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AND NATURAL HABITATS

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PROPOSAL FOR GUIDANCE ON DETECTING, ASSESSING, REPORTING AND RESPONDING TO CHANGES AND LIKELY CHANGES IN THE ECOLOGICAL CHARACTER OF EMERALD NETWORK SITES

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SUMMARY

S.1 Bern Convention Resolution No. 5 (1998) asks governments to inform the Secretariat about changes likely to affect negatively in a substantial way the ecological character of the designated sites in the Emerald Network, so that the Standing Committee may be able to advise on appropriate steps to take. No guidance has previously been adopted however on defining or interpreting the concept of "ecological character" in this context, nor on the necessary associated matters of choosing the baseline state against which to judge change or the risk of change; monitoring to detect change or potential change, judgements about the significance of change, and options for adaptive responses to change.

S.2 Taking account of closely related regimes in other international fora, an initial review of these issues was considered in 2017 by the Standing Committee, who then mandated the Secretariat to develop some appropriate preliminary guidance, and to examine relevant case file experiences for any light which those might shed on the matter. The present document responds to this, by proposing fifteen guidelines (and an accompanying rationale for each) designed to assist Parties in implementing Resolution No. 5 (1998) and other related provisions. No new requirements are involved.

S.3 A summary of what the proposed guidelines cover is as follows:

Guideline 1 clarifies an understanding about the conservation objective for each Emerald site in terms of maintaining the site's ecological character, and the links between this and other objectives defined under the Convention. *(Paragraphs 2.1 - 2.9).*

Guideline 2 provides a definition of ecological character for Emerald Network purposes. *(Paragraphs 3.1 – 3.9).*

Guideline 3 explains how a description of the ecological character of a given site can be compiled, based on information already recorded in the ASCI Standard Data Form. *(Paragraphs 3.10 – 3.15).*

Guideline 4 gives advice on taking account of known natural variability, in deciding the correct benchmark or baseline conditions to be reflected in an ecological character description. *(Paragraphs 3.16 – 3.18).*

Guideline 5 indicates the way in which simple conceptual models can help to crystallise the key aspects of the ecological character of the site; and the accompanying text identifies examples and sources of further support in this regard. *(Paragraphs 3.19 – 3.27).*

Guideline 6 provides a definition of change in ecological character, and the scope of this in the Emerald Network context. *(Paragraphs 4.1 – 4.9).*

Guideline 7 gives advice on judging whether a change is likely to have a "substantial effect" for the purposes of Resolution No. 5 (1998), and the importance of taking a precautionary approach (meaning "if in doubt, report"). *(Paragraphs 4.10 – 4.19).*

Guideline 8 promotes the putting in place of arrangements in each country for monitoring and surveillance of the Emerald Network sites. *(Paragraphs 5.1 – 5.7).*

Guideline 9 sets out the key elements of a system for monitoring the achievement of conservation objectives for an Emerald Network site, as well as the basic steps for developing and operating such a system. *(Paragraphs 5.8 and 5.11).*

Guideline 10 sets out the key elements of a system of surveillance for detecting change or likely change in the ecological character of an Emerald Network site, as well as the basic steps for developing and operating such a system. *(Paragraphs 5.9 – 5.11).*

Guideline 11 gives advice on the assessment of the particular risks that might be deemed likely to have negative effects on a given Emerald site, as a basis for cost-effective tailoring of surveillance efforts. *(Paragraph 5.12).*

Guideline 12 gives advice on the use of "early warning indicators" in this context. The accompanying text discusses approaches to judging "likelihood" of change, and the importance of taking a precautionary approach (see also Guideline 7). *(Paragraphs 5.13 – 5.22).*

Guideline 13 highlights the role of Environmental Impact Assessment and Strategic Environmental Assessment in assessing the implications of likely change once it has been detected. The accompanying text identifies existing international standards and frameworks which will help with this. *(Paragraphs 6.1 – 6.5).*

Guideline 14 introduces a "mitigation hierarchy" for response options, and emphasises that network-level factors need to be considered alongside site-level ones. *(Paragraphs 6.6 – 6.18).*

Guideline 15 addresses the role of the Convention's case file system; and the fact that good monitoring, surveillance, early detection of problems, reporting and rapid responses in accordance with Resolution No. 5 (1998) can help to avoid the need to embark on the weighty process of opening a case file. The accompanying text offers some suggestions for the future operation of the case file system, to help it to support ecological character change issues in the most effective way. *(Paragraphs 7.1 – 7.12).*

S.4 The guidelines offered here are not intended as a prescriptive recipe for implementation of the Bern Convention's requirements concerning the Emerald Network. They simply provide a logical outline of elements to consider, and steps that can usefully be followed to design and operate a scheme that will be appropriate for the intended purpose, while in each case fitting the circumstances of the country concerned. They are accordingly designed to be sufficiently simple, flexible and practical to be implemented across a range of different situations.

S.5 Given the advances made in recent times to expand the Emerald Network towards full completion, yet the constant levels of challenge to its objectives that are posed by pressures of land use change and developments of various kinds, there is a greater need than ever for the Bern Convention and its Parties to be equipped with an effective framework for defining, detecting, assessing and responding to changes in the ecological values that the Network seeks to safeguard. The proposals in this document should help with this, and in doing so they will *inter alia* also assist the Standing Committee in its examination of cases of threats to sites that are brought to its attention, reduce the need for opening case files when more targeted responses can be used instead, and ultimately strengthen the contribution being made by the Convention to other international aims such as Aichi Biodiversity Target 11, which seeks the effective conservation of areas of importance for biodiversity worldwide.

1. BACKGROUND AND INTRODUCTION

1.1 The Bern Convention requires the Contracting Parties to take measures for the "conservation of habitats" and "protection of areas" (Article 4), and through decisions of the Convention's Standing Committee, the Emerald Network of Areas of Special Conservation Interest (ASCIs) has been created as a primary mechanism for stimulating and coordinating such efforts.

1.2 Extensive guidance has been adopted on the establishment and implementation of the Emerald Network. This has concentrated on the criteria for site selection, evaluation of the sufficiency of the Network, and site protection through the application of legal safeguards and proactive habitat management.

1.3 Standing Committee decisions have at the same time expressed expectations concerning the steps to be taken in response to influences which may from time to time have a potentially adverse effect on the values represented by a designated site, or in other words a more *reactive* mode of protection. Pre-requisites for effective implementation of this would include a clear understanding about the baseline state against which to judge change or the risk of change; monitoring to detect change or potential change, judgements about the significance of change, and options for adaptive responses (e.g. mitigation or habitat compensation).

1.4 To date, the Parties have not adopted guidance on these "reactive" matters. The "case file" system is a tried and tested mechanism for responding to serious problems facing sites, but it is triggered in a largely *ad hoc* manner rather than from a basis of systematic monitoring, and the principles and practices which guide it are framed in terms of procedures rather than ecological aspects.

1.5 The "ecological character" of a site is now proposed as a basis for addressing this gap. The term appears in Bern Convention Resolution No. 5 (1998), which refers to Parties informing the Secretariat about "changes likely to affect negatively in a substantial way the ecological character" of the designated sites in the Emerald Network. The term has however not previously been defined or interpreted in the Bern Convention context, nor does it feature to any extent in adopted guidance. It is conceived here as an expression of the values at stake at a given site and the suite of parameters among which any change or potential change would be detected, assessed and addressed as appropriate.

1.6 Given the advances made in recent times to expand the Emerald Network towards full completion, yet the constant levels of challenge to its objectives that are posed by pressures of land use change and developments of various kinds, there is a greater need than ever for the Bern Convention and its Parties to be equipped with an effective framework for defining, detecting, assessing and responding to changes in the ecological values that the Network seeks to safeguard. This will *inter alia* strengthen the contribution being made by the Convention to Aichi Target 11 in the Strategic Plan for Biodiversity 2011-2020, which seeks the effective conservation of areas of importance for biodiversity worldwide. As well as supporting the individual Parties in this, the suggested approach will also assist the Standing Committee in its examination of cases of threats to sites that are brought to its attention.

1.7 An initial review of these issues was discussed by the Group of Experts on Protected Areas and Ecological Networks at its 8th meeting in September 2017, and then presented to the Standing Committee at its 37th meeting in December 2017[1]. The review made reference to related regimes in other international fora, and concluded by recommending the development of guidance on describing the ecological character of Emerald Network sites, and on detecting, reporting, assessing and responding to changes and likely changes in such character, as an aid to Parties for their implementation of the existing provisions referred to above. (No new requirements are involved). Nine potential components of such guidance were identified. The report also proposed an examination of relevant Bern Convention case files for any good practice points revealed from case experience.

1.8 The Committee's discussion concluded as follows: "The Standing Committee took note of the gap in guidance revealed in the report and mandated the Secretariat, subject to the availability of resources, to develop appropriate guidance describing the ecological character of Emerald Network sites and to review the Bern Convention case files that relate to the change of ecological character of Emerald Network sites with a view to identifying the successful responses and defining good practices for detecting, reporting, assessing and responding to changes". The present document responds to this mandate.

2. ECOLOGICAL CHARACTER AND THE CONSERVATION OBJECTIVE FOR EMERALD NETWORK SITES

Guideline 1: Based on existing Bern Convention provisions for the Emerald Network, the conservation objective for each site can be stated as the *maintenance of the site's ecological character*, to be achieved through research, description, delineation, protection, management and

[1] Bern Convention (2017). The concept of the "ecological character" of sites in the Bern Convention/Emerald Network context, and options for addressing changes in ecological character. Document T-PVS/PA (2017) 8 prepared for the 8th meeting of the Group of Experts on Protected Areas and Ecological Networks, Belgrade, September 2017; and presented to the 37th meeting of the Standing Committee, Strasbourg, December 2017.

monitoring. The specifics of what this involves must be explicitly defined for each individual site. This objective contributes in turn to the objective of maintaining a favourable conservation status for the species and habitats that are collectively supported by the sites.

2.1 Article 4.1 of the Bern Convention provides that "Each Contracting Party shall take appropriate and necessary legislative and administrative measures to ensure the conservation of the habitats of the wild flora and fauna species, especially those specified in Appendices I and II, and the conservation of endangered natural habitats", and Article 4.2 provides that "Contracting Parties in their planning and development policies shall have regard to the conservation requirements of the areas protected under the preceding paragraph, so as to avoid or minimise as far as possible any deterioration of such areas".

2.2 In relation to sites in the Emerald Network, Standing Committee Recommendation No. 16 (1989) asks States to ensure wherever possible that (*inter alia*):

- regime designed to conserve the factors that are the basis for their inclusion in the Network; the sites are subject to an appropriate
- 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.

2.3 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.

2.4 Resolution No. 5 (1998) asks the governments "to inform the Secretariat of any important changes likely to affect negatively in a substantial way the ecological character of the designated ASCIs or the conditions having justified their designation. Where any such changes come to light, the Standing Committee may advise the government concerned on steps to be taken".

2.5 Recommendation No. 157 (2011) further recommends that Contracting Parties:

- take the necessary protection and conservation measures in order to maintain the ecological characteristics of the candidate Emerald sites; and
- ensure that, if and when appropriate, these measures include administrative, management or development plans corresponding to the ecological requirements for the long term survival of species and habitats present in the proposed Emerald sites, in particular those of the Bern Convention Resolutions No. 4 (1996) and No. 6 (1998) or specified by Recommendation No. 16 (1989).

2.6 Some of the implications that arise from these expectations include the need to:

- clearly delineate the boundaries of the area of interest in each case;
- understand what are the "critical elements" in the status of a given site, for the purposes of management and monitoring;
- understand what are the "important features" of a given site, for the purpose of making landowners and relevant authorities aware of these;

- define the "ecological character" (Resolution No. 5 (1998)) or "ecological characteristics" (Recommendation No. 157 (2011)) of a given site, as a basis for its conservation;
- know what is required to "conserve the factors that are the basis for the inclusion" of a given site in the Network;
- know what protection and conservation measures are required to "maintain the ecological characteristics" of a given site;
- understand what are the "ecological requirements for the long term survival" of the species and habitats present in a given site;
- know which activities or changes could adversely affect a given site, and how to prevent them doing so;
- be able to set appropriate management objectives; and
- be able to set appropriate parameters for monitoring.

2.7 Further elaboration of various conservation measures (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[2]. 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[3].

2.8 The 2014 guidance describes the setting of conservation objectives for Emerald sites in terms of the conservation measures required to maintain or increase populations of species or quality and area of habitats, so that each site can contribute as necessary to the maintenance of the favourable conservation status of the species or habitats concerned.

2.9 Favourable conservation status is judged at the population, national, biogeographical or regional level. Judging the contribution made to it by any one site is not straightforward, since this will be contingent to some extent on what happens at other sites. As a pragmatic proxy for this, therefore, reliance tends to be placed on a presumption that the values identified for a site at the time of its inclusion in the Network (in the terms of Resolution No. 5 (1998), the "ecological character of the designated ASCIs or the conditions having justified their designation") should be maintained in the state described for them at that time.

3. DESCRIBING ECOLOGICAL CHARACTER

> **Guideline 2**: *The "ecological character" of an Emerald Network site* is defined as the particular combination of ecosystem components, processes and other ecological features or characteristics that contribute to the quality and functioning of the site. This is more than a statement of the reasons why the site qualifies for inclusion in the Network - the emphasis here is instead on specifying the full mix of ingredients on which the site's integrity depends.

3.1 Despite the fundamental importance of the ecological character concept and the central reference to it in Resolution No. 5 (1998), it has not previously been defined or interpreted in the Bern Convention context, nor has it featured to any extent in the various guidance documents on the operation of the Emerald Network that have been produced over the years.

3.2 An analogous definition (and associated guidance) does however exist in the framework of the Ramsar Convention on Wetlands. Maintenance of the ecological character (of wetlands) is the core conservation objective in Ramsar, both in terms of designated Ramsar Sites (under

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[2] Bern Convention (2014). Towards management of Emerald sites. Document T-PVS/PA (2014) 8 prepared for the meeting of the Group of Experts on Protected Areas and Ecological Networks, Strasbourg, September 2014.

[3] Bern Convention (2015). 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.

Article 3.2 of the Convention Parties must detect and respond to change or likely change in the ecological character of their listed sites) and in terms of wetlands in general, whether designated or not (under Article 3.1 Parties must as far as possible promote the wise use of all wetlands in their territory, and "wise use of wetlands" has been defined as "maintenance of their ecological character"[4]).

3.3 The concepts employed in Ramsar on this (see also further below) have been taken into account in formulating the present document, to ensure compatibility as far as possible between the two Conventions' respective approaches. The Parties to Ramsar have defined ecological character (of wetlands) as "the combination of the ecosystem components, processes and benefits/services that characterise the wetland at a given point in time"[5]. "Ecosystem benefits" in this context are interpreted in accordance with the Millennium Ecosystem Assessment's definition of "ecosystem services" as "the benefits that people receive from ecosystems".

3.4 The "ecosystem benefits/services" part of the Ramsar definition has not at this stage been reflected in the one proposed here for Bern, since this is not yet a strongly developed element in the Emerald Network system, and Parties may wish to elaborate more of a foundation for it in the Emerald context (for example in terms of the data documented for sites) before it can be included in such a way.

3.5 The main systematic basis at present for identifying the values represented by Emerald Network sites lies with the process for selecting Areas of Special Conservation Interest (ASCIs) which (following further steps) can then become designated for the Network.

3.6 The criteria which determine the eligibility of a site to be regarded as "of special conservation interest" are set out in Recommendation No. 16 (1989) adopted by the Bern Convention Standing Committee for the purpose of identifying ASCIs for the Emerald Network in countries other than EU Member States. (In the latter, this is taken care of by the compatible process for identifying Special Protection Areas and Special Areas of Conservation for the Natura 2000 network under the EU Directives on Birds and Habitats).

3.7 According to Recommendation No. 16 (1989), 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
- represents an important area for one or more migratory species; or
- otherwise contributes substantially to the achievement of the objectives of the Convention.

3.8 The references to "threatened species" and "endangered habitat types" in this context are interpreted in accordance with lists compiled by the Standing Committee (habitats in Resolution No. 4 (1996) and species in Resolution No. 6 (1998)), and as further revised (species in 2011 and habitats in 2014) to harmonise with changes in the Annexes of the EU Directives.

3.9 The conservation objective for Emerald sites needs to be more than simply maintaining the conditions that justified the site's designation. This is because the reasons why the site meets the criteria are only a statement of the minimum qualifying threshold(s) it has satisfied;

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[4] Ramsar Convention (2005). A Conceptual Framework for the wise use of wetlands and the maintenance of their ecological character. Resolution IX.1 Annex A, adopted by the 9th meeting of the Conference of the Contracting Parties, Kampala, Uganda, 8-15 November 2005.

[5] Ramsar Convention (2005). *Op cit*.

whereas a statement of the conservation/management objectives for it (and the baseline against which to evaluate change) will usually need to define more than this minimum qualifying state. To do otherwise would be to allow sites of more than merely qualifying value to decline to the minimum. Moreover in some circumstances (e.g. if reference animal populations reduced as a result) this could lead to repeated redefinitions of the relevant qualifying threshold(s), such that qualification could be maintained with successively smaller and smaller numbers, until the perverse but logical outcome is reached whereby the population becomes extinct.

3.10 The additional information that is documented for each selected site in a Standard Data Form is therefore also relevant to a description of the site's ecological character. The template for the ASCI Standard Data Form is adapted from the equivalent for Natura 2000, and is provided in an annex to Bern Resolution No. 5 (1998) (the version updated in 2013).

Guideline 3: The *description of the ecological character of a given Emerald site* can be compiled from the information that is already recorded in the following data fields of the site's Standard Data Form (SDF):

- Site area (or length, for linear sites).
- The "Resolution 4" habitat types present on the site; the area of each of them; and the % cover of each habitat class.
- Representativity (of each habitat type).
- The "Resolution 6" plant and animal species present on the site; whether each is "permanent", "reproducing", a "concentration" or "wintering"; and the numbers or abundance category for each.
- Other important species of flora and fauna, with the numbers or abundance category for each.
- "Other site characteristics" - a free-text field in the SDF. For ecological character description purposes this should include, *inter alia*, the key ecological *processes* that are relevant (these are not covered elsewhere in the SDF); any other ecological features or characteristics that contribute to the quality and functioning of the site; some information on the site's position in the landscape, including its altitude (which is not covered elsewhere in the SDF); and any key relationships to adjacent or nearby ecosystems.
- "Quality and importance" - a free-text field in the SDF. For ecological character description purposes this should include, *inter alia*, some information (if known) on the conservation status trend (e.g. improving/deteriorating/stable) for the key habitats, species and other ecological quality parameters that are recorded. (The SDF asks elsewhere about threats & pressures, but not about the resulting effects of these).
  This field should also be used to give an overall summary statement (consisting of two or three narrative sentences) expressing what is ecologically distinctive (not necessarily most important) about the site. The statement could also usefully identify which of the ecological components and processes described in the other fields above are considered *critical* to determining the ecological character of the site.

3.11 The suggested approach to describing a site's ecological character in Guideline 3 above should be regarded as an essential minimum, and any of the elements listed could potentially be addressed in a much more comprehensive way where information and capacity allows. The Ramsar Convention's approach for example by comparison uses a datasheet in which there are

23 data fields for the "ecological components", 9 data fields for the "ecological processes" and 27 data fields for the "ecosystem services"[6]. Within some of those data fields there are checklists of further subdivided items, and links to explanatory notes.

3.12 For any Emerald site which is a wetland, it will be helpful to consider the data fields defined in the Ramsar guidance as potential extra elements in the description of the site's ecological character. If the Emerald site is also designated as a Ramsar Site, then relevant information should already have been documented in that context, and all that would need adding in such a case would be the Bern Convention specifics (e.g. Bern priority habitats and species, European population and biogeographical contexts, etc.). In the case of partially overlapping designations, a hybrid approach would be taken.

3.13 Thinking and experience on ecological character continues to evolve in relation to additional aspects of the concept, and these description frameworks might conceivably be developed further in future to address such issues as the genetic and trophic structure of ecosystems.

3.14 Crucial to the approach is the part of the definition which refers to the *combination* of the ecosystem components and processes etc. involved, in other words a holistic idea of what they represent in total, and how this might characterise a site in such a way as to distinguish it ecologically from other sites. Hence the element in the description offered in Guideline 3 above which refers to the "summary statement", including potentially an identification of any elements considered "critical" to the whole. Both of these ideas are also found in the Ramsar regime[7].

3.15 The "holistic" aspects are relevant also to notions of site "integrity" as an attribute to protect. Site integrity has not been specifically defined in Bern or Ramsar contexts, but it features in the obligations applying to Natura 2000 sites under Article 6 of the EU Habitats Directive[8], and in the guidance for evaluating site nominations under the World Heritage Convention[9].

> **Guideline 4**: Site conditions found at the moment of description may not necessarily be typical of its ecological character over time, given that natural cycles or trends may be involved. A description limited in this way could be the wrong baseline against which to assess change.

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[6] The 10th meeting of the Ramsar Conference of Parties (COP10) adopted an "Ecological Character Description Sheet" together with guidance on its use – see *Ramsar Convention (2008a). Describing the ecological character of wetlands, and data needs and formats for core inventory: harmonized scientific and technical guidance. Resolution X.15 adopted by the 10th meeting of the Conference of Contracting Parties, Changwon, Republic of Korea, 28 October-4 November 2008*. Most Parties in fact however now record relevant details in the subsequently revised version of the Ramsar Information Sheet (RIS) which is compiled for each site by the Party concerned and is incorporated in the global Ramsar Sites database – see *Ramsar Convention (2012a). Streamlining procedures for describing Ramsar Sites at the time of designation and subsequent updates. Resolution XI.8 adopted by the 12 meeting of the Conference of Contracting Parties, Bucharest, Romania, 6-13 July 2012*. (The revised Ramsar Information Sheet is at Annex 1, and guidance on it is in the "Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance of the Convention on Wetlands - 2012 revision" at Annex 2 - see section 7.3.1 of the latter for further information on the section on ecological character).

[7] The parallels with the Ramsar regime are discussed in more detail in Bern Convention (2017) *op cit*.

[8] European Commission (2002). Assessment of plans and projects significantly affecting Natura 2000 sites: methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Under Article 6.3 of the Directive, in situations concerning certain plans or projects, "the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned". The methodological guidance describes integrity in terms of ecological functions that are relevant to the site's conservation objectives, and the document includes a checklist of factors to consider in judging potential adverse effects on integrity.

[9] UNESCO (2017). Operational Guidelines for the implementation of the World Heritage Convention. Intergovernmental Committee for the Protection of the World Cultural and Natural Heritage, document WHC.17/01, July 2017. Where sites qualify for World Heritage designation according to the criteria of "outstanding universal value", such sites must also demonstrate "integrity", which in the case of sites in the "natural" category means that they should *inter alia* be "of adequate size to ensure the complete representation of the features and processes which convey the property's significance", their "bio-physical processes and landform features should be relatively intact" and (in relevant cases) "the necessary elements to demonstrate the key aspects of processes that are essential for the long term conservation of the ecosystems and the biological diversity they contain" should be included.

Ecological character descriptions should therefore incorporate information on known *natural variability*, referring to sufficiently long historical timeframes where data are available.

3.16 Identifying the correct reference condition to use as the basis for a description of ecological character can be a challenge, given that many ecosystems are subject to long-term natural variation. When a site qualifies for designation, the evidence confirming that fact is naturally assumed to be depicting a desirable state. It is understandable that this may then come to be assumed also to be a depiction of the *most* desirable state or a *target* state, and hence to be the benchmark for deciding when there has been undesirable change. This second assumption however may often be flawed.

3.17 A single assessment at the time of designation, or at the moment when a data form is completed, may simply provide a static "snapshot" of the conditions and characteristics of a site at a more or less arbitrary point in time. It risks presenting a characterisation that may not be representative of the site's true nature, if underlying conditions fluctuate from time to time or if they are evolving in a particular direction. Such a characterisation may therefore not be the most valid baseline against which to evaluate future change. "Maintaining the ecological character" of the site could be an overly static concept if it is applied without factoring in these realities; yet care is needed in the approach to this, because it is also necessary to have robust (and clear) expressions of value with which to defend designated sites against development threats and other unwanted change.

3.18 Information on any known natural variability, referring to sufficiently long historical timeframes where data are available, should therefore be incorporated as far as possible in all relevant fields of the ecological character description. This might include multi-annual cycles in the site's environmental context (e.g. rainfall, temperature), or directional trends in e.g. geomorphology, evolution, succession or diversification. The "combination of ecosystem components and processes" could be considered to include processes of long-term cyclical change, homeostatic responses to perturbation (i.e. resilience), and adaptation to natural change through switching from one stable state to a different stable state. Distinguishing natural variability from human-induced change is of course not always easy, but should be based on the best available science.

Conceptual models

Guideline 5: A *conceptual model* is a simple diagram or pictorial representation of a site that offers a useful way of condensing information about its ecological character into an easily-grasped summary. This can help with a variety of communication and management needs. Good examples, guidance materials and tools for constructing such models (based primarily on wetland ecosystems, but adaptable to others) are freely available on-line.

3.19 The state of understanding about the ecological character of a site can often be usefully summarised in a simple diagrammatic or pictorial representation known as a "conceptual model". This portrays ideas about the most important components of the site and the relationships between them, in an integrated "system view".

3.20 Conceptual models may be familiar in a project management context where they may take the form of a kind of flow-chart depicting the project's "theory of change" or "results chain", showing how inputs, activities, drivers, constraints, outputs and outcomes all relate. Modelling a designated site is similar; but in this case the aim is to show the site's key component parts and how they function as an ecosystem. It also moves beyond generic models of habitat types and ecological processes, since a conceptual model of a site's ecological character is specific to the unique combination of factors exhibited by the individual site concerned.

3.21 Such models have proved to be powerful communication and planning tools, because they offer a way of condensing a lot of complex information into a visually graspable summary that can be used by audiences with varying levels of knowledge. This can relate either to the biophysical aspects of the site, or its management regime, or both. For Emerald Network sites this is an idea that countries may wish to consider on a voluntary basis.

3.22 As a tool for defining values and baselines, a conceptual model helps to give an overview of the ecological character of the site as a whole, and helps to express the way in which its most important components, processes and other ecological features or characteristics combine together to produce the character.

3.23 As a planning tool, a conceptual model's synthesis of the ecological character description of the site provides a convenient focus for organising attention to relevant risks, for prioritising and directing any necessary management interventions, and for defining relevant indicators for monitoring and reporting. As well as portraying the normal or present-day functioning of a site, a conceptual model may also help in modelling processes of change (see section 4 below) and potential future scenarios, including for example the desired states that may be required (e.g. in a context of restoration programmes) to secure the favourable conservation status of particular species or habitats.

3.24 Compiling a conceptual model could involve new field information and numerical modelling, with data for example on hydrology or biological productivity, and perhaps involving stakeholder input. It could however, equally validly, be a very simple and rapid desk-top exercise by an expert who is familiar with the site.

3.25 A single all-encompassing model for a very complex site may be difficult to construct or to use: in such cases it may be preferable to develop two or more connected models, each with a focus on a different dimension of the site's ecological character.

3.26 Perhaps the most developed system for producing conceptual models of site-based ecological character is that used by the government authorities in Australia, as part of the ecological character descriptions they compile for their designated Ramsar Sites[10]. A comprehensive associated document on constructing these models (for wetlands, but readily adaptable to other situations) probably provides the best current guidance on practical approaches to follow[11].

[10] The individual ECD documents can be consulted at the website of the Department of the Environment and Energy - http://www.environment.gov.au/water/wetlands/publications#mgmt-plans .

[11] Department of Environment and Heritage Protection (2012). Pictures worth a thousand words: a guide to pictorial conceptual modelling. Queensland Wetlands Program, Queensland Government, Brisbane. Available to download at https://wetlandinfo.ehp.qld.gov.au/wetlands/resources/pictorial-conceptual-models.html .

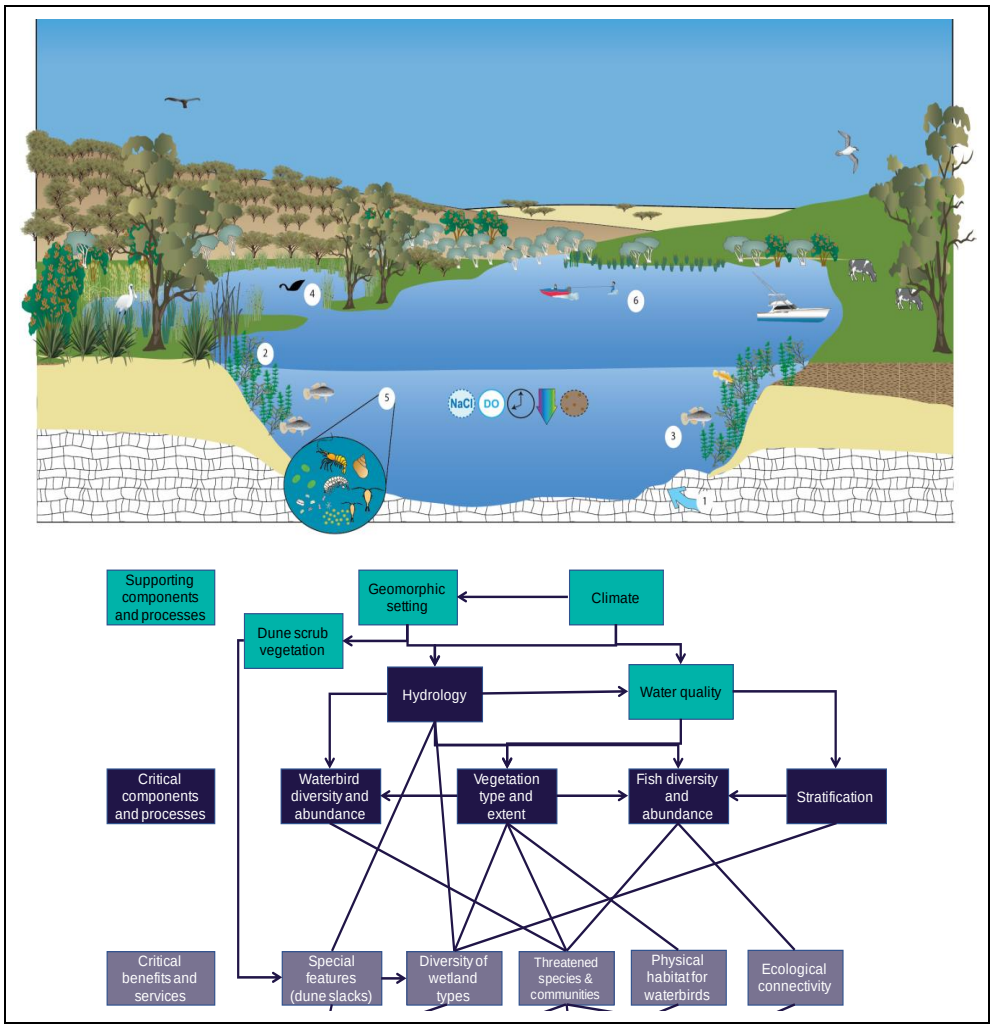


Figure 1: Example of a conceptual model for the ecological character of a wetland site. (Methods vary considerably, and this is just one illustrative example of a way in which it might be done).

Source: Department of Environment, Land, Water and Planning (2017). Ecological Character Description for Glenelg Estuary & Discovery Bay Ramsar Site. Department of Environment, Land, Water and Planning, East Melbourne, Victoria, Australia. © State of Victoria Department of Environment, Land, Water and Planning: licensed under Creative Commons International licence http://creativecommons.org/licenses/by/4.0/ . Symbols and graphics courtesy of the Integration and Application Network, University of Maryland Center for Environmental Science (ian.umces.edu/symbols/).

3.27 Many conceptual models use symbols and icons to encapsulate the main features and attributes being represented. An open-source library of these has been developed by the University of Maryland for purposes of this kind, and it provides a valuable resource for anyone constructing such models[12].

4. DEFINING CHANGE IN ECOLOGICAL CHARACTER

Guideline 6: For the purposes of Bern Convention Resolution No. 5 (1998), *change in the ecological character of an Emerald Network site* is defined as the actual or potential negative alteration of any ecosystem component, process or other ecological feature or characteristic that may substantially affect the quality or functioning of the site.

[12] The contents of the library are available to download, free of charge, from the website of the University of Maryland's Center for Environmental Science Integration and Application Network - http://ian.umces.edu/symbols/ . The library contains over 1,500 custom made vector symbols, over 100 custom swatches, ecosystem landscapes and an interactive multimedia tutorial, all designed to enhance diagrammatic representations of complex scientific issues.

4.1 As explained in section 2 above, under Bern Recommendation No. 16 (1989), Parties are asked to conserve the factors that are the basis for each Emerald site's inclusion in the Network, and under Recommendation No. 157 (2011) they are recommended to take the necessary measures to maintain the ecological characteristics of the sites. Any change or likely change in the qualifying factors might be relevant for the purposes of Recommendation No. 16 (1989), and any change in the "ecological characteristics" might be relevant for the purposes of Recommendation No. 157 (2011). (The term "characteristics" is not defined, but in the context of Guideline 3 above it is probably best regarded as a sub-set of the ecological character, rather than being synonymous with it).

4.2 More specifically however, in order to implement Bern Resolution No. 5 (1998), governments need ways of knowing when they are facing instances of "change likely to affect negatively in a substantial way the ecological character of a designated ASCI". For the purposes of Resolution No. 5 (1998) therefore it is only "negative" and "substantial" instances that are relevant; hence Guideline 6 above is framed in those terms. Note however that it is the *effect* that needs to be substantial, not the change in the ecological component etc. that triggers it (a small change in a key component may have a large effect on the quality or functioning of the site).

4.3 In addition to having a description of the ecological character of a site, therefore, there needs to be some understanding of what the particular vulnerabilities of the site are, and which kinds of influences or activities could potentially pose a threat of change to its character.

4.4 Although ecological character has a holistic dimension as discussed earlier above, discerning change ought not to depend necessarily on deciding that there has been or is likely to be a loss of the site's overall integrity. It should normally be assumed that this is part of the story; but the "trigger" for reporting under Resolution No. 5 (1998) need only concern change or likely change in any one of the ecosystem components, processes, features or characteristics identified in the site's ecological character description.

4.5 The definition of change in ecological character (of wetlands) in the Ramsar Convention context is, as with the Bern Convention, also explicitly related to a specific requirement for the Parties to notify changes, in that case under Article 3.2 of the Convention (the Article relates specifically to Ramsar Sites). The definition reads: "for the purposes of implementation of Article 3.2, change in ecological character is the human-induced adverse alteration of any ecosystem component, process, and/or ecosystem benefit/service"[13].

4.6 The Ramsar definition specifies "human induced" because the scope of Article 3.2 is limited to changes resulting from "technological developments, pollution or other human interference"[14]. It does not distinguish between direct and indirect causes[15].

4.7 The World Heritage Convention's "List of World Heritage in Danger" is compiled according to criteria for "ascertained" and "potential" dangers, with examples listed including decline in species populations, encroachment by development and "threatening impacts of climatic, geological or other environmental factors". In the case of natural properties however the guidelines state that "most threats will be human-made and only very rarely will a natural factor (such as an epidemic disease) threaten the integrity of the property"[16].

4.8 Bern Convention texts do not suggest a "human induced" limitation like the one found in Ramsar, and so in theory natural changes should be notified under Resolution No. 5 (1998) in the same way as anthropogenic ones: but the realism about this advised in the World Heritage context is worth heeding nonetheless.

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[13] Ramsar Convention (2005). *Op cit*.

[14] Various aspects of this regime are discussed in more detail in the several sources cited in Bern Convention (2017) *op cit.*

[15] Whether or not climate change is covered by this has been cause for debate, with the general (but not fully settled) view being that climate issues are better addressed through other mechanisms of the Convention.

[16] UNESCO (2017). *Op cit*.

4.9 The Ramsar definition specifies "adverse" alterations because the context of Article 3.2 relates to the triggering of corrective responses. The World Heritage guidelines also indicate that the threats identified in the context of the Danger List must be "amenable to correction by human action". The Bern Resolution No. 5 (1998) also specifies negative effects, and implies that changes notified in accordance with the Resolution should be amenable to corrective action, given its provision that "Where any such changes come to light, the Standing Committee may advise the government concerned on steps to be taken".

> **Guideline 7**: Judging whether a change is *likely to have a "substantial" effect* on a site's ecological character will depend on the particular circumstances of the individual site. Significance may be judged in terms of absolute magnitude, departure from a baseline norm, defined variability limits or other methods. Given the predictive nature of the question, expert opinion will usually play a part, and a precautionary approach should be taken (i.e. "if in doubt, report").

4.10 In the Ramsar example mentioned above, the Convention requirement is unqualified as to the magnitude or significance of the changes in ecological character to which it refers. It implies that any change or likely change, no matter how trivial, should be reported. Clearly to do so would be neither practical nor helpful, but the Convention has never spelled out a way of deciding how big a change is a "real change" for this purpose, nor how to take account of naturally fluctuating baseline states.

4.11 The Bern Convention Resolution No. 5 (1998) is more qualified in this regard, in that it refers to "important" changes likely to have "substantial" effects on the ecological character of a site. (It also has a different focus of attention, being based more on reporting the *cause* of an ecological character change than just reporting the actual or potential *result* of such a change). The World Heritage Convention's criteria for World Heritage in Danger are also more qualified, with terms such as "major", "serious decline", "severe deterioration", "threatening integrity" and "deleterious effects on inherent characteristics".

4.12 The question remains as to how to decide that a change (in the Bern Convention's case) is "important" and its effects likely to be "substantial". Judgements on this will be dependent on the particular circumstances of the individual site. Relevant guidance on approaches to this issue has been published by the European Commission in relation to the analogous question which arises under Article 6 of the Habitats Directive[17], and guidance on screening for environmental impact assessment will also often be relevant[18]. Methods can include checklists and matrices, but will often more simply and pragmatically involve the use of expert opinion.

4.13 Significance of a change or likely change may be judged in several ways, for example in terms of its absolute magnitude, in terms of departures from a defined baseline norm, by reference to specific vulnerabilities defined for a site, by reference to a defined bandwidth of "acceptable" variation, or combinations of these.

4.14 Recognising significant departures from a baseline norm will depend on appropriately defining the baseline (for example in terms of its temporal context), and will need to be alive to the possibility that the baseline itself is fluctuating or shifting, as discussed under Guideline 4 above.

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[17] European Commission (2002). *Op cit.*
The Commission has also produced a wealth of guidance on managing particular habitat types and on particular land- and resource-use sectors (see *http://ec.europa.eu/environment/nature/natura2000/management/guidance_en.htm*), and aspects of this may be useful in individual cases which involve any of the habitats or sectors concerned.

[18] See for example European Commission (2001). Guidance on Environmental Impact Assessment – screening. Document produced by Environmental Resources Management for EC DG Environment.

4.15 Change-detection then becomes an issue of distinguishing "signal" from "noise", i.e. discerning actual or potential perturbations which may become superimposed on the site's normal pattern and which may indicate an issue of concern. Not "fitting the pattern" may relate to changes in the frequency or other timing characteristics of the baseline variability, as well as changes in the quantities or sizes of the physical variables involved.

4.16 If change is affecting the site at the time when its ecological character is described, this should be incorporated into the baseline description of the site. If such change is continuing to cause or to threaten changes in any aspect of the ecological character of the site thereafter, it ought to be reported under Resolution No. 5 (1998), even if strictly speaking it is not a "change to the change" recorded in the baseline character description.

4.17 Judging significance by reference to a defined bandwidth of "acceptable" variation invokes the idea of defining what are sometimes referred to as "Limits of Acceptable Change" for a site. This term however arises from the different context of management planning, and is linked to the objective of staying true to site management objectives. It appears mainly in the context of visitor management in North America, where it has developed as a way of framing compromises and trade-offs (including on non-ecological parameters) and for undertaking iterative steps of adaptive management of these, rather than being a way of setting tolerance thresholds. For the latter purpose in the Ramsar context it has been suggested that the term "Limits for Defining Change in Ecological Character" should be used instead[19].

4.18 Such limits are not generic, but are specific to the circumstances of an individual site. Site management plans are an appropriate place for them to be defined. In a sense, limits can be regarded as limits of confidence. So, for example, when the values of all performance indicators for a site fall within the limits, it can be confidently considered that the site's ecological character is being maintained; when the limits are exceeded, that confidence disappears.

4.19 A sufficient safety margin in defining limits of this kind must always be allowed, to account for the possibility of unexpected changes, unforeseen impacts and misjudgements. Given the element of prediction and judgement involved in identifying changes that are "likely to affect" the ecological character of Emerald Network sites, in a more general sense it is important to take a precautionary approach (i.e. "if in doubt, report"); and approaches which draw on methods for risk assessment will often be appropriate (see Guideline 11 below).

5. MONITORING AND DETECTING CHANGE IN ECOLOGICAL CHARACTER

> **Guideline 8**: Countries should ensure that they have in place arrangements for monitoring or surveillance of all of their 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.

5.1 Existing provisions under the Bern Convention make some reference to monitoring of sites. For example Recommendation No. 16 (1989) recommends that Contracting Parties take steps to ensure wherever possible that research is conducted with a view *inter alia* to monitoring the status of the factors giving rise to the designation of ASCIs and their conservation.

5.2 Resolution No. 8 (2012) further provides *inter alia* that:

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[19] Ramsar Convention (2012b). Limits of Acceptable Change - the definition and operation of concepts and approaches for "limits of acceptable change" which may be applicable to the Ramsar context of defining and detecting change in the ecological character of wetlands. Document COP11 DOC. 24 tabled at the 11th meeting of the Conference of Contracting Parties, Bucharest, Romania, 6-13 July 2012.

- Parties will ensure that a monitoring framework forms an integral part of the management plans and/or other administrative measures taken for the designation of Emerald sites;
- Monitoring of site management will comprise regular surveillance of the implementation of the conservation regime and of the conservation status of the species, habitats and/or other factors giving rise to the designation of the area; and
- Regular surveillance of the conservation status of species and habitats for which a site has been designated will comprise appropriate scientific and ecological research, aiming at identifying whether the site contributes to the long term survival of the species and habitats.

5.3 It can be seen however that the provisions cited above focus mainly on monitoring the delivery of planned implementation activities and the resulting status of species and habitats, rather than covering vigilance for the unplanned, or unexpected, or external influences in a way that would satisfy Resolution No. 5 (1998).

5.4 Guideline 8 above addresses this by extending to all Emerald Network countries an action agreed already for those in the Central and Eastern Europe and the South Caucasus area (in the framework of the "Road Map" for implementing the Network in those countries which was adopted by the Bern Standing Committee in 2016[20]).

5.5 In texts such as these, the terms "monitoring" and "surveillance" have at times been used more or less interchangeably. There is a difference, however[21]. Strictly speaking, monitoring is a process of making one or more observations to establish whether or not real evidence supports a theoretical hypothesis, or to confirm whether or not an objective is being achieved. In an Emerald Network context for example it would be used to assess the effectiveness of site management. (One of the site management objectives is likely to be the maintenance of the ecological character of the site; and so monitoring might address this; but it is more often likely to be *measuring the resulting status of species and habitats* than *detecting instances of change or likely change*).

5.6 For the latter purpose, "surveillance" is probably the more appropriate concept. Surveillance may be regarded as on-going vigilance that is arranged so as to be able to detect relevant *events* and *trends*[22]. This would be capable of picking up unplanned and unexpected negative changes in factors affecting or likely to affect a site's ecological character, while monitoring against management objectives might not. Many techniques are available for this, and countries should select the approach that is most appropriate to their circumstances, provided the ability to implement Bern Resolution No. 5 (1998) is assured.

5.7 Guidelines 9 and 10 below reflect this distinction, effectively translating the concepts in Resolution No. 8 (2012) to the expectations that already existed in Resolution No. 5 (1998). In a more general sense however it may be convenient to regard "monitoring" as the overall requirement that embraces both approaches; and hence the references here to "a system of monitoring" should be interpreted in this broader way.

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[20] Bern Convention (2016). 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.

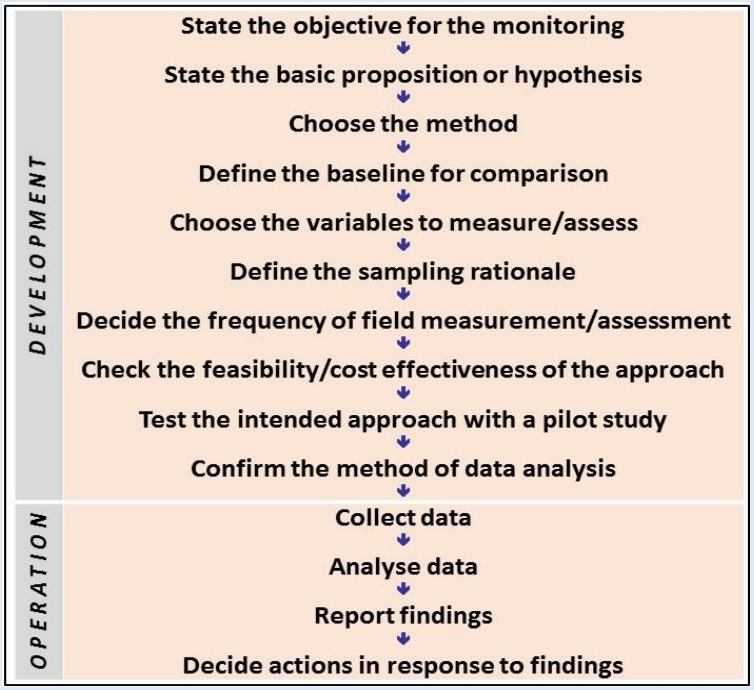
[21] See comments on this for example in Williams, J M (Ed) (2006). Common Standards Monitoring for Designated Sites: first six year report. JNCC, Peterborough, UK. - and Ramsar Convention (2002). Framework for wetland inventory. Resolution VIII.6 adopted by the 8th meeting of the Conference of the Contracting Parties, Valencia, Spain, 18-26 November 2002.

[22] This is not to be confused with the idea of "reactive monitoring" which is a term used for (subsequent) *investigations triggered by* an event or trend. In the World Heritage Convention context for example, advisory missions concerning sites included or proposed for inclusion in the list of World Heritage in Danger are termed Reactive Monitoring Missions. In the Ramsar Convention, the analogous procedure now referred to as Ramsar Advisory Missions was originally named the "Monitoring Procedure" on the same basis. In this sense, "reactive monitoring" in the Bern Convention context equates more closely to the case file system than to "monitoring" or "surveillance" as they are discussed here.

Guideline 9: Key elements in a system of monitoring to *assess the achievement of conservation objectives* for an Emerald Network site include:

- The conservation objectives for the site will be those defined in a management plan, or in the absence of a management plan there should at least be an agreed statement of conservation objectives.
- Some objectives may relate to the desired state of the entire site, and some may relate to individual elements of its ecological character as described in Guideline 3 above. The objectives will typically express a target state, and they may often describe the limits of acceptable variation around that target state.
- The monitoring itself should be programmed to occur at defined intervals, and in a comparable way across all of the sites that are under the jurisdiction of the relevant body (i.e. typically a national network).
- Methods might involve a structured walk across the site, or they could employ other tools such as aerial photography.
- Basic, low-cost monitoring is better than no monitoring at all, and it is always possible to undertake it to some degree.

Basic steps for developing and operating such a system in a given case will probably include the following:



Guideline 10: Key elements in a system of monitoring to include *detection of change or likely change* in the ecological character of an Emerald Network site include:

- Detecting *change* involves surveillance of the actual state of the site and its ecological character components; while detecting *likely change* involves surveillance of relevant influences and intentions that may either trigger or be the cause of impending change.
- The individual aspects to focus on and document in surveillance for *actual change* will be those already defined for the site in the

description of its ecological character, pursuant to Guideline 3 above (including any defined limits of acceptable variation in each of them). These are ecological rather than administrative factors.

- Methods for detecting actual change might involve field visits, or they could employ other tools such as remote observation technology.
- Surveillance of *influences and intentions* that could trigger or cause a change in the ecological character of a site may involve *both* ecological *and* administrative factors. Covering the latter is likely to include screening of planning and decision-making processes that may reveal a prospect or proposal of change, such as registers of consent applications for development proposals, decisions granting consents, etc.
- Information on both change and likely change can come from the day-to-day work of appointed site managers; but can just as validly be generated by local wardening, survey and recording schemes, and from the vigilance of NGOs, community conservation groups and wider civil society.
- Problems affecting or likely to affect a site may arise from outside its boundaries, sometimes at a considerable distance; so it is important for surveillance systems to encompass these.
- Basic, low-cost surveillance is better than no surveillance at all, and it is always possible to undertake it to some degree.

Basic steps for developing and operating such a system in a given case will probably include the following:

DEVELOPMENT	**Define the ecosystem components, processes or other ecological features or characteristics of the site in which a change or likely change (beyond any stated limits of acceptable variation) needs to be detected (this will effectively have been done already under Guideline 3 above).** ↓ **Identify in advance, where possible, those risks deemed likely to be relevant to the particular situation of the individual site (see Guideline 11 below).** ↓ **Define the sources of information and surveillance methods (including frequency) to be used. Define any early warning indicators to be used (see Guideline 12 below).** ↓ **Specify who will undertake the surveillance, and who will coordinate the process. Indicate how/by whom the information will be verified or validated. Train/induct the information providers.** ↓ **Define communication channels and protocols for passing information to the Bern Convention Secretariat.**
OPERATION	**Receive information on actual or likely change to a site** ↓ **Interpret information (and explain how causes of change have been identified, deduced or otherwise attributed)** ↓ **Communicate findings or alerts (to the Bern Secretariat, for the purposes of Resolution No. 5 of 1998)** ↓ **Decide actions in response to findings or alerts**

5.8 Guideline 9 above draws on other existing international site monitoring frameworks (notably for the Natura 2000 network in the European Union[23] and for wetlands under the Ramsar Convention[24]); and it should be easy to integrate it with those in situations where multiple designations overlap. The EU example contributes to assessments of "favourable condition" for Natura 2000 sites, and is composed from condition assessments (against specified objectives) for "key attributes" (e.g. extent, quality, supporting processes) of each of the special "features" (species, habitats and geological and geomorphological characteristics) by reason of which the sites are designated. A similar approach could therefore be applied to the individual ecosystem components, processes and other ecological features or characteristics making up the ecological character of an Emerald Network site.

5.9 Guideline 10 above draws on aspects of the Ramsar "Article 3.2" process referred to earlier. There are parallels also with aspects of the global framework developed by BirdLife International for monitoring Important Bird Areas (IBAs), which adopts a "pressure-state-response" model[25]. The "response" part of that includes monitoring conservation actions, which may be part of an ultimate feedback loop for the issues in any given case, but otherwise they fall outside the scope of monitoring ecological character change *per se*. The "state" part broadly equates to issues covered by Guideline 9 and by the Ramsar and UK Natura 2000 examples mentioned above.

5.10 The "pressure" part of the IBA scheme however is a closer match than these others to the dimension of "influences and intentions" defined in Guideline 10 above for implementing Resolution No. 5 (1998) for Emerald Network sites. BirdLife describes the definition of appropriate "pressure indicators" to identify and track the major threats to important bird populations at each IBA (linked to the site's conservation objectives), including such things as rates of agricultural expansion, over-exploitation and pollution. Threats are scored from 0 to -3 according to their timing (e.g. happening now, likely in the short term, likely in the long term), scope (e.g. all of the site, some of the site) and severity (e.g. rapid deterioration, slower deterioration), in terms of how likely these are to affect the defined "trigger" bird species at the site. Scores can then be aggregated, as a threat or pressure index for the site as a whole.

5.11 The system ingredients suggested in Guidelines 9 and 10 above are not intended as a prescriptive recipe for any particular programme. They simply provide a logical outline of elements to consider, and steps that can usefully be followed to design and operate a scheme that will be appropriate for Emerald Network purposes while fitting the particular circumstances of the country concerned. The framework represented by these two Guidelines is designed to be sufficiently simple, flexible and practical to be implemented across a range of different situations.

Guideline 11: For each site, the main *risks deemed likely* to cause "negative alteration of any ecosystem component, process or other ecological feature or characteristic that may substantially affect the quality or functioning of the site" should where possible be identified in advance. The scope of monitoring under Guideline 10 above can then, where appropriate, be cost-effectively tailored accordingly.

For each identified risk or category of risk, it is useful to make an assessment of:

- The *nature* of the risk and the nature of the alteration(s) it may cause;

[23] Williams (2006). *Op cit.*

[24] Ramsar Convention (2006). Framework for designing a wetland monitoring programme. Annex to Resolution VI.1: *Working definitions of ecological character, guidelines for describing and maintaining the ecological character of listed sites, and guidelines for operation of the Montreux Record*, adopted by the 6th meeting of the Conference of the Contracting Parties, Brisbane, Australia, 19-27 March 1996.

[25] BirdLife International (2008). Monitoring Important Bird Areas - a global framework. Version 1.2, Cambridge.

- The expected *extent* and *severity* of the effects that would result if the risk were realised (taking a precautionary approach where there is any uncertainty);
- The relative *likelihood* that the risk will be realised (taking a precautionary approach where there is any uncertainty);
- The options available for *reducing the likelihood* of the risk being realised, or for *mitigating the consequences* if it is realised.

Simple scoring systems (e.g. 1-5) can be used for assessing each of these questions, and protocols agreed for defining how the results will shape priority-setting in the surveillance regime.

5.12 The priority areas of focus for a monitoring regime that covers the elements described in Guideline 10 can usefully be narrowed down by undertaking a form of simple *risk assessment* for each Emerald Network site. This needs only be a guide and not a straitjacket, but it serves to sensitise all those who may be contributing to relevant vigilance to know what particular potential problems to anticipate and look out for. At a more sophisticated level, risks can be analysed quantitatively, providing a useful management tool for prioritising effort and allocating resources. The Ramsar Convention has adopted a "Risk Assessment Framework" which shows one way in which this may be approached in a wetland context[26].

Guideline 12: The ability to detect change or likely change in the ecological character of a site can be cost-effectively enhanced by using *early warning indicators* as part of a monitoring & surveillance regime. These are factors giving measurable signals which may precede the occurrence of potentially significant effects, and which therefore provide an opportunity to determine whether intervention or further investigation is warranted.

Responses to environmental stress have the potential to be good early warning indicators if they are, *inter alia*:

- Anticipatory – giving a signal well in advance of actual serious harm occurring;
- Sensitive – reacting to low levels or early stages of a potential problem;
- Context-relevant – appropriate for the region, ecological conditions and conservation priorities etc. involved, and related to the risks identified in accordance with Guideline 11 above;
- Diagnostically specific – allowing confidence in relating cause to effect;
- Easy to measure – using a standard procedure with high reliability and low scope for error;
- Rapid and cost-effective to interpret and use – giving a signal that can be received and interpreted inexpensively, and in good time to respond.

5.13 Guideline 12 above defines some key features of *early warning indicators* and the role they might play in making monitoring and surveillance of Emerald Network sites more effective[27]. In principle, the more that problems or potential problems relating to the ecological character of sites can be detected at the first indication of a change occurring, the more rapidly can

[26] Ramsar Convention (1999a). Wetland Risk Assessment Framework. Resolution VII.10 adopted by the 7th meeting of the Conference of Contracting Parties, San José, Costa Rica, 10-18 May 1999.

[27] This Guideline draws partly on an adaptation of selected elements from the Ramsar Convention's guidance on early warning indicators, contained in Ramsar Convention (1999a). *Op cit.*

immediate low-cost remediation responses be initiated, and the less frequent will be the need for cases to be escalated into processes of formal complaints, investigations, judicial proceedings or other international mechanisms.

5.14 Early warning indicators can be very sensitive at the level of biomarkers (such as chemical contaminants) in individual organisms; but relevance to impacts at population or ecosystem level tends to decrease as this kind of sensitivity (and measurability) increases. There is usually therefore a trade-off between very early detection ability and ecological relevance.

5.15 Assessing potential effects/implications at ecosystem level often relies on monitoring particularly indicative "surrogates" such as "keystone" species, or population variables that are closely linked to known environmental stressors.

5.16 As with all indicator regimes, it is important to be explicit about the assumptions and limitations that are being acknowledged, including an understanding about the risks (and costs) of inferring that there is an impact when in fact there is none, and conversely the risks (and costs) of failing to detect an impact when in fact there is one.

5.17 Guideline 7 above refers to the need to take a precautionary approach to determining the potential significance of changes, and Guideline 11 highlights the same issue in relation to assessment of risks. Bern Resolution No. 5 (1998) is inherently anticipatory in covering not only those ecological character changes that have happened or are happening, but also those deemed "likely" to happen. It is not easy to specify in a general way what degree of "likelihood" or confidence is sufficient to require the triggering of a report, and given the uncertainty often involved in such predictive judgements, the basic principle is to err on the side of caution and if in doubt, to report.

5.18 In principle, plan-making and decision-making processes may reveal a prospect or proposal for change that needs to be reported. Monitoring of proposals as well as of decisions will therefore significantly enhance the kind of "early warning" capability that will make the requirement work effectively, even if "likelihood" of change (as a prompt for actual reports) is judged to arise only at the stage of consents or commitments to proceed (e.g. with a development) rather than at the proposal stage.

5.19 The issue of "likelihood" has been explored to some extent in a few more or less analogous situations in case-law and in guidance in individual countries. These have perhaps served to illustrate how challenging it is, in an ecological context, to codify interpretations of the degree of "trigger sensitivity" that may be appropriate[28].

5.20 Clearly it would defeat the aim of the provisions if unduly strict standards of evidence and substantiation were imposed. Such standards might be appropriate if what had to be submitted by the Party was an in-depth dossier on the likely change at issue; but it seems more appropriate instead to view this in terms of aiming to stimulate much more rapid and "provisional" initial alerts about problems that may or may not then need deeper investigation.

5.21 There should therefore be a presumption in favour of precaution, i.e. not demanding too high a degree of certainty before the elementary step of basic reporting is taken. Sometimes a small initial risk may be warning about a much bigger impending harm to the site. Non-linear or "threshold" responses to pressure are common in ecosystems, and Resolution No. 5 (1998) will act most effectively as a conservation tool when its implementation is "tuned" to react sensitively to the earliest indications of any potential for harm. The same applies to the actions that may need to follow, i.e. it is wisest to intervene before real and important ecosystem-level changes have occurred. Prevention is usually more cost-effective than remediation.

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[28] Discussed further in Pritchard, D E (2014a). Change in ecological character of wetland sites - a review of Ramsar guidance and mechanisms. Consultant report to the Ramsar Convention. 102pp.

5.22 All that being said, it is at the same time also possible that the system could be open to abuse (or at least ineffectiveness) if the merest suggestion or anxiety on the part of one person were enough to trigger an obligation to report. The appropriate approach will lie somewhere in a "middle ground" of informed, authoritative or expert judgement, supported by the "risk management" approach outlined above.

6. RESPONDING TO ACTUAL OR POTENTIAL CHANGE IN ECOLOGICAL CHARACTER

> **Guideline 13**: Once likely change has been detected and reported to the Bern Secretariat, its *implications* can be *assessed*. Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) are important tools for evaluating the significance of potential change and its implications for relevant conservation objectives. Much international guidance on EIA and SEA exists to help with this.

6.1 The first response to an initial alert about an issue which may lead to a change in a site's ecological character is likely to be some kind of deeper investigation into the nature and extent of the potential implications for the values at stake. This can usefully draw on some of the methodologies and best practices that have developed worldwide over many decades in the context of Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA). These mechanisms offer systematic and repeatable ways of evaluating both the likelihood of change and its significance for relevant conservation objectives[29].

6.2 For that part of the Emerald Network which is made up of Natura 2000 sites in the European Union, the EU Habitats Directive requires that projects likely to have a significant effect on any such site should be subject to an assessment of their implications for the site. Guidance on this has been published by the European Commission[30]. Two other Directives govern a more general system of EIA and SEA, on which guidance is also available[31, 32].

6.3 Two main references exist in the Bern Convention context. The first, Standing Committee Recommendation No. 25 (1991) (on the conservation of natural areas outside protected areas proper), recommends that Contracting Parties examine the possibility of taking measures including:

- submitting all projects, plans, programmes and measures with an impact on the natural and semi-natural environment to an examination of environmental compatibility, with a view to protecting nature and landscapes;
- requiring that any request for permission to undertake a development or activity that is liable to have an adverse ecological impact on an Area of Special Conservation Interest be accompanied by an environmental impact assessment or equivalent assessment making it possible to determine the precise effects of the proposed development or activity on the ecological characteristics which warranted the inclusion of the area concerned in the list of ASCIs; and

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[29] It might at first seem counterintuitive to place the discussion about impact assessment in this section on "responses" to change/likely change, but there is an important reason for this. A key emphasis of Bern Resolution No. 5 (1998) is on rapidly informing the Secretariat when a potential problem is first detected. The preceding sections of this document on risk assessment and early warning are material to the same idea of "early alerting" to issues that may need attention. It would go against that purpose to make undertaking the kind of systematic, in-depth investigations normally contemplated in EIA/SEA a part of the initial "detection" process or a pre-condition before "reporting" occurs. Hence in the logic of the scheme described here, EIA/SEA take place instead as part of the "response" to an early alert about a potential problem.

[30] European Commission (2002). *Op cit.*

[31] European Community (1985). Council Directive 85/337/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment. Official Journal L 175, 5.7.1985: 40–48. Subsequently amended by Directives 97/11/EC, 2003/35/EC, 2009/31/EC, 2011/92/EU and 2014/52/EU. For various related guidance documents, see *http://ec.europa.eu/environment/eia/eia-support.htm* .

[32] European Union (2001). Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment. Official Journal L 197, 21.07.2001: 30–37. For various related guidance documents, see *http://ec.europa.eu/environment/eia/sea-support.htm* .

- advising government agencies against carrying out, authorising or subsidising developments or activities which are shown by the environmental impact assessment or equivalent assessment adversely to affect significantly the ecological characteristics mentioned above.

6.4 The second reference is a report on the effects of windfarms on birds, produced in 2013, which (despite the specificity of its title) includes advice of a generally-applicable nature on principles and best practice concerning impact assessment[33]. The Standing Committee at its 33rd meeting welcomed this advice, and invited all Parties to take it into account.

6.5 Other biodiversity-related Conventions have formally adopted guidance on EIA and SEA, including the Convention on Biological Diversity[34], the Convention on Migratory Species[35] and the Convention on Wetlands (Ramsar)[36]. These Conventions have done so in a coordinated way, so that the same principles have been agreed by each of them, thus ensuring compatibility of the global standards that apply in each context. Related advice is also available from the International Association for Impact Assessment (IAIA)[37].

> **Guideline 14**: Normally the identification of *options for responding to change* will follow a hierarchical approach, in which Parties would first seek to avoid adverse change where it can be avoided, then mitigate (including by habitat restoration) where it cannot be avoided, and then provide habitat compensation where it cannot be avoided or mitigated. Alongside the objective of maintaining site ecological character, the additional "sufficiency" objectives expressed for the Emerald Network as a whole should play an important part in determining the particular measures that are necessary in a given case for responding to change or likely change in a site's character.

6.6 Bern Convention Resolution No. 5 (1998), after asking governments to report change or likely change affecting the ecological character of a designated ASCI, goes on to provide that "where any such changes come to light, the Standing Committee may advise the government concerned on steps to be taken". Recommendation No. 16 (1989) asks States to ensure that activities adjacent to or in the vicinity of Emerald Network sites do not adversely affect them. The EU Habitats Directive requires that projects likely to have a significant effect on a Natura 2000 site should generally only be permitted when the assessment of their implications shows that there will not be an adverse effect on the site's integrity.

6.7 In line with Guideline 1 above, and against the background of Recommendation No. 157 (2011), the ultimate objective to be achieved by the "steps to be taken" in response to a "Resolution No. 5 (1998) report" in relation to any Emerald Network site (which will be a Natura 2000 site in the EU) is the maintenance of its ecological character.

6.8 Normally the appropriate approach for Parties to take to this will be a hierarchical one, whereby they would, as the first priority, be expected to *avoid* adverse change where it can be

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[33] Bern Convention (2013a). Wind farms and birds: an updated analysis of the effects of wind farms on birds, and best practice guidance on integrated planning and impact assessment. Document T-PVS/Inf (2013) 15, prepared by BirdLife International on behalf of the Convention and tabled at the 33rd meeting of the Standing Committee, Strasbourg, December 2013.

[34] Convention on Biological Diversity (2006). Impact Assessment: voluntary guidelines on biodiversity-inclusive impact assessment. Decision VIII/28 adopted by the 8th meeting of the Conference of Contracting Parties, Curitiba, Brazil, 20-31 March 2006.

[35] Convention on Migratory Species (2002). Impact Assessment and Migratory Species. Resolution 7.2 adopted by the 7th meeting of the Conference of Contracting Parties, Bonn, Germany, 18-24 September 2002.

[36] Ramsar Convention (2008b). Environmental Impact Assessment and Strategic Environmental Assessment: updated scientific and technical guidance. Resolution X.17 adopted by the 10th meeting of the Conference of the Contracting Parties, Changwon, Republic of Korea, 28 October - 4 November 2008.

[37] See for example International Association for Impact Assessment (2005). Biodiversity in Impact Assessment. Special Publication Series No. 3. IAIA, Fargo, USA.

avoided, then *mitigate* (including by habitat restoration) where it cannot be avoided, and then provide habitat *compensation* where it cannot be avoided or mitigated. The Ramsar Convention provides one example of detailed guidance on how to apply such a hierarchical approach[38].

6.9 In the light of the discussion in section 3 above about challenges concerning definition of appropriate baselines, there may be occasions when "maintaining ecological character" (in the sense of retaining or restoring historical conditions) is no longer possible, or at least is no longer feasible by "anything short of heroic action and intensive manipulation and management"[39]. Response options (other than continuing to try to prevent change) in such circumstances might include partitioning safeguard/restoration efforts according to which aspects of the site are amenable to this and which are not; managing for a different new stable character; and managing for a broader envelope of continuing future fluctuations/directional changes.

6.10 Acknowledging these possible scenarios raises an additional risk. It is not easy to design workable "checks and balances" in policy that will distinguish (a) genuinely irreversible (and/or even desirable) shifts in an ecosystem's conditions from (b) claims by vested interests that something has irreversibly shifted when it has not. In these circumstances, precaution must again be the underlying principle.

6.11 Advice on mitigation in relevant circumstances may be drawn from guidance adopted by the Bern Convention on specific topics, such as wind farms and recreational fishing. Advice on habitat compensation in a generic sense has not been adopted under the Convention, but sources in other fora, including the European Union and the Ramsar Convention, offer considerable body of relevant guidance[40].

6.12 One key issue associated with compensation is its inherent uncertainty: most compensatory measures are essentially experimental, and hence they demand a large margin of precaution (for example by providing areas that are much larger than the areas to be lost). Another issue is timing: compensation should generally be delivered in advance of negative impacts, so that the desired ecological functioning can be verified and any necessary recolonisation/ translocation etc. can take place. In interpreting the EU guidance on this, IUCN's Environmental Law Centre concluded that compensation must therefore "be a proactive policy rather than one designed only to react to proposals" [41], thus linking to later expansions of thinking (by others) on approaches to so-called "mitigation banking"[42].

6.13 There is a need with all of the above for a wise mix of (a) systematically-applied safeguards and (b) case-specific judgements. In the multivariate and uncertain situations which typically characterise threats to the ecological character of Emerald Network sites, responses based on formulaic, criteria-based decision-making are not always possible or appropriate. Approaches

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[38] Ramsar Convention (2012c). An Integrated Framework and guidelines for avoiding, mitigating and compensating for wetland losses. Resolution XI.9 adopted by the 11th Meeting of the Conference of the Parties, Bucharest, Romania, 6-13 July 2012.

[39] Hobbs, R J, Higgs, E S and Harris, J A (2009). Novel ecosystems: implications for conservation and restoration. Trends in Ecology and Evolution 24(11): 599-605.

[40] See in particular:
European Commission (2000). Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC. EC DG Environment, Brussels.
European Commission (2007). Guidance document on Article 6(4) of the Habitats Directive 92/43/EEC. EC DG Environment, Brussels.
Ramsar Convention (2012c). *Op cit*.
Pritchard (2014a). *Op cit*.

[41] di Leva, C and Tymowski, W (2000). The Ramsar Convention on Wetlands: the role of "urgent national interests" and "compensation" in wetland protection. IUCN Environmental Law Centre. Document SC25-8 tabled at the 25th Meeting of the Ramsar Standing Committee, Gland, October 2000.

[42] See for example US Environmental Protection Authority (2013). Mitigation banking factsheet. Available at https://www.epa.gov/cwa-404/mitigation-banking-factsheet .

need to be developed therefore that are based at least as much on risk management, precaution, and a graduated spectrum of response options.

6.14 In addition to the maintenance of the ecological character of individual sites, there are conservation objectives to be achieved by the Emerald Network as a whole. These are normally described in Emerald documents in three main ways: (i) in terms of "ensuring the long-term survival of the species and habitats" concerned, or (ii) by reference to Article 4 of the Convention which seeks the "conservation of the habitats of the wild flora and fauna species, especially those specified in Appendices I and II, and the conservation of endangered natural habitats", or (iii) in terms of achieving the "favourable conservation status" of the species or habitats concerned.

6.15 These network-level objectives are the basis for those parts of the Emerald process which provide for an evaluation of the "sufficiency" (numbers, extent, quality, distribution, diversity, representativity, functional coherence, species population viability etc.) of the total list of sites at a biogeographic scale, so that any gaps or shortfalls in this can be addressed[43]. Analogous concepts (often expressed in terms of overall network "coherence") have been developed in the context of other site networks, notably in Natura 2000 and under the Ramsar, OSPAR and HELCOM Conventions[44].

6.16 This is relevant in the present context because these additional objectives expressed at network level should play an important part in determining appropriate responses to change or likely change in the ecological character of the constituent sites. Any such change may have implications for the continuing attainment of overall network "sufficiency", and this may provide the benchmark for determining the particular measures that are necessary in a given case to avoid, mitigate or compensate for the change.

6.17 This is made more explicit in some of the other systems referred to above. The EU Habitats Directive provides in Article 6.4 that "if, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest […], the Member State shall take all compensatory measures necessary *to ensure that the overall coherence of Natura 2000 is protected*" (emphasis added).

6.18 The Ramsar Convention COP has encouraged its Parties to take measures to compensate for any loss of wetland functions, attributes and values[45, 46], and Article 4.2 of the Convention requires compensation to be provided in the specific case of the site reductions which are exceptionally allowed under Article 2.5. Adopted guidance on the latter suggests a need, when providing such compensation, to take into account "the *maintenance of the overall value of the Contracting Party's wetland area* included in the Ramsar List *at the national and global level*"[47] (emphasis added).

7. THE ROLE OF THE CASE FILE SYSTEM

Guideline 15: Good monitoring, early detection of problems, reporting and rapid responses in accordance with Resolution No. 5 (1998) will often

[43] Bern Convention (2013b). Revised 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. Document T-PVS/PA (2013) 13 agreed by the 33rd meeting of the Standing Committee, Strasbourg, December 2013.

[44] For a full comparative review, including source references, see Pritchard (2014b). Ecological networks - a strategic review of aspects relating to migratory species. Report for the Convention on Migratory Species, tabled as Document UNEP/CMS/COP11/Doc.23.4.1.2 for the 11th meeting of the Conference of Contracting Parties, Quito, Ecuador, 4-9 November 2014.

[45] Ramsar Convention (1999b). Compensation for lost wetland habitats and other functions. Resolution VII.24 adopted by the 7th meeting of the Conference of Contracting Parties, San José, Costa Rica, 10-18 May 1999.

[46] Ramsar Convention (2012c). *Op cit*.

[47] Ramsar Convention (2002). General guidance for interpreting "urgent national interests" under Article 2.5 of the Convention and considering compensation under Article 4.2. Resolution VIII.20 adopted by the 8th meeting of the Conference of Contracting Parties, Valencia, Spain, 18-26 November 2002.

help to avoid the need to embark on the weightier process of opening and pursuing a *case file*.
Where case files do become necessary in relation to threats to specific sites, they should give particular attention to solutions that maintain the ecological character of the site.

7.1 A familiar response option in the Bern Convention context is the practice of examining "case files" under a procedure first approved by the Standing Committee at its 3rd meeting in 1984 and specified in more detail at the 13th meeting in 1993[48]. Provision also exists for conducting "on the spot enquiries" or "on the spot appraisals". Sometimes (not always) these responses are occasioned by threats to specific sites. They are commonly triggered by information from experts and other stakeholders (e.g. NGOs) rather than by reports under Resolution No. 5 (1998) from the Contracting Party.

7.2 Case files and on-the-spot appraisals can of course help with the assessment of potential impacts; but the extra value they normally add through the involvement of the Convention is in going further into drawing out and testing facts about the issue concerned, sharing perspectives on it from beyond the country concerned, mobilising political support in an international forum for resolving it, and debating, recommending and supporting potential solutions. An added ingredient in this latter aspect is the scope for the Standing Committee to adopt specific and formal recommendations for action, which in time may come to have the status of customary law.

7.3 Systems which are (to different degrees) analogous to this exist in other Multilateral Environmental Agreement (MEA) contexts. These include the Ramsar Convention's "Advisory Missions", the African-Eurasian Waterbird Agreement's "Implementation Review Process", the World Heritage Convention's "List of World Heritage in Danger", the Council of Europe's "Diploma for Protected Areas"[49] and the European Union's legal enforcement processes for protection of Natura 2000 sites[50]. There are increasingly frequent examples of two or more of these systems being operated together on a joint basis, where interests in the particular site or conservation issue concerned are shared. Such an approach is one important way of demonstrating efficient synergies between related MEAs.

7.4 A central consideration in all these systems is the delicate political balance between incentive or assistance on the one hand, and assurance of compliance or enforcement on the other. The different regimes show a range of ways in which this balance is struck. In this, a key point is whether the consent of the country concerned is required before the relevant procedure can be progressed, or whether instead it is progressed by decision of the majority or by a supervisory body to whom this responsibility is entrusted (e.g. a Convention secretariat or committee), in the context of a shared international interest in the outcome.

7.5 For an enforcement procedure to be effective, some kind of meaningful sanction must at least in principle be available. For an incentive/assistance procedure to be effective, it must be capable of meeting the need of the country concerned, for example by offering the right

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[48] Subsequently set out in Bern Convention (1999). Opening and closing of files - and follow up to recommendations. Secretariat memorandum, Document T-PVS (99) 16.

[49] The Diploma is relevant to the present discussion because it is awarded for a limited period, and can be renewed or withdrawn subject to a system of review and assessment. It has thus been able to function as an instrument for responding to threats and other problems at sites, where the high-profile decision as to renewal of the Diploma may be a key spur to securing resolution of the problem concerned.

[50] For an early comparative review of these different mechanisms, see Pritchard, D E (2000). Review of the case file system. Document T-PVS (2000) 16 rev, tabled at the meeting of the Select Committee for the Strategic Development of the Bern Convention. Strasbourg, April 2000.
More in-depth reviews of the Ramsar Advisory Missions process can be found in (i) Pritchard (2014a) (*op cit*) and (ii) Jones, T A and Pritchard, D E (2018). A comprehensive review and analysis of Ramsar Advisory Mission reports. Consultancy report for the Ramsar Convention.

expertise within a sufficiently short timescale to solve urgent problems. The systems with the most effective incentives are those which can draw on funds dedicated to the purpose.

7.6 It would be highly desirable to expand the Bern Convention mechanisms to include a "rapid response consultation" or "advisory service" function, which could operate more flexibly and speedily alongside the full case file or appraisal functions, in circumstances where the latter are not necessarily warranted or where they would only follow later.

7.7 With any of these systems there may be scope, and every effort should be made, to help governments ultimately to present the solutions that are arrived at as examples of pioneering field-leadership, so they can reap political kudos at home and on the international stage. This in itself is a form of incentive.

7.8 Some 168 case file cases have been opened or proposed in the Bern Convention context to date. Of these, approximately 60 are to some degree site-related, and just under 20 of the latter remain open, possible or on stand-by as at mid-2018. A smaller number relate directly to Emerald Network sites, but the proportion doing so may perhaps be expected to increase as the Network itself continues to become more completely established across Europe.

7.9 Ultimately the case file system may become a useful source of "real-life" experiences and lessons learnt concerning ecological character change detection, impact assessment, mitigation, compensation or other imaginative planning solutions. A recent review of the 82 Advisory Missions completed thus far in the Ramsar Convention's analogous process has taken just such an approach[51].

7.10 At the request of the Standing Committee, a sample of relevant Bern case file documentation was analysed during 2018 with this in mind, and tested against a template of key questions about potential lessons emerging and "good practices" revealed. The process has proved to be less fruitful than in the Ramsar example however. This is partly because (until now) a basis for addressing specific aspects of ecological character concepts in the Bern Convention context has not been provided. It is mainly however because the Bern case file system does not generate a final report for each case with information on how competing positions were resolved (or not) and how the case was concluded. Cases involving on the spot appraisals might be thought to provide a more solid basis for examining this, but appraisal reports themselves only appear at an interim stage of the case, and there are too few that address relevant issues with wider applicability.

7.11 Cases themselves may arise because of a weak appreciation thus far in the Bern context about the steps involved in defining, monitoring, detecting and assessing potential site ecological character issues, as now elaborated in the present document. It is to be hoped therefore that the guidelines set out here will in future contribute to improved practices that help to prevent problems developing to the stage where opening of a case file is required.

7.12 Against the background of the present document's treatment of ecological character issues, a small number of recommendations for the future operation of the case file system can be made, as follows:

(i) Consideration should be given to expanding the Bern Convention's mechanisms to include a "rapid response consultation" or "advisory service" function, which could operate more flexibly and speedily alongside the full case file or appraisal functions, in circumstances where the latter are not necessarily warranted or where they would only follow later.

(ii) Where a case file is developed in relation to threats facing a particular site or sites, the risks and response options involved should as far as possible be framed in relation to the objective of maintaining the ecological character of the site(s). (Wider implications for maintaining the sufficiency of the Emerald Network and the

[51] Jones and Pritchard (2018). *Op cit.*

favourable conservation status of relevant species and habitats should of course also be addressed).

(iii) When a given individual case file case is concluded, a final summary report should be produced, indicating the steps that were taken, the solutions that were found, and any lessons for potential application elsewhere that were learnt.