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EuMon policy briefs – No 3

Identification of national responsibilities and conservation priorities in Europe

Summary

Priority setting using red lists is prawn to not address conservation needs properly and also do not necessarily indicate monitoring needs. A solution to the problem is the determination of national responsibilities. Such a method allows an assessment of conservation actions required in each EU Member State, identification of basic knowledge gaps on biodiversity, and thus supports allocation decisions of conservation budgets. Several European countries have developed such tools. However, these methods widely vary in their usage of different parameters, are applicable only for species within the nation, and are not comparable across countries. They further mix the concepts of red lists and international importance and are not scalable to different geographic scales. These methods, hence, are of little use for a state union like the European Union. Therefore, the EuMon project developed a new method, which distinguishes itself from earlier methods by a clear separation of the concepts of red lists and international importance, functionality with low data availability, and free scalability across nations, regions, or even continents. Hence, the national responsibility method developed by EuMon can assist decision makers in European conservation policy and may lead to a more transparent decision process.

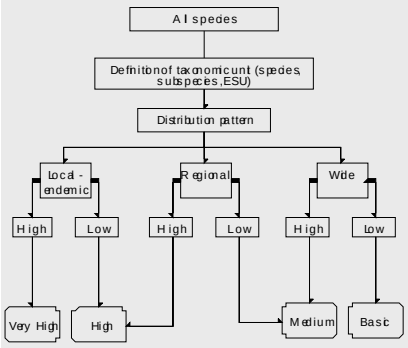
Contact persons: Dirk S. Schmeller – dirk.schmeller@ufz.de - +33 561 04 03 73
Klaus Henle – klaus.henle@ufz.de - +49 341 235 1270

1 Introduction

The concept of national responsibility has been developed as a response to short-comings of the sole use of red list criteria to guide conservation actions. It is based on the fact that different parts of a species' range make different contributions to its overall viability and persistence. For example, areas with a high abundance of a particular species are usually small and rare, with the result that parts of a species' distribution range are more important for the global survival of a species than others. Several countries in Europe have developed methods to assess national responsibility for the conservation of species but these methods differ widely in their usage of different parameters, are not scalable to geographic areas of different size, and are applicable only for species within the nation and thus not comparable across countries As there is an urgent need of harmonizing measures and guidance for how to invest the limited financial and human resources in observing and conserving biodiversity, we describe a newly developed method for determining national responsibilities and conservation priorities in species conservation that can be applied consistently across Europe. The determination of national responsibilities and conservation priorities will allow focusing conservation efforts on populations that are important for the global survival of a species and will increase the efficiency of the decision making process in European conservation.

2 The method

The final determination of conservation priorities comprises two major steps. In a first step, national responsibilities are determined and then, in a second step, are combined with the threat status of species to the conservation priority of this species. The assessment of national responsibilities itself comprises 3 major steps, (i) the determination of the taxonomic unit addressed (usually the species level), (ii) the determination of the distribution pattern of that taxonomic unit, and (iii) the estimation of the proportion of the focal areas' population to the global population (Box 1).



$$DP_{exp} = \frac{distribution_{reference\_area}}{reference\_area_{total}}$$

$$DP_{obs} = \frac{distribution_{focal\_area}}{focal\_area_{total}}$$

Box 1: ***Determination of national responsibilities.***

The national responsibility can be assessed on all taxonomic or non-taxonomic units, such as evolutionary significant units (ESUs), given that sufficient data is available. The first decision is necessary to be able to concentrate the conservation effort on distinct units. Consideration whether a taxonomic unit is to be protected by its own right has to be done beforehand to be able to determine the responsibilities of different (political) entities for this unit.

Step 2 is to determine the distribution pattern of the species. 'local' defines a species with a patchy distribution within one biogeographic region, 'wide' refers to a species distribution spanning more than one biogeographic region. The third category is 'regional'. The category comprises species with two thirds of the distribution area located in one biogeographic region.

Step 3 calculates the expected distribution probability (DP_{exp}) in the reference area, as the ratio of the distribution area of the species in the reference area and the size of the reference area. This expected value is compared to the ratio of the distribution range of the species in a focal region to the total size of the focal region (DP_{obs}) .

If the latter value is twice as high as the expected value, the probability of the occurrence of a species in the focal area is high, otherwise it is classified as low. We followed the rationale that if a species occurs in a country across a larger area than expected based on its European distribution, the living conditions in that country should be particularly suitable for the species. Hence, the loss of populations of that species in that particular area would be a substantial loss for the global population.

These three steps result in 4 national responsibility categories: very high, high, medium, and basic. Those categories are then combined with the conservation status as following from the IUCN Red List, the Annexes of the Nature Directives, or the national red lists (if

no other data on the threat status is available) to determine the conservation priority ranks (Table 1).

	very high	high	medium	basic
Extinct in the Wild	25	20	17	16
Critically Endangered Annex II (HD) priority species	22	17	14	13
Endangered Annex II (HD) Annex I (BD)	20	15	12	11
Vulnerable Annex IV (HD)	18	13	10	9
Near Threatened	16	11	8	7
Least Concern Annex V (HD) Annex II (BD)	11	6	3	2

Table 1: Score table for the determination of conservation priority ranks. The top row gives the level of national responsibility and the first columns the conservation status resulting from Red Lists and /or the Annexes of the Habitats or Birds Directives (HD and BD, respectively). Red presents the score range for rank 1, orange for rank 2, yellow for rank 3, and green for the lowest rank 5. Rank 4 is not displayed and comprises species with too sparse data to assess national responsibilities and/or conservation status (IUCN categories DD and NE).

The rationale between the different categories is as follows. In the case of the highest rank, “immediate action” (rank 1), the loss of the focal nation’s population would lead to the global extinction of the species since the main distribution area lies within the countries borders and the species is highly threatened. The country has to undertake immediate conservation actions and needs to allocate considerable resources to the conservation of such species to increase populations in space and numbers. In the case of species extinct in the wild, the distribution of potential habitat should be assessed, and the country or countries that have the highest proportion of still suitable habitat should take the lead for programs to re-establishing populations in the wild.

Species in the high priority rank (rank 2) would become globally extinct in the case of the loss of the focal nation’s population as a high proportion of the distribution area lies within a nation’s or region’s borders and the species is threatened or nearly threatened. The country has to give conservation action a high priority and has to set up a long-term conservation plan to improve the conditions for the species.

The priority rank (rank 3) comprises species, for which the loss of the focal nation’s population may lead to global extinction in the long-term. The population of such species in the focal area is either small compared to the total distribution range or the threat status is low. However, populations at the periphery of the distribution are often evolutionary significant units and thus important for evolutionary processes and essential for the maintenance of genetic diversity and should be placed in this category. A nation’s conservation actions are necessary to be started with priority.

Species with a regional or local distribution or no available distribution data and without entries in either the international or the national red lists were assigned to a data deficiency rank (rank 4). Here, we follow the rationale that widely distributed species usually are not considered endangered in national or the IUCN Red List with very few exceptions (e.g. *Zootoca vivipara pannonica, Triturus carnifex*), while regional and local species usually have small population sizes and thus have an increased risk of extinction. Therefore, we argue that the knowledge on the latter species needs to be improved to allow for an assessment of conservation status and priority.

The lowest priority rank “under observation” (rank 5), comprises species, which are distributed mainly outside the focal nation’s area and/or whose global survival is not endangered. The country needs to undertake monitoring activities in longer intervals to be able to assess the status of its populations over time, but does not need to undertake any other conservation actions.

3 Rationale of the method

The assessment of our method is solely intended to support practitioners in their decisions. Though other factors, e.g., societal or cultural aspects, may also have to be considered, our method combines a well-established system, the red lists, with a more recent concept that assesses the importance/responsibility a nation has for the conservation of a species – the national responsibilities.

Besides management actions that may be needed for rank 1 and rank 2 species, the ranks readily indicate monitoring needs. Our method demands close monitoring of species in rank 1 and 2, frequent monitoring for species in rank 3, and the set up of new monitoring programs for species in rank 4, needed to improve the knowledge on such species. In case, a species falls into rank 5, practitioners could redirect resources from such monitoring programs to others in more urgent need. In a second step, the proposed scoring process could be followed by a risk assessment that optimizes the trade-offs between chance-of-success, money required, actors involved, and management actions needed across several species, for which priorities are set. However, risk assessment is data-demanding and labour-intensive and therefore is not frequently applied even to a single species.

4 Limits of the method

The method described here is limited by the availability and quality of data, but these requirements are less than for other existing methods and may even trigger the accumulation of more data from so far neglected species groups. In biodiversity conservation generally, data availability is a major problem. Whereas birds, amphibians, and reptiles are characterized by a large amount of available data on the global and regional distribution range, the synthesized information for plants is already considerably less. If distributional knowledge is inadequate, the expected value of proportional distribution cannot be calculated and our method fails. However, such should be marked as data deficient (as in red lists).

An unbiased determination of the expected value of proportional distribution within a focal area requires that distribution units are studied with comparable methods both in the focal country and in the reference area. This means that (i) species not reported from a certain area are lacking in that area with high probability or at least with equal probability in the reference and the focal area, (ii) units of the focal and the reference areas have the same or similar size or can be converted into each other, and (iii) all units are representatively distributed throughout both the focal and the reference areas.

Our approximation of abundance with proportional distribution may not be valid in some species, due to variations in density, habitat quality, and movement patterns. Hence, the real conservation responsibilities in a certain area might not be assessed perfectly. Here, the use of abundance data instead of proportional distribution would be the sole solution. Such data would allow more easily assessing the relative importance of distribution centres versus range margins of species. For the rare cases, in which abundance data are available across the range of a species, our method can be easily applied by exchanging distribution for abundance.

Since the number of biogeographic regions, in which a species is present, is a criterion for classification of its distribution pattern, the definition of biogeographic region must be precise. For political and implementation reasons, we follow the latest definition of the biogeographic regions as agreed on by the geographic seminars and the EU Commission (http://dataservice.eea.europa.eu/atlas/viewdata/viewpub.asp?id=2671), even so they do not fully correspond to the real floral distribution, defining a biogeographic region. We stress that the increase of the number of regions covered by a species

distribution may inadequately decrease the national responsibility for the species in all countries where it is present. To counteract such problems, we decided to implement the cut-off value of two thirds in a region for the definition of the regional category, more likely reflecting the real biological situation.

5 Conclusion

The method of EuMon considers all factors contributing to the assessment of conservation status, comprising biological and distributional factors and extinction risk due to the consideration of the IUCN Red List. However, we avoid double consideration of these factors by stringently separating the concepts of national responsibilities and threat status. Our method of priority setting can be readily applied to any revision of an international red list. This makes our method sustainable, granting comparability of priority lists over long time periods. An alternative method basing on many factors would be highly complex and difficult to implement. Application of such a complex method, considering distributional factors, extinction risk on different geographic scales, biological, societal, logistical and economic factors, to a large number or even all taxa, on different geographic scales and across the globe is impossible. Further, societal and economic factors will be especially subject to extensive debates with little hope of clear agreements between different interest groups on national, regional, or continental level, which drastically reduces the value of such a method.

Further reading

Coates, D. J., and K. A. Atkins. 2001. Priority setting and the conservation of Western Australia's diverse and highly endemic flora. Biological Conservation **97**:251-263.

Couturier, A. 1999. Conservation Priorities for the Birds of Southern Ontario. Bird studies Canada, Port Rowan, Ontario.

Dimopoulos, P., E. Bergmeier, and P. Fischer. 2006. Natura 2000 habitat types of Greece evaluated in the light of distribution, threat and responsibility. Biology and Environment: Proceedings of the Royal Irish Academy 106B:175-187.

Dunn, E. H., D. J. T. Hussell, and D. A. Welsh. 1999. Priority-setting tool applied to Canada's landbirds based on concern and responsibility for species. Conservation Biology 13:1404-1415.

Keller, V., and K. Bollmann. 2004. From red lists to species of conservation concern. Conservation Biolgy 18:1636-1644.

Schmeller, D. S., B. Gruber, E. Budrys, E. Framsted, S. Lengyel, and K. Henle. 2008. National responsibilities in European species conservation: a methodological review. Conservation Biology **22**:593-601.

Schnittler, M., and K. F. Günther. 1999. Central European vascular plants requiring priority conservation measures: an analysis from national Red Lists and distribution maps. Biodiversity and Conservation 8:891-925.