in the other countries. In terms of the Aichi Biodiversity Target referred to in section 2 above, if the sites they have each identified become subject to adequate conservation by 2020 as described in the target, Armenia and Azerbaijan will have exceeded the target and Georgia will have come close to it, with most of the others not far behind[9].

The figures above of course are purely quantitative measures. Qualitative sufficiency is a separate question, addressed through the biogeographic evaluation process which began in 2015, and the methods for which are described in section 4 above. The sufficiency conclusions which emerge from this iterative evaluation process cover both quantitative sufficiency (area and number of sites, producing a conclusion about what has been done) and qualitative sufficiency (representation of species and habitats, and functional aspects, producing a conclusion about the distance to the "favourable conservation status" target).

Six biogeographic seminars took place in 2015-16, as follows:

- For all habitats and species except birds in Armenia, Azerbaijan and Georgia.
- For all habitats and species except birds for the Arctic biogeographic region in the Russian Federation, the Boreal biogeographic region in Belarus and the Russian Federation, and the Alpine-Urals region in the Russian Federation.
- For bird species in Belarus, the Republic of Moldova, the Russian Federation and Ukraine.
- For all habitats and species except birds for the Continental biogeographic region (Belarus, the Republic of Moldova, the Russian Federation and Ukraine); and the Pannonian and Alpine Carpathian regions (both Ukraine).
- For all habitats and species except birds for the Steppic region (the Republic of Moldova, the Russian Federation and Ukraine), the Alpine Caucasus region (the Russian Federation), and the Black Sea region (the Russian Federation).
- For bird species in Armenia, Azerbaijan and Georgia.

The quantitative part of the sufficiency evaluation involves addressing the site number and area information in its (biogeographic) regional context. As Table 5 below shows, there are some considerable differences between the figures for each region. A relatively high percentage coverage of represented biogeographic region portions by Emerald sites is seen in the Russian part of the Black Sea region, the Armenian part of the Alpine-Caucasus region and the Azerbaijan part of the Anatolian region, while relatively low coverage is seen in the Russian part of the Continental region, the Ukrainian part of the Pannonian region and the Moldovan part of the Steppic region.

Table 5: Area coverage of Emerald sites per biogeographic region in each country

Country	Biogeographic region	% of the country's area in the biogeographic region	Number of Emerald sites	Area of Emerald sites (km²)	Area of sites as a % of the area of the biogeographic region in the country
Armenia	Alpine-Caucasus	63	18	10,161	54
Armenia	Anatolian	37	13	1,865	17
Azerbaijan	Alpine-Caucasus	32	4	5,207	19
Azerbaijan	Anatolian	6	2	2,471	46
Azerbaijan	Steppic	61	12	9,057	17
Belarus	Boreal	43	86	8,571	10
Belarus	Continental	57	80	15,625	13
Georgia	Alpine-Caucasus	63	38	7,828	18

9. For a global overview of the current position on this, see Convention on Biological Diversity (2016). Protected areas: facilitating the achievement of Aichi biodiversity target 11. Document UNEP/CBD/COP/13/INF/17 prepared for the 13th meeting of the Conference of the Parties, Cancun, Mexico, December 2016.

Georgia

Country	Biogeographic region	% of the country's area in the biogeographic region	Number of Emerald sites	Area of Emerald sites (km²)	Area of sites as a % of the area of the biogeographic region in the country
Georgia	Black Sea	28	23	2,558	13
Georgia	Steppic	9	4	824	13
Republic of Moldova	Continental	61	39	1,776	8
Republic of Moldova	Steppic	39	15	929	7
Russian Federation	Alpine-Caucasus	2	47	19,371	29
Russian Federation	Alpine-Urals	3	21	32,365	28
Russian Federation	Arctic	10	45	178,581	46
Russian Federation	Black Sea	0.1	4	2,476	75
Russian Federation	Boreal	47	534	163,836	9
Russian Federation	Continental	18	681	33,518	5
Russian Federation	Steppic	20	366	61,449	8
Ukraine	Alpine-Carpathian	4	25	5,690	22
Ukraine	Continental	54	143	31,884	10
Ukraine	Pannonian	0.5	6	160	6
Ukraine	Steppic	41	107	20,802	8

Note: All area statistics here have been calculated using GIS boundary data. The totals of the numbers of sites for each country in Table 5 do not always match the totals for those countries in Table 4, because some sites straddle biogeographic regional boundaries, and where this is the case they are counted more than once in Table 5.

Clearly, the smaller the extent of a region, the easier it is to achieve a higher percentage figure for that region. Conversely, the larger the region, but *also* the larger the *country*, the harder it is to achieve high scores for sufficiency in the evaluation process. This can apply in the case of the qualitative assessments too, since in countries with vaster national territories (notably Belarus and the Russian Federation) there is objectively more for them to do in order to reach the same sufficiency target.

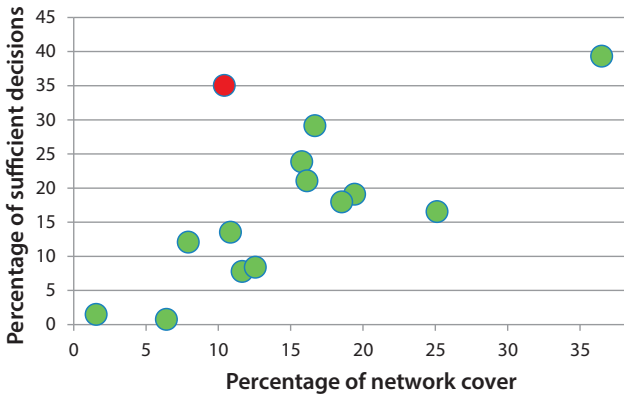
This is borne out by some of the sufficiency conclusions of the biogeographic seminars, with higher scores in some cases for the Caucasian countries (Armenia, Azerbaijan and Georgia) compared with the others, although not all the results follow this trend, and Ukraine in particular scores higher than would be expected on this basis (see Table 6 below). Overall however, the conclusions indicate that the species and habitats requiring priority conservation attention in the target countries have been quite successfully encompassed within the sites proposed for the Emerald Network.

Table 6: Summary of conclusions regarding network sufficiency, from the quantitative and qualitative evaluations conducted through the biogeographic seminar process. The figures indicate the percentage of the species and habitats concerned in each case for which sufficiency was rated as "sufficient" (= the highest rating on the six-point scale described in section 4 above)

Country	Habitats	Plants	Non-avian animals	Birds
Armenia	22.2	35.7	21.1	59.3
Azerbaijan	3.8	20.8	35.4	18.1
Belarus	0.0	8.8	6.1	19.4
Georgia	6.3	32.1	37.5	21.4
Republic of Moldova	3.8	0.0	15.2	16.3
Russian Federation	6.2	11.4	11.2	3.6
Ukraine	36.6	34.4	33.6	35.7
Average	**13.5**	**18.8**	**21.8**	**24.6**

As mentioned earlier in the present section above, it would normally be expected that quantitative performance and qualitative performance would be correlated with each other. For countries covered by the joint programmes this has indeed been found to be the case, as shown in Figure 3 below. The finding is furthermore statistically significant ($r = 0.68$; $P<0.001$), with only one country representing a significant deviation from the pattern, namely Ukraine (low quantitative coverage but high qualitative sufficiency).

Figure 3: Relationship between quantitative (coverage) and qualitative (sufficiency) assessment results for the Emerald Network countries. The red point shows Ukraine as the exception to a general pattern of significant correlation between the two types of assessment



Other results

The processes of identification and evaluation of sites produced a range of other benefits in addition to the site lists and sufficiency conclusions described above. Many of the individuals and groups who participated were new to the context and to the methods of working, and they rapidly gained greater confidence and capabilities than they had before. Particular progress was made in consolidating a shared understanding of dynamic and coherent site network concepts, thus moving on from an approach that had been prevalent in some places in the past whereby individual protected areas had been conceived and administered in isolation, with few if any ecological management objectives being defined.

The breadth and depth of stakeholder engagement was a significant achievement of the joint programmes. This enriched the results of the programmes themselves, but also represented a benefit to those involved, who otherwise would not have had the same opportunity to develop the skills, experience and collaborative connections that will now make them effective contributors to many other conservation initiatives for a long time to come. The biogeographic seminars brought together a total of 250 participants across the countries,

and around 150 of these participants took part in more than one seminar. Many other national and local experts and volunteers were involved in the field surveys and data analysis.

Particularly notable is the strong input received from the NGO sector, in some cases matching that typically seen in the EU, despite the fact that many eastern countries have a much more limited history of this kind of cooperation (see comments on this also in sections 5 and 6 below).

Mutual learning and experience-exchange was a strong feature, including between countries, through the process of the seminars. Challenges faced in common by all the countries (e.g. selection of the best sites, effective governmental negotiations, impactful public relations, organising time-sensitive field research, working with the Emerald software, framing appropriate site management regimes) were addressed collectively, with those having more experience passing it on to those with less. Within countries too, a cascade of capacity-building impacts was evident, for example with countries such as Armenia, the Russian Federation and Ukraine applying the Emerald evaluation methodology in their own self-organised evaluations at national level.

Awareness activities were undertaken in various ways by the countries during the programme to raise the profile of the Emerald Network and to promote understanding of its aims. Some examples of these include:

- Publication of a book detailing the Emerald Network sites in Armenia, and the species and habitats represented. The book is illustrated with photographs and a map of the sites, and the text is presented in both Armenian and English. It is designed to appeal both to stakeholders/decision-makers and to the general public.
- Extensive media coverage of a national Emerald workshop in Belarus.
- A bus that travelled through the Republic of Moldova, providing information to schools, local authorities and NGOs at local level.
- An event organised with biology students in the Republic of Moldova, exploring ways of engaging them in monitoring the species and habitats to be protected within the Emerald Network.
- Publication of a book on the Emerald Network in the Russian Federation, and a brochure in the Russian language with a print run of 1,500, describing the processes of habitat identification and sufficiency evaluation. There was a particular communication and capacity building challenge in the Russian Federation, given the devolution of relevant responsibilities for nature conservation to more than 50 regional authorities (oblasts) in the European part of the country and the need to engage them all. At a national conference on setting up the Emerald Network held in 2014, only 16 of these 50 authorities were represented, so the publications were part of an effort to reach out in different ways to the administrations concerned.
- Publication of a book on the Emerald Network in Ukraine.
- Production of an awareness-raising video in Ukraine, documenting the involvement of schoolchildren in species and habitat inventory work at one of the proposed Emerald sites in the country. This initiative highlighted the importance of links between conservation and education, and established a working link between the national Emerald team and the Ukrainian Union of Teachers.

Designation of sites

As described in section 4 above, once identified sites have been recorded on data forms and the quality and completeness of the data has been confirmed by the Bern Convention Secretariat, such sites may be accepted by the Standing Committee as "nominated" or "candidate" Emerald Network sites. Once a candidate site has been through the sufficiency evaluation process it passes again to the Standing Committee, and the Committee may then adopt it as an "adopted" Emerald site. It is then for the relevant national government to designate it as a "designated" Emerald site (and to apply the prescribed conservation measures).

The first "adoption" decision was confirmed in 2012, in respect of 37 candidate sites put forward by Switzerland. Only two other countries have so far proceeded to this stage (and on to the national designation stage), and both are countries covered by the programme reported here; namely Belarus (155 sites) and Ukraine (271 sites). This is testament to the progress brought about by the two joint programmes, marking an impressive start when considered in relation to other non-EU countries (including for example Iceland and Norway) which have so far not yet advanced to the same degree. That said, of course there remain five other countries participating in the joint programmes where this stage has not yet been reached.

Belarus

Comparison with the status of the Natura 2000 Network in the EU

The remainder of this section provides an analysis of the progress achieved so far with the establishment of the Emerald Network in non-EU countries (including the seven countries covered by the two joint programmes reported above) in comparison with the progress achieved so far with the establishment of the Natura 2000 Network under the Nature Directives in the countries of the EU. (Some of these latter countries of course joined the Union later than others, so they did not all begin their work on this issue at the same time, and for the purposes of the present analysis they cannot be regarded as a homogeneous group in this sense).

Natura 2000 is seen as the mechanism for implementation of the Emerald Network in the European Union Member States. Assessments of network adequacy for Natura 2000 began about 15 years earlier than the equivalent process for Emerald sites in non-EU countries, with the first EU biogeographic seminar (for the Macaronesian region) taking place in 1996[10], while the first equivalent Emerald seminar (for East Balkan countries) was not held until 2011.

Natura 2000 is one of the largest site networks in the world. The European Commission, after extensive analyses of the performance of the Nature Directives, confirmed in 2016 that they are fit for purpose and that the Natura 2000 network is one of the greatest achievements they have brought about.

The Natura 2000 example could therefore be seen as some kind of benchmark for what might realistically be achieved by the Emerald Network in due course. Moreover, since the site selection criteria and the network constitution process have been designed to be the same in both networks, each of them should be amenable to analysis of performance by means of exactly the same indicators as the other.

Further still, it is well accepted that conceptual and functional coherence between the Emerald and Natura 2000 networks is essential for ensuring an integrated pan-European network of areas, which serves strategic aims for nature conservation at an ecological level as well as contributing to overcoming the barriers that history, politics and economics impose as challenges in the environmental sphere more generally. (See Figure 2 above for a pan-European view of this in map form).

Comparisons are given below of various performance indicators (e.g. coverage, sufficiency) that are similar between the Emerald Network process and Natura 2000. Some caution should be exercised in interpreting these however, given that the two processes began at different times and did not progress in synchrony. The Natura 2000 experience was complex and sometimes contentious, and its results are based on several decades of intensive research and negotiation – Emerald is unlikely to be any different in this respect, and its results may similarly take some appreciable time to reach full realisation. Expectations therefore cannot yet be at the same level as they are for Natura 2000, given the difference of some 15 years between starting times of the two processes.

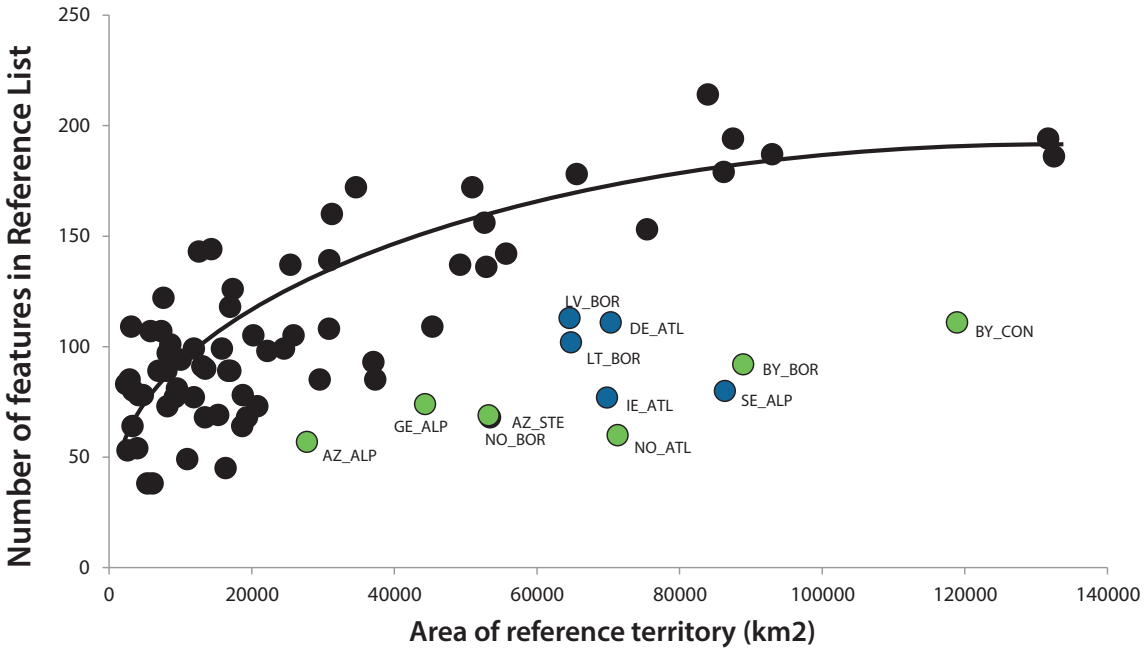
At the same time it must be acknowledged that the results that are already apparent testify to an extremely committed and rapid uptake of the concepts, objectives and processes associated with network establishment in the Emerald countries, comparing very favourably to the record over a much longer period in the Natura 2000 countries.

10. European Topic Centre on Biological Diversity (ETC/BD) (2017). Biogeographical seminars. In: Evans, D (2012). Building the European Union's Natura 2000 network. Nature Conservation 1:11–26.

One basis for the comparison is the status and distribution of relevant nature conservation interests and the state of knowledge about these. Identification of Emerald sites is based on the presence of habitats listed in Bern Convention Resolution No. 4 or species listed in Resolution No. 6, as described in earlier sections of the present report above. These include in total just over 200 habitats and 1,000 species (or taxonomic units). The Reference Lists, which are compiled at the time of the first sufficiency evaluation and are then further updated, indicate which Bern Resolution features occur in which country for each biogeographic region. These Reference Lists can only be as complete as prevailing scientific knowledge about habitat and species distributions and occurrences in the relevant areas allows.

There is a relationship between the number of relevant habitats and species occurring in a country and the size of the country, although this is not a linear correlation since the effect tapers off with increasing country size, as shown in Figure 4 below. There is also variation along north-south and east-west gradients, which is to be expected: in the case of the north-south gradient because habitat and species richness would be expected to be greater in the south, and in the case of the east-west gradient because the listing of features in the Resolutions had its origins in the conservation priorities of western Europe and it may therefore match less well to eastern situations. The latter variation however may also be influenced by poorer scientific knowledge about actual feature occurrences in the east.

Figure 4: Hypothetical (black line) and actual (dots) relationship between country/biogeographic region size and the number of Bern Resolution features in the Reference Lists. For those examples showing markedly fewer Reference List features than their size would suggest, blue = Natura 2000 countries; green = Emerald countries. (Extremes, i.e. countries/biogeographical regions larger than 150,000 km², are excluded)



The results show that indeed the lowest area/number of features ratio occurs mainly in northern Europe (principally the Boreal and Atlantic regions, Scandinavia, the Baltic states and neighbouring Belarus), which probably corresponds with the true situation on ground. In this respect the Emerald countries do not differ much from the Natura 2000 countries. The main exceptions are the Alpine-Caucasus region in Azerbaijan and Georgia and the Steppic region in Azerbaijan, which are probably explained by the fact that some of the extreme south-eastern habitat types and endemic species occurring there are not yet included in the Bern Resolutions.

The number of relevant habitat and species records per selected site is another parameter that can be compared, shedding light at least to some extent (compounded of course by biogeographic differences) on the relative completeness of data recording that has been achieved in the different countries. Figures 5-8 below show examples of this, with frequencies per site converted into standardised frequencies per 100km^2 of site area. (Switzerland is not included in these figures, as it is an extreme case of an incomplete list of sites).

Figure 5: Numbers of Bern-listed habitat records per 100 km^2 of network site area for Emerald countries (green) and Natura 2000 countries (blue).

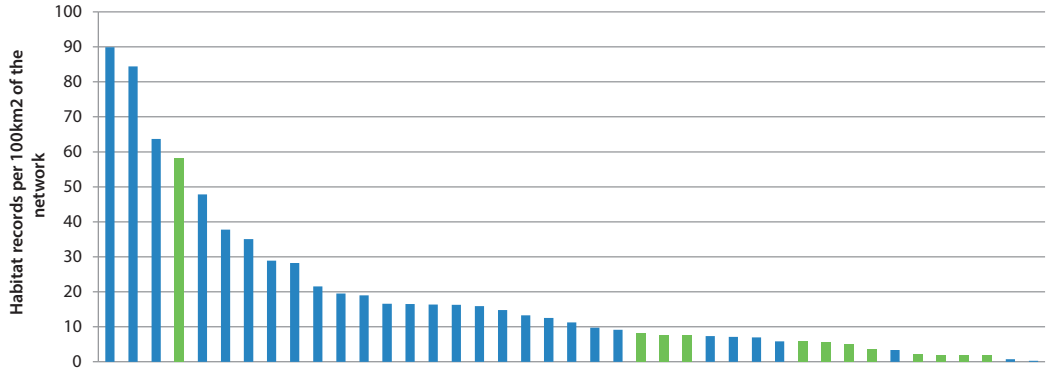


Figure 6: Numbers of Bern-listed habitat records per 100 km2 of network site area for Emerald countries (green) compared with the average for Natura 2000 (blue).

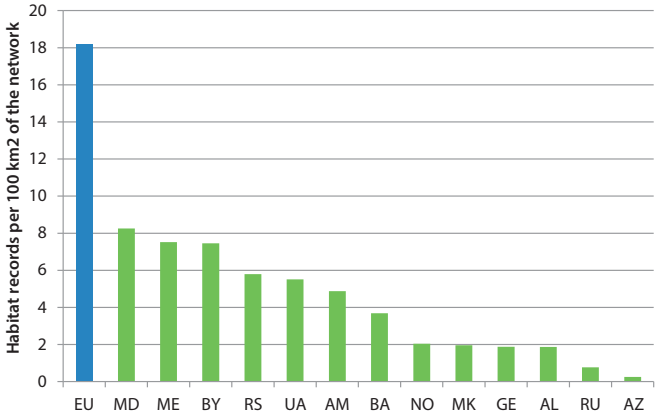


Figure 7: Numbers of Bern-listed invertebrate records per 100 km2 of network site area for Emerald countries (green) and Natura 2000 countries (blue).

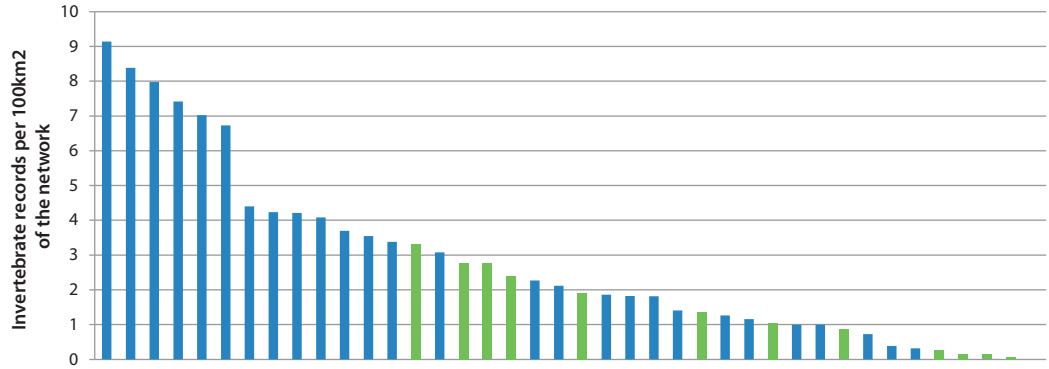
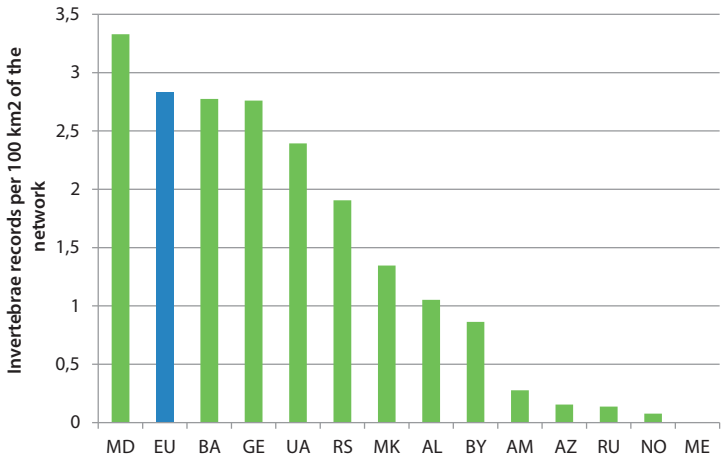


Figure 8: Numbers of Bern-listed invertebrate records per 100 km2 of network site area for Emerald countries (green) compared with the average for Natura 2000 (blue)



The clear pattern here is for Emerald countries to be some way behind Natura 2000 countries, at least as far as habitat and invertebrate recording is concerned. In the case of habitats this may be related to the fact that focusing on habitat type as a unit of attention is a more recently developed conservation approach in most eastern European countries. The development of habitat-related field interpretation skills in these countries also has a shorter history than it does in the EU.

Despite this, for the Bern-listed features in general, there are examples of Emerald sites where high levels of richness have been recorded. A total of 293 sites host more than 50 of the species listed in Resolution No. 6 and 10 sites host more than 100; while 120 sites contain more than 20 of the habitat types listed in Resolution No. 4. At the opposite extreme, 458 sites (nearly a quarter of the total) host only five or fewer of the features (habitats and species combined) listed in the Resolutions.

As suggested already above, one issue here relates to the composition of the species and habitat lists in the two Bern Convention Resolutions. These had their origins in mainly western European perspectives: they include a number of features which mainly or only occur in the west, and conversely they omit some others that only occur in the east.

Investigations into the extent of this include an analysis in 2015-16 of the Red Data lists which each territory (autonomous republic or oblast) in the Russian Federation is required to produce. A total of 56 animal species listed in Bern Resolution No. 6 (which contains 344 species overall) were also Red Listed for at least one oblast in the parts of the country covered by the Continental biogeographic region; and 63 animal species in the Resolution were Red Listed for at least one oblast in the parts of the country covered by the Steppic and Alpine-Caucasus region. Other species in the Resolution occur in the relevant oblasts but are not Red Listed there because they are common in the Russian Federation (e.g. wolf *Canis lupus*, beaver *Castor fiber* and brown bear *Ursus arctos*.

Documenting the east-west imbalances of habitat and species representation in the two Bern Resolutions has been an important outcome of the two Joint Programmes, and it provides a basis for considering future amendments to the respective lists, so that they may become a more complete reflection of priorities in a pan-European sense (see sections 7 and 8 below).

Turning to the quantitative results of site identification, the network coverage achieved, expressed as a percentage of the total area of each country (and given above for the joint programme countries in the right-hand column of Table 4) is shown in Figures 9 and 10 below for all 14 Emerald countries in comparison with the 28 Natura 2000 countries.

Figure 9: Area of identified sites as a percentage of country area (= network coverage) for Emerald countries (green) and Natura 2000 countries (blue)

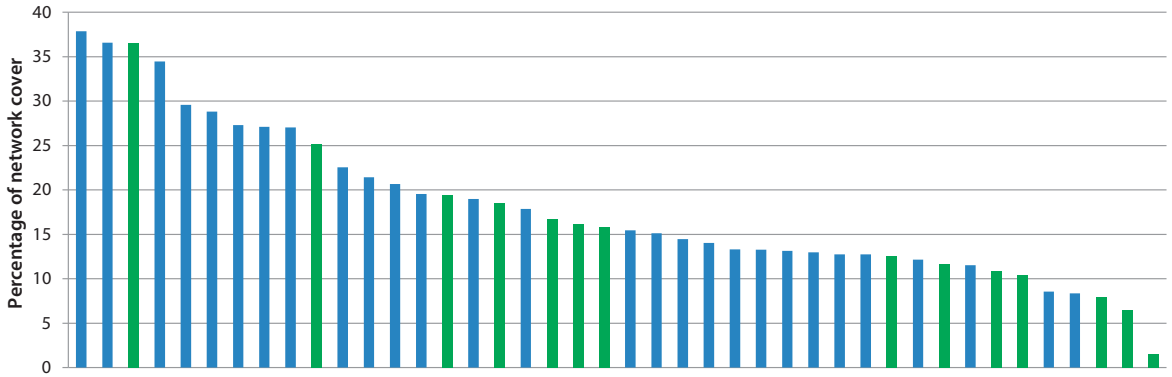
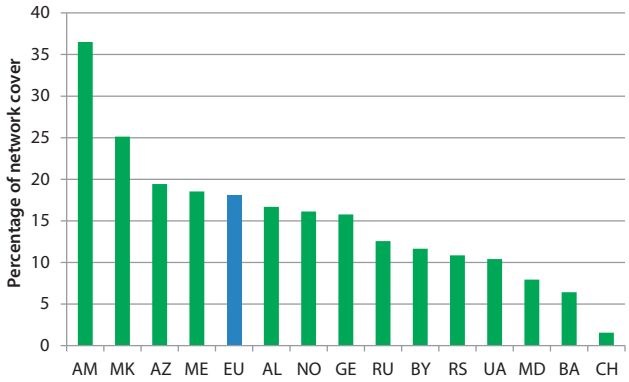


Figure 10: Area of identified sites as a percentage of country area (= network coverage) for Emerald countries (green) compared with the average for Natura 2000 (blue)



While there is quite a span of variation in these quantitative network coverage figures, most of the Emerald countries have achieved results that are comparable to those in the EU, with some going considerably further. The average percentage cover achieved by all Emerald countries is 12.7% while the average for all EU countries is 18.1%; and the difference between the two is not statistically significant. As mentioned earlier in the present section above, this represents a good contribution towards achieving Target 11 of the Aichi Biodiversity Targets (although the target of course entails not just the requisite designation coverage but also adequate conservation measures being in place).

The picture concerning *qualitative* sufficiency is somewhat different, with in this case a marked contrast being evident between the Emerald countries and the much higher-scoring Natura 2000 countries, as shown in Figures 11 and 12 below.

Figure 11: Percentages of positive conclusions regarding qualitative network sufficiency for Emerald countries (green) and Natura 2000 countries (blue).

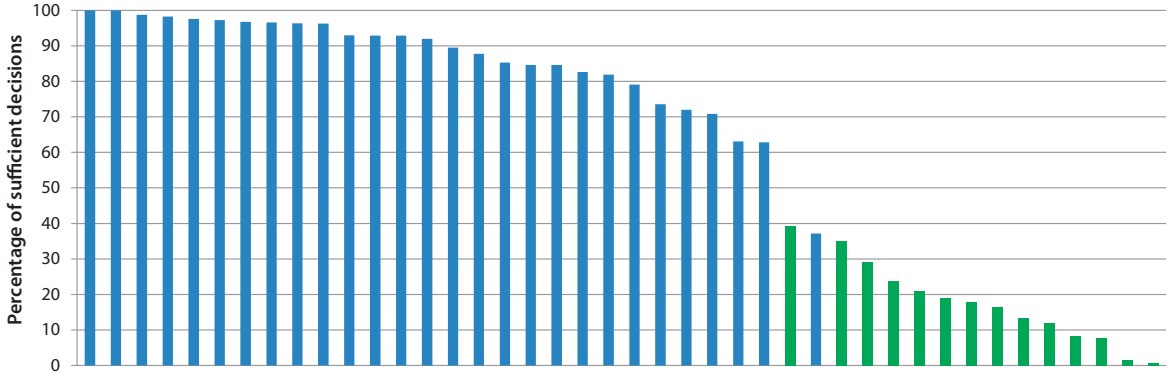
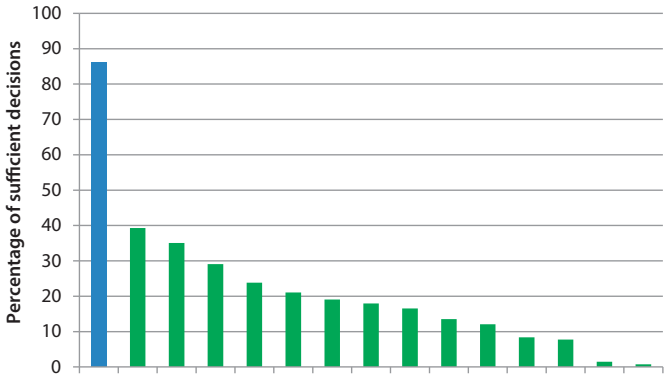


Figure 12: Percentages of positive conclusions regarding qualitative network sufficiency for Emerald countries (green) compared with the average for Natura 2000 (blue)



Interpretation of these qualitative data requires some care. As pointed out earlier above, in the case of the Emerald countries covered by the joint programmes, there is some time-lag in the submission of the datasets on which qualitative assessments are made, by comparison with the datasets used for quantitative assessment. The true qualitative picture for Emerald countries is therefore likely to be better than that indicated in the figures above.

As also mentioned earlier, the larger a given country, the harder it is to achieve high scores for sufficiency in the evaluation process, since countries with vaster national territories have more to do in order to reach the same sufficiency target. In the case of the Russian Federation for example, if some of the oblasts (devolved regional administrations) made enormously successful efforts in identifying all the sites required for the relevant habitats and species while other oblasts accomplished much less, the national-level performance may look unimpressive, yet in parts of the country which by themselves are large enough to equate to the entire national territory of a smaller country the result may be exemplary, making the comparison at national level potentially unfair. (This has previously also affected comparisons within the EU, where larger federal countries such as Germany and Spain have faced the same issue).

The ecological requirements of species and habitats in a fully-functioning network will best be met by a suite of sites that represents an appropriate range of variation in parameters of relevance (i.e. sites not all being the same as each other). One such parameter is site size. The range of sizes of nominated Emerald and Natura 2000 sites in different countries varies according to biogeographic factors, but also according to the general strategic approach taken by each country to coverage objectives. In the EU for example some countries have constructed national networks from a relatively large number of smaller sites (e.g. Germany), while others have done so with a smaller number of large sites (e.g. Spain).

In each of the studied countries however there are at least some examples of sites in every size class. In the EU there is also an almost linear overall relationship between sizes and numbers of sites, i.e. more sites in the small size classes and fewer sites in the larger size classes; but this is not the case in the Emerald countries. This is shown in Figure 13 below.

Ukraine

Figure 13: Classification of nominated sites according to size; comparing Emerald network sites (green) with Natura 2000 sites (blue).

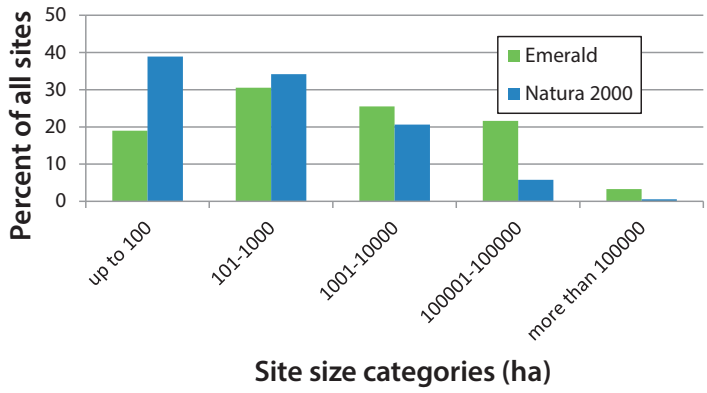


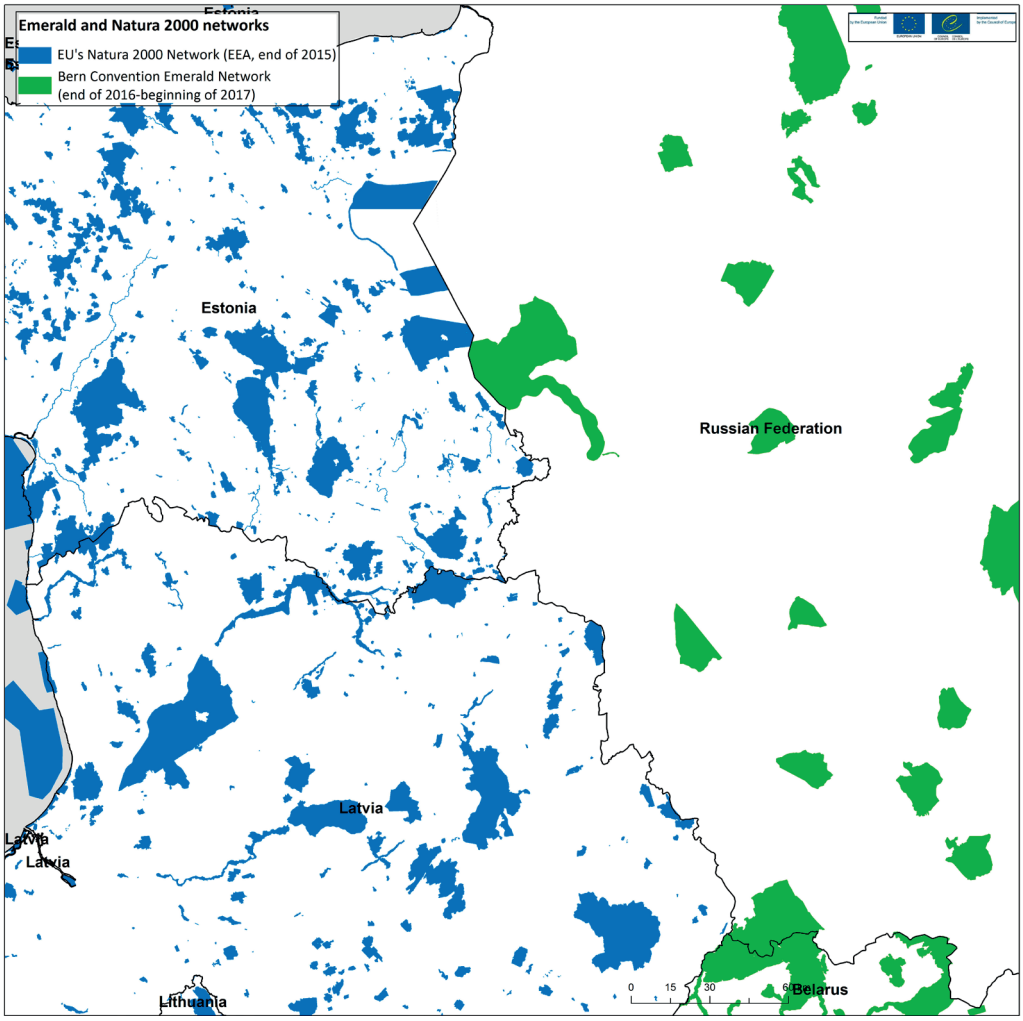
Figure 13 shows another notable difference between the Emerald countries and the EU countries, with Emerald sites on average being larger than Natura 2000 sites. This may partly be influenced by some particularly extreme situations such as the inclusion of a few huge sites in the Russian Arctic (see the map in Figure 2 above).

A closer look at the size class distributions in individual countries however (see Figure 15 below) shows a more general trend of Emerald countries having relatively low frequencies of sites in the smaller size classes – in particular for example Albania, Armenia, Azerbaijan, Belarus, Bosnia & Herzegovina, "the former Yugoslav Republic of Macedonia" and Ukraine. See also the contrast illustrated in Figure 14 below between the Emerald sites in the Russian Federation and the Natura 2000 sites in the neighbouring Baltic states.

This may raise a potential question about the degree of functional coherence at national level of the networks that have been constructed in these countries (offset perhaps to a degree in the Armenian case by the fact that in that country the percentage coverage of the total national territory is particularly high).

Small sites can often be important as "stepping stones" between other areas, playing a crucial role in dispersal, migration, and spreading of ecological risk factors. Less mobile or dispersible species may be particularly dependent on an appropriate distribution of such sites in the landscape, and the benefits for species in general will be particularly marked in regions with landscapes that are more fragmented, such as the Continental and Steppic biogeographic regions.

Figure 14: Illustration of the difference in typical site sizes between Emerald sites in the Russian Federation and Natura 2000 sites in the neighbouring Baltic states

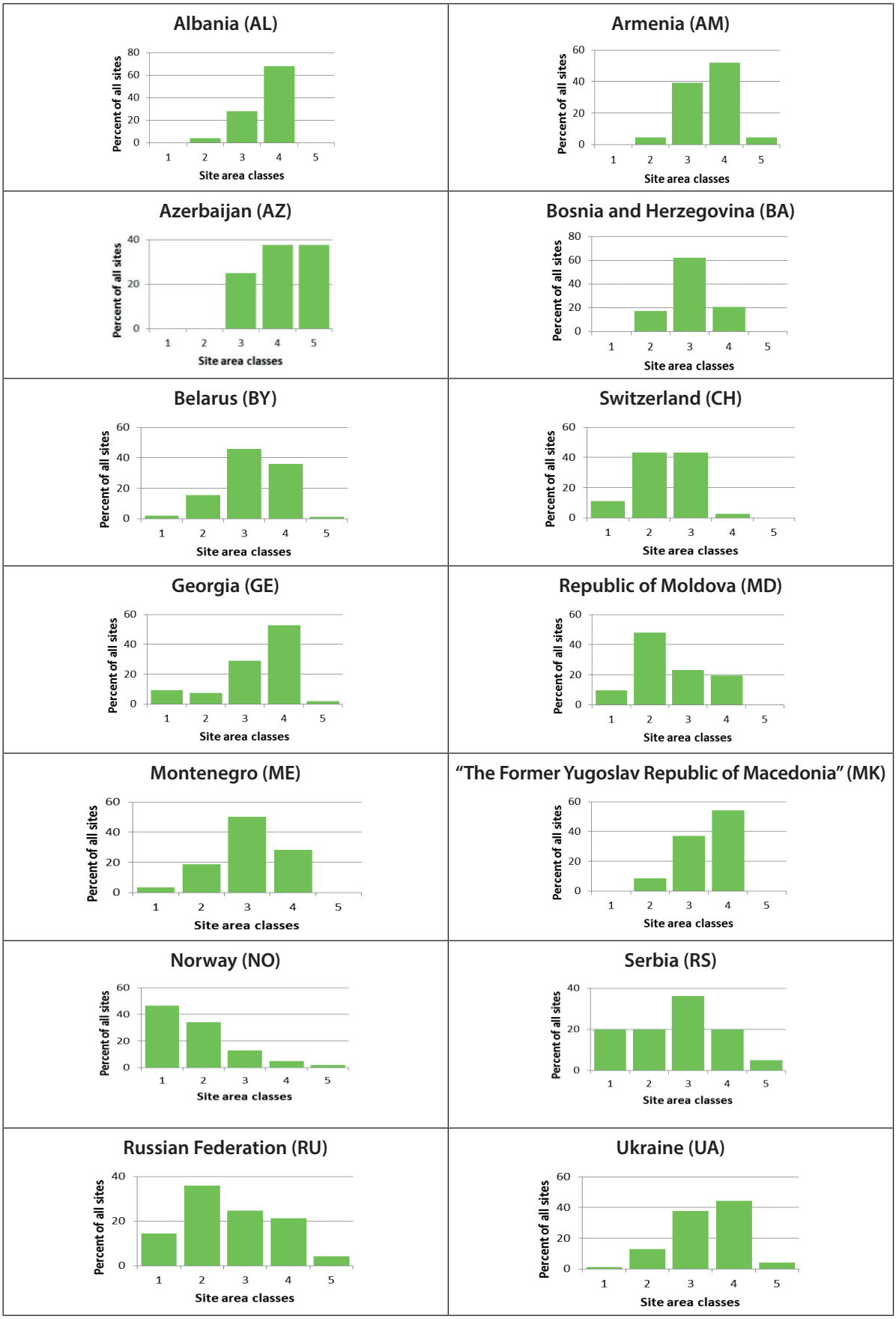


One final aspect of comparisons between the Emerald Network countries and the Natura 2000 Network countries concerns the gaps that remain in scientific knowledge, and the resulting priorities for future research. The results of the biogeographic seminars include findings that address this aspect, and these findings ("scientific reservations") are discussed in section 7 below.

Overall it can be seen that progress with the Emerald Network, although it began later than the Natura 2000 process, compares in general terms satisfactorily with the latter as far as proportional area coverage of identified sites is concerned (i.e. one of the parameters of relevance to Aichi Target 11), taking into account the effect of national territory extent in the case of particularly large countries.

The picture with regard to documentation of relevant species and habitats is more mixed; while the comparisons show the Emerald Network in a less favourable light with regard to qualitative sufficiency of the network, completeness of databases, information on individual sites, and the functional coherence of the network. These will all be areas for attention in future (see section 8 below); and with further support and assistance it is fully reasonable to expect that before long there can be parity of achievements between the Emerald countries and the EU countries, such that the resulting coordinated site network functions in the truly pan-European way intended.

Figure 15: Distribution of site area size classes in the Emerald network countries.



Key to classes: 1: up to 100 ha; 2: 101 to 1,000 ha; 3: 1,001 to 10,000 ha; 4:10,001 to 100,000 ha; 5: more than 100,000 ha.

Short-toed snake eagle *Circaetus gallicus* (Chachuna) Georgia (Otars Opermanis)

5. Assessing implementation progress

Success of the Emerald Network cannot be achieved by designations alone, but depends on securing defined conservation outcomes for the relevant species and habitats.

According to Bern Recommendation No. 16 (1989), once ASCIs have been designated by the States, the States are asked to ensure wherever possible that:

- the sites are subject to an appropriate regime designed to conserve the factors that are the basis for their inclusion in the Network (reference to "an appropriate regime" means that legal protection is not necessarily expected);
- the agencies responsible for management and/or conservation of the sites have sufficient training, equipment and resources (both human and financial) to enable them to fulfil their role;
- appropriate and coordinated research is conducted to further the understanding of critical elements in the management of ASCIs and the monitoring of their status; and
- activities adjacent to or in the vicinity of the sites do not adversely affect them.

The States are further recommended in respect of ASCIs to:

- draw up and implement management plans with short- and long-term objectives;
- regularly review the management plans in light of changing knowledge or other conditions;
- clearly mark the boundaries of ASCIs on maps and as far as possible also on the ground;
- advise landowners and relevant authorities about the location and important features of the sites; and
- provide for monitoring of the sites.

Further elaboration of these various core measures and of additional options (such as acquisition and incentives) is provided in Recommendation No. 25 (1991) and Resolution No. 8 (2012) and in a guidance document produced in 2014[11]. The Group of Experts on Protected Areas and Ecological Networks has also prepared draft guidelines on managing Emerald sites with particular reference to climate change adaptation and mitigation, which can be consulted on the Convention website[12].

11. Bern Convention (2014). Towards management of Emerald sites. Document T-PVS/PA(2014) 8 prepared for the 6th meeting of the Group of Experts on Protected Areas And Ecological Networks, Strasbourg, September 2014.
12. Bern Convention (2015c). Draft guidelines on managing the Emerald sites, including climate change adaptation and mitigation. Document T-PVS/PA (2015) 10 prepared for the 7th meeting of the Group of Experts on Protected Areas and Ecological Networks, Strasbourg, September 2015. Available at *https://wcd.coe.int/com.instranet.InstraServlet?command=com.instranet.CmdBlobGet&InstranetImage=2792842&SecMode=1&DocId=2298568&Usage=2*.

At present, as described in section 4 above, only a relatively small proportion of the identified Emerald Network sites have so far reached the stage of being adopted by the Bern Standing Committee and designated by the national governments concerned (Phase III of the Emerald process outlined earlier above). This means that it is currently too early to form a view about the success or otherwise of the actual conservation outcomes achieved.

The implementation progress that can be more appropriately reported at this stage therefore relates to the putting in place of the requisite *enabling mechanisms* such as legal protection and management frameworks. The present section is limited to commenting only on measures of this kind. (Other implementation issues relating to impacts on policy and on public benefit are covered separately in section 6 below). These measures, while constituting an important part of the delivery of the two Joint Programmes' objectives, are also an important contribution to delivering the various other international objectives for area-based conservation measures described in section 2 above.

During the first Joint Programme, all the countries proposed the main and most obvious "wilderness" areas in their territories to be part of the Emerald Network. Most of the areas concerned were already safeguarded in some way at national level, sometimes by strict forms of protection, backed by provisions in national legislation and often implemented through site-specific management plans.

As the Programme progressed, and as countries worked on filling ecologically-defined gaps in biogeographical coverage (both quantitatively and qualitatively, as described in section 4 above), it became apparent that a number of the areas identified for inclusion fell outside of any existing form of official protection. Measures such as agrarian land reforms had divided ownership of farmed land into plots of a few hectares each, meaning that control of habitat management was dispersed into the hands of millions of the country's citizens.

Legally, in such a situation, central government cannot intervene, thus posing a potential risk to the coherent conservation of biodiversity values. This applied not only to proposed Emerald sites but also to other international designations such as Ramsar Sites; although in the case of these in Ukraine for example, the government took steps to apply relevant national protected area status to the sites concerned, which therefore covers any case where the same sites have been proposed as part of the Emerald Network.

Emerald Network video in Georgian (Scienseed)

During the second Joint Programme, a Round Table event in January 2015, on "Setting-up and specifics of management of the Emerald Network in Ukraine", helped to generate recommendations for the Ukrainian Environment and Natural Resources Ministry on the particular steps that would need to be taken (including amendments to legislation) in order to ensure effective protection (and management) of the Emerald Network sites in that country. In July of the same year, a national Emerald seminar in the framework of the project "European Neighbourhood and Partnership Instrument: East Countries Forest Law Enforcement and Governance II Programme" (EU, World Bank, WWF and IUCN) focused on legal issues and the management of Emerald sites and protected areas.

As another example, in Belarus attention was similarly given to discussing the possible mechanisms that could be used to protect species and habitats in proposed Emerald Network sites which fell outside the existing national system of protected areas. Options examined for this included a system of management agreements to be contracted with landowners. The law on protected areas was amended in 2015 *inter alia* to make specific reference to protection of the habitats and species listed under the Bern Convention. During national meetings here in the context of the second Joint Programme, particular emphasis was placed on the subject of future management of Emerald sites. Representatives of all of the government Ministries taking part pledged that all relevant legislative and institutional provisions would be implemented so as to give protected status in future to those potential Emerald sites which did not yet benefit from it, so as to ensure the conservation of the relevant species and habitats that had been identified through the Bern Convention.

In Armenia, most of the proposed Emerald sites are covered by one or other of the categories of protected area status applied by that country's national legislation (natural monument, national park, important plant area, important bird area), although there are some which are not covered in this way and for which their protection is less legally secure.

In Georgia, two laws were drafted during the second Joint Programme which specifically refer to the Emerald Network. In the Law on Biodiversity, chapter 3 regulates the establishment and management of internationally significant networks of nature conservation areas, explicitly including Emerald sites. In the revised Forest Code, chapter 9 addresses the selection of areas of high conservation value under the Georgian Forest Fund, as well as forest use issues related to the Emerald Network.

The Russian Federation is another example where legal protection does not apply to all the areas identified as needing to be included in the country's Emerald sites (and where nature conservation responsibilities are highly devolved). In this case, the intention is for the issue to be partially overcome by the use of protective measures applying to the species concerned (based on national Red Lists), rather than to the areas as such. For particular habitat types too, it is proposed to develop officially adopted "Green Books" of rare and endangered ecosystems.

Concerning management, the process of identifying and designating Emerald sites involves very extensive collaborative efforts among a wide range of partners from government agencies, academia, NGOs and others. The very fact of having built such a broad and robust consensus about the value of the areas, and about the justification for their protection, is itself some assurance that planning and conservation management of them will proceed successfully.

An important ingredient in the practical protection of Emerald Network sites that it is possible to achieve rests with the contribution of NGOs and civil society organisations. In all participating countries, the implementing organisation for the Programme was the relevant national government authority responsible for nature conservation or equivalent matters; but in many cases this was done in cooperation with a national conservation NGO. Through the Joint Programmes, cooperation at national level between relevant Ministries in charge of nature conservation and active environmental NGOs has clearly become strengthened, through processes such as improvements in the exchange of scientific information. The important role of civil society in area protection and management has thus itself been strengthened in turn.

A Round Table event in the Republic of Moldova's State University in 2016 provided an interesting example of the promotion of the Emerald Network within the university community. Among other things this explored the scope for developing teaching curricula and research activities in ways which would help to support the management and monitoring required for the country's Emerald sites, using course content, fieldwork instruction and research projects as appropriate. The idea was extended to looking at ways in which this approach could then also involve collaboration with local schools and the wider community in the same endeavor. Overall therefore this provides a much greater capacity for contributing to the necessary work, while also helping to build long-term support for biodiversity conservation among the adult generations of the future.

Ukraine (E. Karpova)

6. Impacts at policy level, and wider public benefits

The two successive Emerald Network Joint Programmes represent a landmark in cooperation between the Council of Europe and the European Union. They have led already to impressive results, and to a remarkable degree of cooperation not only between the seven countries of Eastern Europe and the South Caucasus covered by the programmes, but also between the governments, civil society and scientific institutions within those countries.

The preceding section of this report has discussed the ways in which available national conservation measures can be (and are being) applied for achieving the protection and management of Emerald sites. The present section looks at how the process of Emerald Network development has operated in the reverse direction too, where the two Joint Programmes have been the driving force for new improvements in relevant national policy frameworks in the target countries. The section concludes by considering also the wider benefits for the public at large that are becoming apparent so far, and which are foreseen to grow in importance in future.

A key achievement, reported in all the programme years, was the development and spreading of awareness and understanding about the exact nature of the linkages between the Bern Convention and other international conservation frameworks such as the Convention on Biological Diversity, as described in section 2 of the present report above. The specific role of the Emerald Network in delivering relevant commitments thus became firmly established as a key ingredient of policy thinking on this in all the target countries.

In particular, the Network has formed an important component of the National Biodiversity Strategies and Action Plans (NBSAPs) adopted by nearly all the countries (Armenia, Belarus, Georgia, Republic of Moldova and Ukraine); not only in the sense of the content of these NBSAPs but also as part of the impetus for completing them during the programme period. This has therefore helped to ensure that the priorities to which the States have committed properly encompass the priority species and habitats identified by the Bern Convention. Azerbaijan now also has adopted a National Strategy on Conservation and Sustainable Use of Biodiversity (2017-2020) which similarly incorporates the implementation of the Emerald Network.

In the case of the Republic of Moldova this kind of congruence extended to the shaping of the legal framework for nature conservation at the national level, with the needs of the Emerald Network helping to define the scope of provisions for the management of protected areas under the jurisdiction of local authorities. All of the countries (at a regional workshop at the beginning of the programme in 2009) had also already agreed to pursue amendments of species and habitat lists annexed or otherwise incorporated in national legal instruments, where this would be necessary in order to align them with the species and habitats listed under the Bern Convention for the Emerald Network.

During the second Joint Programme in 2013, Belarus concluded the process of becoming a full Contracting Party to the Bern Convention. It is acknowledged by all concerned that a major part in bringing about this landmark achievement was played by both Joint Programmes, and it was one of the objectives of the first programme. The work to implement the Emerald Network in Belarus, including the development of an appropriate national regulatory framework, was a key factor in securing the country's accession to the Convention considerably earlier than would otherwise have been the case.

Work on Emerald built a greater familiarity among the target countries with the methods and principles applied to nature conservation in the neighbouring EU. It helped significantly with moves towards approximation of standards (including legal standards) for protection and management of nature to those defined by the EU. This was particularly important in those countries developing Association Agreements with the EU, as part of the necessary preparation for any future moves towards becoming a Member State of the Union.

For example, Association Agreements in the Republic of Moldova and Georgia were drafted during the programme period, and these drew upon the Emerald work in defining the scope and objectives of the biodiversity conservation component. In the Republic of Moldova this process served also to enhance the level of transboundary cooperation with Romania (and with Ukraine). Emerald Network implementation featured regularly on the agenda of meetings concerned with cooperation on environment protection between the EU and the Russian Federation, where a central focus was the harmonisation of the country's nature conservation standards with those of the EU. An evaluation of the Emerald programme activities by the national authorities in the Russian Federation in 2011 judged these activities to have been among the most successful and results-oriented of any in the context of this EU cooperation.

In Georgia similarly the Emerald work contributed to the launch of a project in 2015 on "Supporting the implementation of biodiversity-related EU Directives in Georgia", funded by the German international cooperation agency GIZ.

It is acknowledged by many that transboundary cooperation in the field of nature conservation and other environmental measures can be a significant contributor to efforts for mediation in zones of conflict, where the conflict has arisen in a different field of political relations altogether[13]. The Emerald process has seen conservationists, academic scientists, representatives of civil society and public authorities coming together in focused collaboration across countries which at the same time were involved in difficult disputes concerning areas such as Nagorno Karabakh, Trans-Dniester, North Ossetia, Abkhazia, Crimea and East Ukraine. There is a strong suggestion that opportunities for peaceful dialogue were enhanced by having the common purpose of programmes for establishing a shared network of important sites for nature.

Participating countries have acknowledged the role of the Emerald Network in supporting measures for the mitigation of the effects of climate change on the distribution and conservation status of flora, fauna and habitats. In Armenia the Emerald work was undertaken in close cooperation with the coordinator of the national programme for implementing the UN Framework Convention on Climate Change (UNFCCC), and it features as part of the country's national strategy for climate change adaptation and mitigation.

Included in this also was specific cooperation with a UNDP-GEF project on the preparation of Armenia's 3rd National Communication under the UNFCCC, which was supported by an analysis of the implications for species, sites and habitats of different future climate change scenarios in the context of the Convention. In 2015 the Emerald project team in Armenia reached a preliminary agreement with the UNDP Climate Change Programme to cooperate towards the implementation of the Emerald Network, with a focus on further impact assessment of climate change impacts within the Emerald sites.

Climate change links were also made in Georgia through the Emerald programme's input to a project on "Sustainable management of pastures in Georgia to demonstrate climate change mitigation and adaptation benefits and dividends for local communities", which was led by UNDP and the EU.

Work on establishing the Emerald Network has also added synergistic strength to the implementation of several other major projects. This often arises from the multiple use potential of the systematically compiled scientific data involved; but it has also benefited from the potential of nature protection to be a practical basis for achieving cooperation in situations where there may be difficulties connected with territorial disputes.

13. See for example Sandwith, T, Shine, C, Hamilton, LS and Sheppard, D (2001). Transboundary protected areas for peace and cooperation. IUCN Best Practice Protected Area Guidelines No. 7. IUCN - World Conservation Union, Switzerland.

Ukraine (E. Karpova)

One example of these synergies was the connection established (particularly in the Republic of Moldova and Ukraine) with the EU-funded European Neighbourhood Partnership Initiative's second East Countries Forest Law Enforcement and Governance programme (ENPI FLEG II), which covered the same seven countries as the Emerald Joint Programmes. This was a similar multi-stakeholder programme aimed at strengthening forest law enforcement and governance, and it concluded in February 2017.

In Armenia, the government adopted by decree a Development Strategy and Action Plan for Specially Protected Areas (2013-2020), which incorporates the Emerald Network sites and the legally-backed protection objectives that apply to them. In Belarus, the Emerald programme was coordinated with a GEF/UNDP project on "Mainstreaming Biodiversity Conservation into Territorial Planning Policies and Practices" and an EU/UNDP project on "Support for the development of a comprehensive framework for international environmental cooperation in the Republic of Belarus".

The Emerald project in Georgia led to increased cooperation with a number of international organisations operating in the country, including the World Bank, UNDP, KfW, GIZ and the EU, and this ensured that Emerald/Bern Convention principles and objectives were taken up for example in strategic policy-related projects concerning forest sector reform (the National Forest Policy and National Forest Code), Pasture Management Plans, and the Second National Action Program to Combat Desertification. Input was also made to a project on sustainable forest management supported by the Austrian Development Agency.

Also in Georgia the Emerald work formed an important contribution to the process of developing a new biodiversity law, designed to modernise and replace all previously existing legislation on biodiversity in the country. This therefore provided a well-timed opportunity for the Emerald progamme to have a major beneficial impact on the design of the future conservation regime.

In the Republic of Moldova, as well as featuring in the country's NBSAP and its EU Association Agreement, the Emerald work has helped to shape a National Ecological Network and a National Strategy on Environmental Protection for 2014-2020. The Laws on Animal Kingdom and Vegetal Kingdom have been amended in accordance with the Emerald lists of relevant species, while the Law on the Ecological Network has been amended to take account of definitions and other provisions of the Emerald Network.

A UNDP/GEF project on "Strengthening governance and financial sustainability of the national protected area system" took place in Ukraine from 2008-2011, and benefited from cooperative input from the Emerald programme. The project produced a national strategy for strengthening protected areas, created a public organisation (the Association of Protected Areas of Ukraine) and implemented a small grants programme for green tourism development based on protected areas in the regions of Volyn and Rivne.

Belarus, Georgia, the Republic of Moldova and Ukraine all put significant efforts into ensuring good coordination of the work on the Emerald Network at inter-ministerial level. Georgia may be regarded as having been a pioneer in this, with its organisation not only of coordination and consultation meetings between all the relevant authorities, but also awareness-raising and advocacy events. In this way the path was smoothed for the processes, objectives and benefits of the Emerald Network to be important factors in shaping in the country's environmental strategies, policies and legislation.

The instances described above provide an illustration of the way in which practical project implementation can have a profound impact on strategic and long-term frameworks of policy and law. This is an important form of impact which occurs "upwards", from "ground-level" activity up to the overall orientation of a government's enduring aims and attitudes. It shows how practice can become translated into policy (a phenomenon which is not always so readily appreciated as the more typical view of new policies being the engine that drives new actions). It also makes it more likely that strategies and policies will be grounded in sound science that has been tested and validated in real life situations, which in turn gives a basis for greater political confidence in the directions being chosen. This is an important lesson for technical assistance programmes in a general sense.

Wider public benefits

The agreed objectives of the two Joint Programmes, as described in section 2 above, were to undertake the data compilation and scientific work necessary for identifying the Emerald sites and to achieve the operational launch of the Network. Apart from generally raising the public profile of the sites and facilitating local participation in their conservation, there was no component addressing the possible benefits to society. Even if there had been, no proper baseline exists against which to evaluate change of this kind.

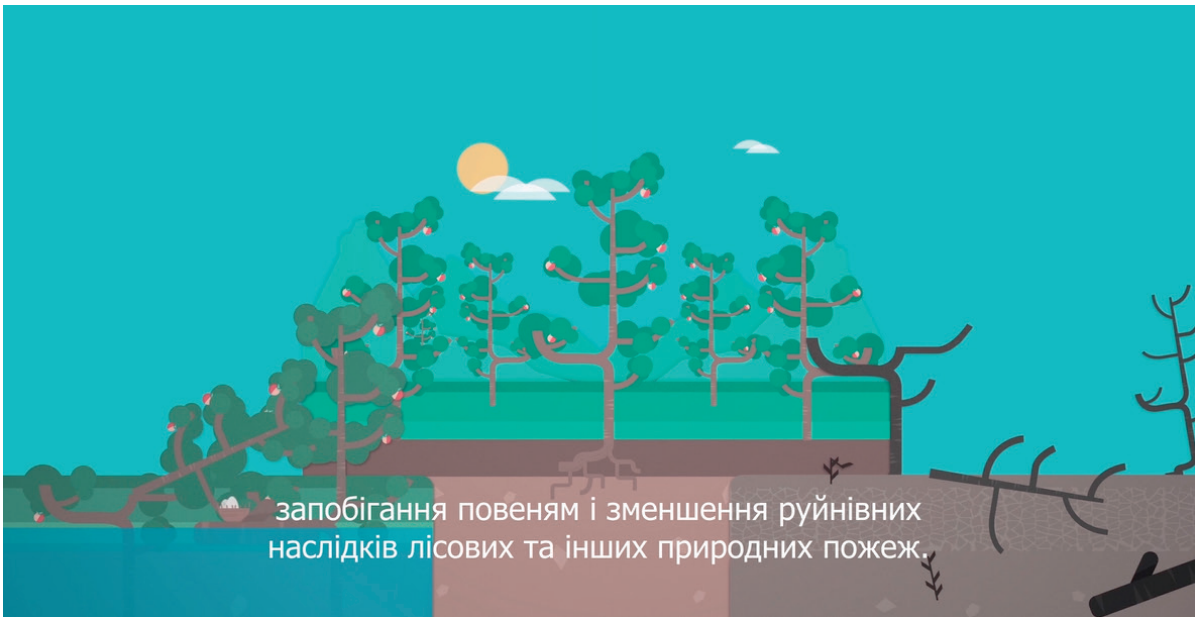
Nonetheless, it is important to note that improving awareness of natural environment values, and safeguarding the most important sites, does have a range of material, economic, social and cultural benefits for local communities and for the wider public at large. In the case of an ecological network such as Emerald there is the added dimension of how this is geographically distributed, and the contribution it makes to a country's "green infrastructure".

During the programme, all the countries engaged in dedicated visibility activities to raise the profile of the Emerald Network and its ideals, ranging from publication of books and leaflets to special events both for adults and children. In addition a particular success was the extent to which a broad range of actors and stakeholders played a part in the actual work of developing the Network.

This was therefore not merely an academic or governmental process, but rather it drew huge participatory involvement from the NGO sector and civil society. This indeed was very necessary in countries where the State authorities by themselves have limited resources and/or do not necessarily have access to all of the research and survey data that exist – in this context the role of "citizen science" has been nurtured in a positive way through the project. It represents furthermore a highly cost-effective way of leveraging extra delivery from the investment made in the formal project contracts.

In the cases described above where policy and legislative reform were stimulated by, or otherwise took place in conjunction with, the development of the Emerald Network, an element of democratic engagement in these processes was linked to the extent of stakeholder involvement in the Emerald work itself.

Research already undertaken on the Natura 2000 network in the European Union is likely to be a reasonable indication of conditions also applying to the Emerald Network in the neighbouring EaP countries. A recent European Commission survey[14] found that 80% of citizens in the EU consider biodiversity conservation to be a serious issue, with 60% saying they are or will be personally affected by the degradation of nature. A majority felt that conservation regulations should be more rigorously enforced, and that destruction of nature should not be traded for economic development; while also noting that a biodiverse environment is itself important for long-term economic prosperity.



Emerald Network video in Ukrainian (Scienseed)

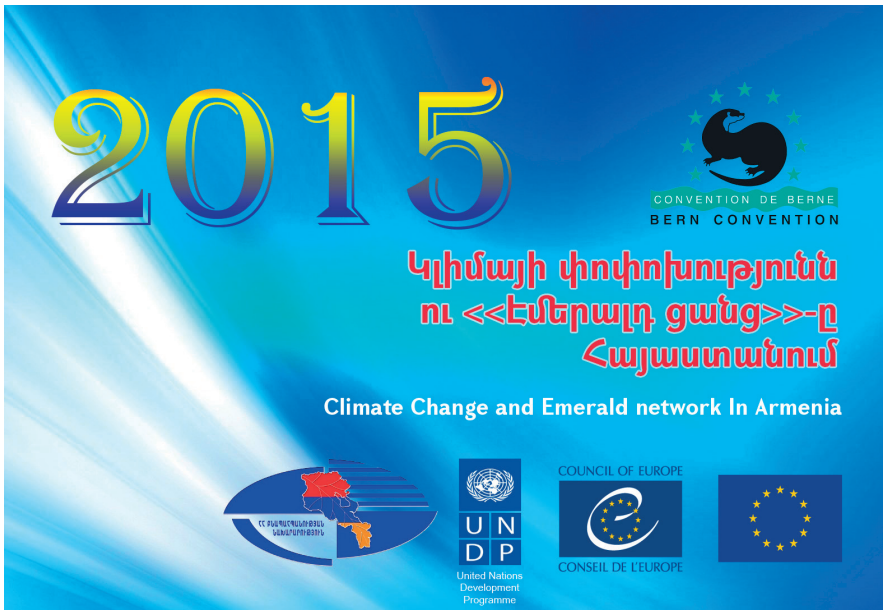
14. European Commission (2016). Fitness check of the EU nature legislation (Birds and Habitats Directives). Commission staff working document SWD (2016) 472 final. Brussels. (The figures given are derived from "Eurobarometer" analyses).

It is generally accepted that good levels of public awareness and active engagement are among the most important factors leading to positive behaviour change and thereby ensuring success in the implementation of conservation programmes. In this sense the inclusive approach achieved by the Emerald establishment work bodes well for the future protection of the sites in the longer term. This will be all the more true if day-to-day management of the sites takes a similar approach.

The benefits to people of green infrastructure, ecosystems and biodiversity have been extensively analysed, and demonstrated to be much greater and more diverse than the merely visible benefits of (for example) food and materials. The main conceptual framework and worldwide evidence base for this was most comprehensively developed by the Millennium Ecosystem Assessment, which itemised the various forms of provisioning, regulating, supporting and cultural services which naturally-functioning ecosystems provide[15].

A further thorough treatment of economic benefits in particular has been offered by the global TEEB initiative (The Economics of Ecosystems and Biodiversity)[16]. This showed how prosperity and poverty reduction depend on maintaining the flow of benefits from ecosystems, and that the costs of restoring or compensating for the loss of "natural capital" can often be much more than the costs of the conservation regimes that aim to prevent its loss in the first place. The Emerald Network has become a primary tool for exactly this safeguarding of natural capital, which the studies show is fundamental to the economic well-being of human societies.

Some of the benefits are more subtle, though no less profound. Engaging with greenspace and biodiversity has a positive effect on people's mental health as well as their physical health, and it has been shown to help in promoting social cohesion[17]. The cultural services provided by ecosystems support this too, by underpinning the spiritual well-being and renewal of individuals, and fostering aspects of the sense of identity and sense of belonging that is felt by communities. When these factors are not present, or when they are eroded, a much greater drain on reactive public social support systems tends to result.



Calendar on Climate Change and Emerald Network in Armenia

15. Numerous publications, but see principally: Millennium Ecosystem Assessment (2005). Ecosystems and Human Well-Being: synthesis report. World Resources Institute, Washington DC.
16. Numerous publications, but see principally TEEB (2010). The Economics of Ecosystems and Biodiversity: Mainstreaming the Economics of Nature: a synthesis of the approach, conclusions and recommendations of TEEB. Published by UNEP for the TEEB study.
17. See for example Pretty JN, Peacock J, Hine R, Sellens MH, South N and Griffin M (2007). Green Exercise in the UK Countryside: effects on health and psychological well-being and implications for policy and planning. *Journal of Environmental Planning and Management* 50(2): 211-231.

The distributional aspect of the Emerald Network has been mentioned above. The efforts made to fill gaps in biogeographical coverage of species and habitat distributions in the target countries, while undertaken purely according to strict criteria determined by ecological science, has had the fortunate by-product of enhancing the likelihood that more people will have access to high nature-value greenspace and contact with biodiversity, both because of their greater awareness of its existence and location, and because Emerald Status improves the chances that these areas will be safely maintained for the future. Protected area systems that focus predominantly on remoter wilderness areas, or on exceptional hotspots in a particular region, do not offer this particular advantage. The "sufficient network" concept that forms part of the Emerald approach is therefore especially important for this kind of public benefit.

Shortly after the start of the Joint Programmes, cooperative links were established with an EU DG EuropeAid project developed by Arcadis Belgium and entitled "Analysis for ENPI countries of the social and economic benefits of enhanced environment protection". This produced an extensive synthesis report in November 2011 which includes information on the benefits of protected areas in the countries concerned[18].

Studies on Natura 2000 in the EU give some further indications of the economic and social impacts which the Emerald Network is likely to have in the project countries. For example, the economic values of Natura 2000 were estimated in research for the European Commission in 2013[19]. Combining the valuations of a range of ecosystem services provided by the sites produced an overall estimate of some 200-300 billion Euros per year, a figure which far outweighs the roughly 5.8 billion it costs annually to protect and manage the network. Around 4.4 million jobs and 405 billion Euros in annual turnover are estimated to be directly dependent on healthily maintained ecosystems, a significant proportion of which lie within the Natura 2000 sites.

The EU study concluded that having a fully operational Natura 2000 network encourages a more coherent and resource efficient use of natural capital, as well as fostering a more sustainable and inclusive growth economy. It is also seen as leading to a more integrated and cohesive trajectory of development which brings together complementary economic activities that rely on healthy ecosystems. Part of this includes new business opportunities, for example in green tourism and recreation (worth some 50-85 billion Euros per year in Natura 2000) and innovative practices for sustainable farming and fishing. All of these impacts could reasonably be assumed to arise from the Emerald Network in similar ways.

In both the EU and the ENPI countries there is nevertheless still insufficient recognition in policy and public awareness of the multiple benefits provided to society by the respective networks of nature conservation sites. Some interests still often perceive these networks as primarily imposing restrictions and extra financial burdens. Proper "internalisation" of costs, and a relating of these costs to the benefits which outweigh them, has therefore not yet been achieved[20]. There can also be inequities between those bearing the costs and those reaping the benefits, hence the need for well-designed provisions for incentives and compensation in certain circumstances.

For the future, further research on the different dimensions of societal benefit, and extensive stakeholder consultations as part of this, will make more visible the real value of a fully functioning Emerald Network, and will help to maintain the level of public support it truly deserves.

18. ten Brink P, Bassi S, Farmer A, Hunt A, Lago M, Larsen B, Spurgeon J, Tucker G, Van Acoleyen M and Van Breusegem W (2011). Analysis for European Neighbourhood Policy (ENP) Countries and the Russian Federation on social and economic benefits of enhanced environmental protection. Regional synthesis report on Armenia, Azerbaijan, Belarus, Georgia, Moldova, Russian Federation and Ukraine.
19. Bassi S, Badura T, ten Brink P, Daly E, Dickie I, Ding H, Gantioler S, Gerdes H, Hart K, Kettunen M, Lago M, Lang S, Markandya A, Mazza L, Nunes P, Pieterse M, Rayment M and Tinch R (2013). The Economic benefits of the Natura 2000 Network: Synthesis report. Report of contract for the European Commission: Estimating the Overall Economic Value of the Benefits provided by the Natura 2000 Network. Prepared by Institute for European Policy for the European Commission, DG Environment. Luxembourg.
20. European Commission (2016), *op cit*.

Georgia

7. Remaining gaps and weaknesses

The two Joint Programmes were ambitious, complex, required new working structures to be put in place and addressed issues that were new to many of the contributors and participants. In the early stages therefore inevitably there were a number of challenges to face, but with good management and committed engagement by those concerned, for the most part these were successfully overcome. Examples include:

- Some countries struggled initially with aspects of the technical processes of data handling, for example with GIS systems, but skilled guidance from the Bern Convention experts gave much-appreciated help with this.
- Several of the teams found that the relevant existing datasets on status and distribution of habitats and species in their countries were decades old and the information was out of date. This was cited particularly by Belarus, Georgia and Ukraine, but it is a general feature of many of the post-Soviet countries. Consequently new field data collected in individual proposed ASCIs did not always match up with national distribution maps and species population figures. The Emerald project has made a vast contribution to improving this situation, although further work remains to be done.
- Gaps in knowledge about the status and distribution of relevant species and habitats required new collaborations to be established, both in terms of institutional links and in terms of looking for synergies with other projects (cited particularly in the case of the Russian Federation where these challenges were considerable).
- Some early ambiguities concerning the delimitation of biogeographic regions (Alpine-Urals and Black Sea) were resolved by special coordination discussions between the Russian Federation and Ukraine that were made possible by the project.
- As mentioned in section 4 above, while identification of large and obvious qualifying areas generally proceeded well, smaller sites, and sites going beyond existing protected areas, were often under-represented; and while major efforts during the second programme period improved this situation considerably, some weaknesses remain. In Armenia, Azerbaijan, Belarus and Ukraine for example there may still be a question in this respect about the full functional coherence of the network identified so far; although in Armenia's case the overall percentage coverage of the national territory is higher than the others.
- Securing engagement of relevant official authorities was challenging in some cases. In Georgia it took time to build effective working relationships with the body responsible for project outputs, the national Agency for Protected Areas (Ministry of Environment and Natural Resources), but major support was provided by the expert work of an NGO (NACRES) despite the compressed timeframe it had to operate in. The complex shared responsibilities in the Russian Federation led to a very mixed picture of engagement among the 50 regional authorities involved there, and the federal Ministry (Natural Resources and Environment) did not always engage fully either (see discussion in section 4 above). At the same time however the scientific efforts of the Russian Federation's national Emerald team were among the most productive of any of the countries.

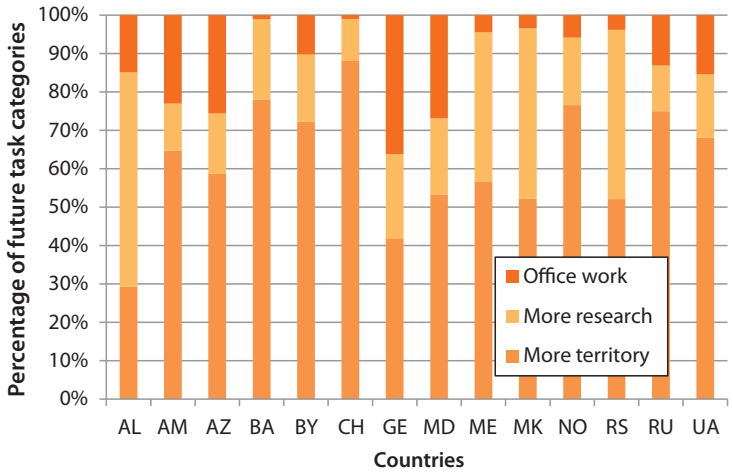
The list of habitats requiring conservation attention in Bern Convention Resolution No. 4 (1996) was updated in 2011, and the list of species in Resolution No.6 (1998) was updated in 2014. During the project, work was therefore required to re-examine the evolving proposals for network sites to take account of these changes in the lists. In some countries there is a continuing need to give attention to this.

Conversely, as discussed in section 4 above, the revised lists in the two Resolutions are still not comprehensive in their coverage of relevant important interests that have a particularly eastern distribution in Europe. As a basis for complete site networks in these more easterly areas therefore, a case has emerged for further adjustments to be made to the two Resolutions, following which the adequacy of the national site networks should be examined again in respect of the items added to the lists. In some cases (Azerbaijan is cited as one example), knowledge of the status and distribution of the species or habitats potentially needing to be added is an issue which itself needs further work on the ground (field survey), in order to verify the case for addition.

The biogeographic evaluation seminars have produced conclusions about network sufficiency which may indicate in a given case that no further work is required to produce a sufficient network in respect of a given aspect (country, species or habitat in the region concerned), or alternatively that some work still remains to be done in relation to e.g. correcting data, filling data gaps, expanding site areas or adding further sites.

These findings can be combined across the seminars, and the relative proportions of different types of required further action can be categorised and then compared between countries. This is shown in Figure 16 below, where the types of action required to complete the network have been grouped into three categories labelled respectively "office work", "more research" (i.e. in the field) and "more territory" (i.e. improved site coverage). Different priorities are apparent for different countries: for example in Switzerland the priority is to nominate more sites, in Albania it is to undertake further research on the status and distribution of species and habitats, and in Georgia it is to improve the Emerald database.

Figure 16: Priorities in each country for future work required to complete the Emerald Network



The category "more research" arises from the category of seminar conclusions referred to as "scientific reservation", where a reasoned assessment of network sufficiency cannot be made without further work. In rare cases such a reservation may relate to a need to resolve an issue of scientific principle (e.g. taxonomy) or to re-analyse existing data. More commonly however it indicates a need for further research, often entailing new field surveys.

Two types of scientific reservation are possible. A reservation in respect of a Reference List (see sections 2 and 4 above) concerns a situation where further work is required to confirm the presence of a species or a habitat in the country for a given bio-geographic region. Some 56% of scientific reservations across the Emerald countries are of this type. A "general" scientific reservation refers to situations where further work is required to clarify numbers, area, distribution, ecological requirements or other specific parameters. In the summary statistics below both types have been combined, as they each imply similar levels of effort and investment to address the issue concerned.

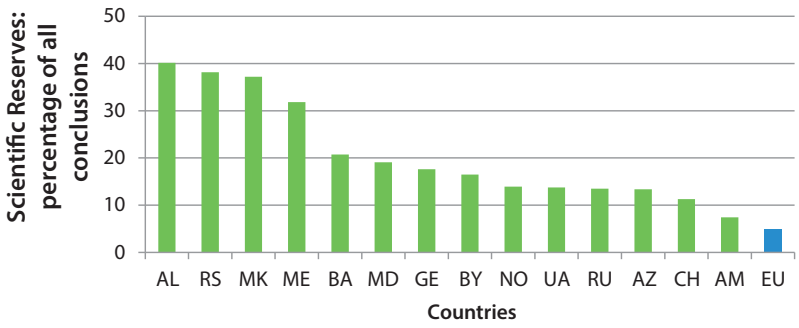
Figure 17 shows the relative frequency of scientific reservations (all types combined) recorded in relation to each country, biogeographic region and taxonomic group covered by the Emerald Network, plus the result for habitats. This can be read in effect as a portrayal of where the greatest future efforts for gap-filling research are required. In terms of countries, the needs appear to be greater in the West Balkan countries than

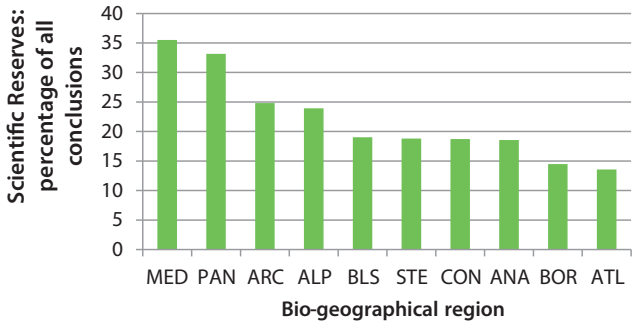
in those of the ENP group. Needs appear fairly evenly spread across the biogeographic regions, except for the Mediterranean region (Albania, Bosnia and Herzegovina, Montenegro) and the Pannonian region (Ukraine), where they are greater. Fish and invertebrates require more work than other taxonomic groups, and the level of reservations relating to habitats is also high. (The database allows this analysis to be presented for any combination of the categories shown).

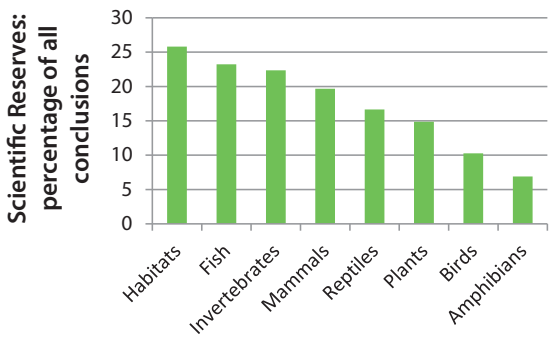
Figure 17 also shows the average frequency of scientific reservations recorded in the equivalent seminar process for the countries of the European Union (blue bar), and it can be seen that there is a significantly greater need for further research investment in the Emerald countries than in the EU, if the same level of scientific underpinning for their respective site networks is to be achieved.

After the identification of needs for further research (covered in the discussion above about "scientific reservations"), the third category of necessary future work shown in Figure 16 above is summarised as "more territory", and this need is the most prevalent of the three. Note that the percentages in Figure 16 reflect only this prevalence of the particular type of conclusion, based on the number of habitat/species features producing it – they do not reflect the scale of territories required, either in terms of area of in terms of numbers of sites. (It is in principle quite possible that multiple habitat/species deficiencies in a given case might be rectified by nomination of a single area that is important for multiple interests).

Figure 17: Comparative frequencies of scientific reservations recorded in Emerald Network seminar conclusions, across countries, bio-geographic regions and taxonomic groups; showing also the average for habitats. The country average for EU countries is also shown (blue bar)







Russian Federation (M. Vladimirovich Verevkin)

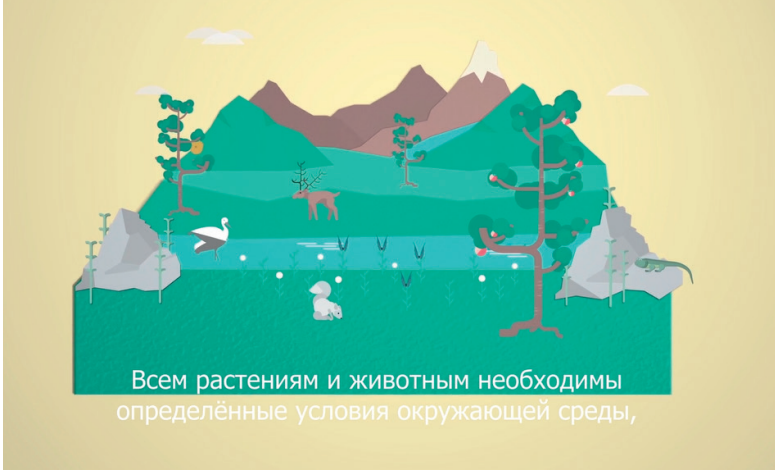
8. Continuing actions and future cooperation

Based on the issues described in section 7 above, a number of areas of action that are still required for completion of the Emerald Network in the target countries are apparent, including:

- work to address gaps in knowledge relating to the status and distribution of relevant species and habitats and relating to issues of ecological functioning;
- work to address the defined gaps in network coverage, such as improved spatial distribution, and better representation of smaller sites in places where this is currently deficient;
- achieving complete and sustained engagement of the relevant authorities at national and regional levels;
- reviewing national site proposals where this is still required in light of the 2011 and 2014 revisions of the Bern Resolution lists of species and habitats requiring special conservation measures;
- updating the Resolution lists themselves to take account of relevant important interests that merit inclusion but which, owing to their predominantly eastern distribution in Europe, have not yet been added;
- work to address biogeographic seminar conclusions concerning network sufficiency which indicate a need (for example) to correct data, fill data gaps, expand site areas or add further sites.

At its 30th meeting in February 2011, the Bern Convention Standing Committee endorsed a "Calendar for the implementation of the Emerald Network 2011-2020", detailing the different steps to be undertaken for the completion of the Network by 2020, including the strategic issues to be dealt with[21]. In December 2015 the Committee at its 35th meeting agreed an updated version of the Calendar[22], while retaining the commitment to completion in 2020.

21. Bern Convention (2010). Calendar for the implementation of the Emerald Network of Areas of Special Conservation Interest 2011-2020. Group of Experts on Protected Areas and Ecological Networks, Document T-PVS/PA (2010) 8 rev agreed by the 30th meeting of the Standing Committee, Strasbourg, February 2011.
22. Bern Convention (2015a). Revised calendar for the implementation of the Emerald network of Areas of Special Conservation Interest 2011-2020. Document T-PVS/PA (2015) 16 agreed by the 35th meeting of the Standing Committee, Strasbourg, December 2015.



Emerald Network video in Russian (Scienseed)

Achievement of the milestones identified for the phases of work covering 2011-2016 is detailed in earlier sections of the present report above. For the remaining period 2017-2020 the Calendar identifies the following steps:

2017-2019:

- Publication of the lists of the Emerald Network of Areas of Special Conservation Interest.
- Finalise the designation of Emerald sites in the whole Pan-European area, as well as in participating African countries.
- Full assessment of the Pan-European Emerald Network in view of the long-term survival of the species and habitats of European concern.
- Assessment of the adequacy of the Bern Convention's Appendices and Resolutions No. 4 and No. 6.
- (*In 2018*) First reporting exercise on the Emerald Network implementation for the period 2013-2018, as foreseen in Resolution No. 8 (2012).

2020:

- The Emerald Network of Areas of Special Conservation Interest is fully operational to guarantee the long-term survival of all species and habitats of European Interest, including appropriate management, monitoring and reporting tools, compatible with Natura 2000.
- Procedures for continuous updating of the data and evaluation of the long-term survival of the species and habitats have been put in place.

A Final Conference of the second EU/CoE Joint Programme ("Reaching concerted site conservation at pan-European level: progress, challenges and future of the Emerald Network") was held in Belarus in October 2016, and its outputs included the agreement of a "Road Map" of actions for the remaining period to completion of the Network, building on the Emerald Calendar[23].

The Road Map now constitutes the plan of key steps to be undertaken by relevant national authorities and others to achieve a complete and fully operational Emerald Network by 2020 in the seven countries of Central & Eastern Europe and the South Caucasus covered by the Joint Programme. In many cases this will involve capitalising on and intensifying existing efforts rather than necessarily embarking on new activities; and the technical foundations have been well built already by the substantial results of the two Joint Programmes.

Following the Belarus conference, the Road Map was endorsed by the Bern Convention Standing Committee at its 36th meeting in November 2016[24]. The Committee acknowledged the importance of the actions foreseen in the Road Map, particularly because they had been jointly planned by national authorities and relevant stakeholders in a concerted way. The Committee expressed its thanks to the European Union for its continuous support to the setting-up of the Emerald Network in the past 7 years and expressed its hopes that this generous contribution will continue in the future.

At the same meeting, the delegation of the Russian Federation (currently not a Party to the Convention) indicated that as a result of its work on the Emerald Network in the context of the Joint Programme, the Federation was considering possibilities for moving even further in cooperation with the Convention in future.

The Road Map provides more detail on the items included in the Calendar for the period from late 2016 to 2020, and is organised according to three "dimensions" (hence its title of "Three-dimensional Road Map") as follows:

- Actions for identifying and designating sites;
- Actions for protection and management;
- Actions for communication.

23. Bern Convention (2016b). Three dimensional Road Map for achieving a fully operational Emerald Network in 7 countries of Central and Eastern Europe and the South Caucasus. Document T-PVS/PA (2016) 10 agreed by the 36th meeting of the Standing Committee, Strasbourg, November 2016.
24. Bern Convention (2016c). Standing Committee 36th meeting, Strasbourg 15-18 November 2016: List of decisions and adopted texts. Document T-PVS (2016) 29.

Approaches in general to site identification, designation, protection and management have been discussed in earlier parts of the present report above. As the Network nears completion, the third dimension, "communication", becomes increasingly important. This is because in order to be fully effective, the Emerald Network will need to maintain high levels of public, political and institutional support. These in turn depend on prominent (and positive) visibility, easy access to information, inter-sectoral cooperation and good engagement by civil society. Actions defined on this topic in the Road Map (see below) may in due course be developed further and separately into a distinct "Communications Plan" for the Network.

In 2012, an Action Plan on the strategic development of the Pan-European Ecological Network (PEEN, which includes Emerald sites) for 2012-2020 was prepared by the Bern Group of Experts on Protected Areas and Ecological Networks. It contains proposals for raising awareness about the benefits of ecological networks (including Emerald) by means of short publications aimed at decision-makers and other stakeholders in various sectors. Sharing experiences with those who have undertaken communication activities to promote the Natura 2000 Network in the EU will also be important.

As well as maintaining the case for support, the credibility and efficient functioning of the Network will be aided by transparent access to information and efficient sharing of data. Bern Recommendation No. 5 (1998) stipulates that a database of information on ASCIs shall be public (except for anything classed as confidential), and that the Group of Experts will regularly publish lists of designated ASCIs. The Standing Committee also, in the guidance it agreed in 2013, decided that final detailed conclusions of the biogeographic seminars (see section 4 above) should be published on the Council of Europe website.

Monitoring and evaluation, as referred to in section 5 above, are only meaningful when associated with processes for reporting, and this is considered here as a further aspect of communication. Resolution No. 5 (1998) asks governments to inform the Secretariat of any changes likely to have substantial negative effects on the ecological character of a designated ASCI. Resolution No. 8 (2012) asks governments to report every six years on the implementation of the management measures they have planned and put in place for their Emerald sites, and the first of these reporting exercises is due in 2018. (The Group of Experts has been charged with developing a format to be used for this).

The actions agreed in the Road Map for the three different dimensions are set out below.

Russian Federation (M. Vladimirovich Verevkin)

Actions in the first dimension: identifying and designating sites

Organisation of the process
► Timeframes to be constructed for the action steps and milestones required to ensure that completion of each national network is achieved by the target date of 2020.
► National authorities to identify and make arrangements for fully involving all relevant stakeholder groups who may be able to contribute to the site identification and designation process, including sub-national authorities and civil society as well as the full range of scientists with relevant competences (bearing in mind for example the need to avoid biased emphasis on the more well-studied taxa and habitats). Consideration to be given to the need to organise special multi-stakeholder sub-regional seminars, especially to progress site identification and designation work in the larger countries.
► Explanatory and guidance materials on the Emerald Network site identification and designation process to be widely disseminated in relevant languages, to support the fullest possible involvement of all those who may be able to contribute. Newly summarised guidance on the processes (for example on sufficiency evaluations) may also be necessary to assist stakeholders who have lower levels of familiarity.
Data gathering and site identification
► Investigations to be undertaken into the potential contribution of additional sources of data from beyond the nature conservation field, for example forest inventories, agricultural land use classifications and water resources management data.
► Good use to be made of reputable "grey literature" and other reputable data and information sources in addition to peer-reviewed scientific publications, especially in situations where published research to date is limited and where conservation needs are urgent.
► In transboundary situations, data, consultation and evaluation to encompass inputs from both/all sides of the border/s concerned, including between EU countries and non-EU countries where applicable. Attention to be given to shared ecological systems, migration routes and corridors on an ecologically functional basis, and a Eurasian perspective to be born in mind where this is biogeographically appropriate.
► Areas regarded as "wilderness" to be included in consideration of possible sites, since lack of use/occupation does not equate to an absence of threat.
► Careful negotiation efforts to be planned where particular interest groups (e.g. landowners, hunters) may have a history of concerns or antagonism towards nature conservation designations.
► Where relevant, marine sites should receive equivalent attention and efforts as terrestrial ones in the identification and data gathering. The Bern Secretariat and Standing Committee to consider the establishment of a Group of Experts on marine conservation
Constructing a sufficient Network
► Each country to specify a programme of specific action steps (with timeframes) required to address the "sufficiency" conclusions relating to its own habitats and species, as produced by the relevant biogeographical seminars that have been undertaken so far.
► Sufficiency of national lists of sites to be assessed not only in relation to the Emerald criteria but also in relation to the Aichi Biodiversity Target 11 (which seeks effective conservation by 2020 of at least 17 per cent of each country's terrestrial and inland water areas and 10 per cent of its coastal and marine areas), bearing in mind that the percentage of territorial coverage is not a unique criterion for measuring success in achieving the Emerald Network objective: the long term survival of species and habitats of European importance (see also previous bullet point).
► In countries/biogeographic regions where good progress has been made towards sufficiency of coverage of species and habitats following initial evaluation seminars, options to be explored for convening second-round seminars in 2017 (notably in relation to non-avian species in the Caucasus and Boreal regions, involving Armenia, Azerbaijan, Belarus, Georgia, and Russian Federation or in Ukraine for end 2017/beginning of 2018). The Bern Standing Committee in November 2016 to make the requisite provision for this in its forward planning decisions. Bilateral meetings (as opposed to multi-country seminars) may be an appropriate solution in some cases in more distant future.

- Recommendations to be progressed for updating the lists of species and habitats protected through the Emerald Network (Resolution No. 4 of 1996 and Resolution No. 6 of 1998) to represent more completely the ecology of the seven countries. National authorities to complete the proposal pro-formas for this as required, and to consider indicating priorities in respect of the deficiencies that are perceived to be the most urgent. Regard to be had in this, where appropriate, to compatibility with comparable listings under other biodiversity-related Conventions.
- Attention to be given to the sufficiency of the Network on an on-going basis beyond the initial evaluation conclusions, since (1) 'natural' changes in species and habitat distribution and abundance (e.g. climate change) and (2) changes in knowledge may require further additions to the Network. This will ensure that sufficiency is maintained over the time.

Capacity and resources

- A variety of potential sources of financial and other support to be explored, including LIFE+, INTERREG and Eastern Partnership tools. The Bern Standing Committee to assist the seven countries in their efforts in this regard by providing high-level encouragement to governments and others in a position to offer such support. Options also to be explored for providing central guidance and advice on identifying and accessing potential sources of funding support.

Actions in the second dimension: protection and management

Protection

- Options to be clearly established in each individual case for the eventual appropriate regime to be used to conserve the designated areas (in the terms of Bern Recommendation No. 16 of 1989); whether this is to be full legal protection or some other suitably effective conservation measures.
- Examples of different approaches to legal site protection measures to be shared among the countries so that effort is not wasted in re-originating good models. Experience of transposition into national legislation of the nature Directives in EU countries to be included in this.
- The location and significance of candidate Emerald Sites to be reflected in relevant policy and planning instruments in non-conservation sectors as well as in conservation plans, for example in regional development strategies.
- Countries which have incorporated aspects of Emerald Network provisions into national legislation to document their approach and experiences of this, as case examples to assist others who may be considering doing likewise.
- The Bern Convention Secretariat to seek opportunities to organise a seminar/workshop on the legal issues for designation of Emerald Network in all countries dealing with its establishment.

Management

- Each country to define realistic and prioritised action steps for achieving eventual full coverage of its Emerald sites by suitable management plans, having regard to existing good practice guidance and experience where applicable (see below), and including *inter alia* attention to influences on the site from its surrounding landscape, and provisions for monitoring and reporting.
- Channels of knowledge transfer and capacity-building from EU countries to be explored so that the seven countries can benefit to the maximum extent from experience gained in the EU in establishing management measures and good practices for sites in the Natura 2000 network, particularly in respect of semi-natural habitats.
- Channels of experience-exchange and joint problem-solving to be explored between all the countries involved, and with their transboundary neighbours, so that successful methods and lessons learned can be shared.
- Steps to be taken to secure sources of external funding support for the development of site management plans.
- National Focal Points for the Emerald Network to coordinate with the Focal Points for other Conventions in each country to ensure experience-sharing and harmonised approaches to management planning, taking full advantage of methodologies and good practice standards which may already exist in these other frameworks (e.g. for wetland sites, the management planning guidelines adopted under the Ramsar Convention).

- To accommodate a variety of systems and mechanisms for delivering effective management of the sites, including those based on regulations and mandatory standards and those based on incentives and voluntary measures. To accommodate also a variety of levels of ambition concerning objectives and outcomes, provided that the minimum expectations agreed in Recommendation 16 (1989), Recommendation 25 (1991) and Resolution No. 8 (2012) are met.
- To make arrangements for fully involving all relevant stakeholder groups who may be able to contribute to the planning and implementation of site management, including the NGO sector as well as resource management agencies and competent scientists. Involvement may include, *inter alia*, sharing of information and data, direct delivery of management measures, participation in decision-making, and representation on relevant bodies having responsibility for the governance or oversight of management regimes.

Monitoring and effectiveness assessment

- Each country to make arrangements for monitoring of all of its Emerald Network sites, sufficient at least to ensure that any changes likely to have substantial negative effects on the ecological character of the site can be detected and reported to the Bern Secretariat (as agreed in Resolution No. 5 of 1998) and so that appropriate conservation responses to threats and changes can be initiated when required.
- Each country to define the mechanisms it will employ to monitor and assess the ecological effectiveness of the management of its Emerald Network sites, by reference to the conservation and management objectives defined for each site.
- Monitoring and effectiveness assessment of Emerald Network implementation to be integrated with monitoring of the implementation of the national biodiversity strategy and/or action plan for each country, as appropriate.

Actions in the third dimension: communication

Taking a strategic approach to communication

- To the extent that capacity permits, and with external assistance where possible, strategies/programmes for Emerald Network communication activities (possibly including public information campaigns) to be drawn up at national level in each participating country, on a joint basis between governments and NGOs.
- Bilateral and multilateral channels of communication to be developed and enhanced at both formal and informal levels between the seven countries, and between each of them and their neighbours, for increasing awareness about the setting up and operation of the Emerald Network.
- The Bern Secretariat to exchange information about the Emerald Network with other MEA Secretariats, seeking joint or harmonised approaches where appropriate on communication, education, participation and awareness work in relation to site networks in the Emerald area. The Bern Standing Committee to support this by giving encouragement to governments to ensure close liaison between the respective Focal Points of the different Conventions at national level.
- Examples of successful communication initiatives to be shared among the countries, and between NGOs and governments, so that lessons can be learned, existing materials can be adapted for wider use, and different approaches can be considered for different target audiences (schools, tourists, etc).

Enhancing dissemination and impact

- Articles and other communication and awareness-raising materials to be disseminated through available outlets not only of the primary implementing organisations but also through the websites, publications, social media platforms and other publicity channels of all relevant collaborators.
- The Bern Secretariat to enhance provision of guidance and other materials in user-friendly formats on the Emerald Network pages of the Convention's website.
- Potential sources of financial support to be explored in particular for additional translation of communication materials into relevant local languages, and for employment of skilled communication professionals to convert scientific and technical materials into attractive products for the public.

Georgia

All three "dimensions" of the Road Map are equally important and indivisible. Taken together, they provide a strong triangle of stability, not only for achieving a complete and fully operational Emerald Network by 2020, but for ensuring its sustainability thereafter. The future of Europe's wildlife and habitats depends on this.

Final recommendations, including future cooperation

The conservation objectives at stake with networks of important areas rely heavily on approaches which are harmonised, coordinated, and coherent in terms of spatial distribution and ecological functioning. The biogeographic basis for this for species and habitats in Europe is made possible by synergy between the EU regime for the Natura 2000 Network and the Bern Convention regime for the Emerald Network. The present report testifies to very impressive successes in this regard, thanks to cooperation between these two entities in the shape of the Joint Programmes reported here. As noted above, the Bern Convention Parties and the Convention Secretariat are keen to capitalise further on this success, in taking forward the remaining areas of necessary action on a similarly joint basis.

One important factor in this is timing: partly because of the rapidly-approaching target date of 2020 for completion of the Emerald Network; but partly also in the sense of the risk of losing momentum if there is any significant gap between the end of one period of activity and the beginning of another. An ideal basis for taking things forward now exists with the major consensus represented by the Road Map described above, and with the extensive networks of "human capital" and working relationships throughout the countries, as well as active data resources, that have been painstakingly built up through the work done so far. Before any of these things dissipate, there is a key opportunity now to launch a rapid follow-on phase of joint work.

The final recommendation of this report therefore consists of a structured proposal for a further phase of support from the European Union to complete key aspects of the tasks remaining; principally for putting in place the final ASCIs that will complete the Network (including the necessary final biogeographic evaluation processes), and providing a sound basis for implementing Phase III of Network establishment (as described in section 5 above), namely the on-going protection, management and monitoring of the sites. The proposed work would take place over three years, from mid-2017 to mid-2020.

There are already plans for some work to be funded by the European Environment Agency in 2017-2018 on elements of biogeographic seminar organisation and preparation of distribution maps – these elements are therefore excluded from the proposal presented here.

The proposal below is for a programme containing 12 actions grouped under three objectives, addressing respectively the biogeographic evaluation process, the management of sites and measures for monitoring & reporting. It is put forward on the assumption that the details would be developed in conjunction with the existing national Emerald teams and international advisers while these are still in place, and that the work would also be executed through them (thus avoiding the need to establish new teams, institutional structures and collaboration networks). Some suggestions as to the relative priority of the individual actions are included (meaning the priority for project support, not necessarily the inherent priority for implementation); but at this stage these are indicative only and are subject to further discussion.

Proposal for immediate further phase of work in 2017-2020

Objective 1: To complete the Emerald biogeographic evaluation process

Activity 1.1: Reviewing the lists of habitats and species in the Bern Convention Resolutions. *Priority: high*.

Review of Resolution No. 4 (1996) and Resolution No. 6 (1998) is required to adapt them to cover habitats and species that are conservation priorities in the areas now covered by the eastern extent of the Emerald Network. The work should be transparent and systematic, and should involve relevant suitably qualified NGOs and other scientific organisations (based on the existing Emerald teams), as well as consultation with other European countries outside the project area. At the outset this will involve developing or updating a methodology, drawing on the experience in the EU of adapting the Union's nature Directives to the accession of new Member States. Designing pro-formas for proposals from the individual countries would be part of this, and the proposals they submit would then be assessed by independent experts and forwarded for full evaluation by a biogeographic seminar or equivalent. The revised Resolution lists would then be the basis for subsequent sufficiency evaluations.

Activity 1.2: Continued support for the biogeographic evaluation process. *Priority: high.*

The European Environment Agency is planning to fund a second round of biogeographic seminars for the ENP-East countries in 2017-2018, to address the scientific reservations and insufficiency conclusions that emerged from the first round. There are, however, associated needs that this will not cover, and hence activity 1.2 here is proposed to enhance in particular the levels of engagement by relevant qualified NGOs, academic experts, and in some cases also government authorities. Preparatory workshops in advance of the biogeographic seminars would be a key mechanism for achieving this, supported by targeted outreach efforts to secure the involvement of the individuals and groups that is desired (backed by the incentive of opportunities for developing attractive research projects).

Activity 1.3: Promoting the use of the Emerald Viewer. *Priority: medium.*

The on-line Emerald Viewer, together with the Natura 2000 Viewer, has great potential to become an important source of information for the general public on protected areas and their conservation context. Information made available in this way will help to raise awareness about the natural environment, validate the quality and completeness of data, facilitate national and regional self-evaluation processes and stimulate new research studies. Familiarisation with the Viewer could be promoted through seminars and by publishing users' guides.

Activity 1.4: National workshops in preparation for the biogeographic seminars. *Priority: low*.

This activity envisages a process similar to that which was previously conducted in each country in 2014. The priority assigned to it is perhaps better characterised as "uncertain at this stage", because the need will be determined by the needs of the national Emerald teams, and they should be approached for their view. This will be determined by factors such as turnover of new personnel in the teams, new emerging questions to resolve, and country-specific weaknesses in knowledge, skills, confidence and/or engagement.

Objective 2: To advance the effective management of Emerald Network sites

Activity 2.1: Study tours to Natura 2000 sites. *Priority: high.*

During the first Joint Programmes the countries expressed a desire to benefit from the experiences of the EU by visiting Natura 2000 sites on study tours, and this activity aims to realise this idea. It should provide key knowledge-transfer benefits in relation to site management in particular. Two or three such tours could be organised, perhaps to destinations in the eastern part of the EU, and they could each be thematically focused on particular management topics and/or ecosystem types. Participation should be made available on an equitable basis to relevant practical stakeholders, and not for example just to senior ministry executives. Adequate provision for language interpretation should be built in as necessary (principally between Russian and English).

Activity 2.2: Reviewing existing management plans for designated Emerald sites. *Priority: high.*

As a basis for forward planning of management following Emerald designation, any existing management plans (or equivalent action frameworks) for the sites concerned should be reviewed in the context of the objectives for the Network. A workshop process could be the basis of a method for doing this, and relevant experience from Natura 2000 could be drawn upon[25].

Activity 2.3: Defining conservation objectives and management priorities for individual sites. *Priority: medium.*

Not every site can be expected from the beginning to have a full site management plan; but they should all at least have some statement of conservation objectives and possibly an expression of key priorities for management. Activity 2.3 would support the development of these, closely linked to the features of conservation importance that are documented in the Emerald Standard Data Form (SDF) for each site. The national Emerald teams would be the primary implementers of this. It appears that there is also a need for greater clarity in interpreting the "management status" section of the SDF, and attention would be given to this at the same time.

Activity 2.4: Development of new site management plans. *Priority: medium*.

Given the large scale of what this could entail, it is proposed here only on a selective basis. The intention would be to focus on a few example cases where a high priority need exists, and/or where there is particularly good potential to use the process as a pilot demonstration project, for involving stakeholders and helping to build relevant capacities on a wider basis.

Objective 3: To animate enhanced processes for monitoring & reporting

Activity 3.1: Development and growth of "citizen science" initiatives in support of monitoring & reporting. *Priority: high.*

A certain amount of government-run biodiversity monitoring can be undertaken by professionals within the limits of public funding budgets. The scale of this can be magnified hugely however by additional field observation and data-gathering efforts undertaken by NGOs and civil society; and in many countries (in western Europe particularly) this now makes a major contribution to scientific knowledge, and to the ability of public authorities to be responsive to the changing status of species, habitats and sites. In eastern Europe such approaches are much less developed, and for the purposes of Emerald Network monitoring & reporting, Activity 3.1 is proposed for identifying relevant networks and institutions and developing the guidance and recording systems etc to make such initiatives operational in these countries.

Activity 3.2: Development and enhancement of web-based biodiversity data portals. *Priority: high.*

Future models of data transfer and availability are likely to be increasingly based on interactive websites, where records can be deposited, filter-based analysis queries performed, and general public access made available to the evolving knowledge base about the natural environment. Some countries e.g. in the EU (but also Emerald countries such as Norway) already operate such systems and use them as a primary resource for helping to generate monitoring reports, but in others these systems are either less well developed or do not yet exist. Activity 3.2 would provide seed investments and technical advice for developing (or enhancing, as appropriate) data portals of the kind described.

Activity 3.3: Capacity building for monitoring & reporting. *Priority: medium.*

While formal monitoring & reporting requirements in relation to the Emerald Network under the Bern Convention maybe familiar to government National Focal Points, other stakeholders often have less familiarity, yet they are among the ones who can play an important role in the provision of relevant information. Familiarisation mechanisms for these groups could take the form of short capacity-building workshops, which could conceivably be organised in conjunction with the future biogeographic seminars being planned by the European Environment Agency as mentioned above.

Activity 3.4: Specific support for reporting processes. *Priority: low*.

The targeting of this activity would be specified in more detail following an assessment of priority needs, but it would be designed to support the reporting processes under Bern Resolutions No. 5 (1998) and No 8 (2012) as described in the Road Map above, with a view particularly to ensuring the necessary levels of completeness, timeliness, transparency, accountability and efficiency.

It can be seen that a particular emphasis in the proposal above is given to methods for collaborative engagement across statutory authorities, qualified experts, the academic world, NGOs and civil society/the general public at large. This reflects the clear lesson which has emerged from the Emerald Network programmes concerning the benefits that flow from good public engagement in its various forms, and in turn the benefits to wider society that result, as discussed in section 6 above.

Further work of this kind in a follow-on programme as described will be able to take advantage of new understandings about (for example) communicating ecosystem services concepts and designing environmental education for social resilience. It should therefore lead to even greater impact in these areas in the future, in addition to the impact it achieves in respect of the primary nature conservation objectives that remain compatibly enshrined in both the EU Directives and the Bern Convention.

This report presents the results of two consecutive Joint EU/CoE Programmes aiming at improving biodiversity conservation in the Eastern Partnership countries (Armenia, Azerbaijan, Belarus, Georgia, the Republic of Moldova and Ukraine) and the Russian Federation, through the setting up of the Emerald Network of Areas of Special Conservation Interest under the Bern Convention. The programmes were jointly run by the European Union and the Council of Europe from 2009-2016. The report takes stock of the results achieved, the lessons learned and the indications of likely longer-term impact. It concludes by specifying a number of remaining actions required and opportunities for further cooperation.

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