Review

National Responsibilities in European Species Conservation: a Methodological Review

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Abstract: *One particular challenge in reducing the loss of biodiversity by 2010, as agreed on at the Earth Summit in 2002, is to assign conservation tasks to geographic or administrative entities (e.g., countries or regions) on different geographical scales. To identify conservation tasks, it is imperative to determine the importance of a specific area for the global survival of a species. So far, these national or subnational responsibilities for the conservation of species have been included differently in methods prioritizing conservation. We reviewed how 12 European and 3 non-European methods determined national conservation responsibilities and evaluated the international importance of a biological population. Different countries used different methodologies, which made a direct comparison of assessments of national responsibilities among countries extremely difficult. Differences existed in the importance criteria used. Criteria included population decline, range reduction, rarity status, degree of isolation of a population, endemism, proportional distribution, and geographic location. To increase comparability, it is imperative to develop criteria for which data are generally available and to standardize the methodology among countries. A standardized method would allow conservation decisions to be based on the conservation status of a species and on the responsibility of a geographic or administrative entity for the survival of a species. We suggest that such a method should use a scalable index of proportional distribution, taxonomic status, and the distribution pattern of a taxon or species as key elements. Such a method would allow for the creation of hierarchical lists and would be highly relevant for parts of the world with multiple political jurisdictions or state unions and for nations with regional governmental structures. Conservation priorities could then be reasonably set by combining national responsibility assessments with the international conservation status of a species.*

Keywords: conservation methods, conservation priorities, Europe, national responsibility, species conservation

Responsabilidades Nacionales en la Conservación de Especies Europeas: una Revisión Metodológica

Resumen: *Un reto particular en la reducción de la pérdida de biodiversidad al 2010, como se acordó en la Cumbre de la Tierra en 2002, es la asignación de tareas de conservación a entidades geográficas o administrativas (e.g., países o regiones) en diferentes escalas geográficas. Para identificar las tareas de conservación, es imperativo determinar la importancia de un área específica para la supervivencia global de una especie. Hasta ahora, estas responsabilidades nacionales o subnacionales para la conservación de especies ha sido incluida de manera diferente en los métodos para priorizar la conservación. Revisamos cómo 12 métodos europeos y 3 no europeos han determinado responsabilidades de conservación nacionales y*

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evaluamos la importancia nacional de una población biológica. Distintos países han utilizado metodologías diferentes, lo cual hizo que la comparación directa de evaluaciones de las responsabilidades nacionales fuera extremadamente difícil. Existieron diferencias en la importancia de los criterios utilizados. Los criterios incluyeron declinación poblacional, reducción de área de distribución, estatus de rareza, grado de aislamiento de una población, endemismo, distribución proporcional y localización geográfica. Para poder comparar, es imperativo desarrollar criterios para los cuales generalmente existen datos y estandarizar la metodología entre países. Un método estándar permitiría que las decisiones de conservación se basen en el estatus de conservación de una especie y en la responsabilidad de una entidad geográfica o administrativa en la supervivencia de una especie. Sugerimos que ese método deberá utilizar un índice escalable de distribución proporcional, estatus taxonómico y el patrón de distribución de un taxón o especie como elementos clave. Dicho método permitiría la creación de listas jerárquicas y pudiera ser muy relevante para partes del mundo con múltiples jurisdicciones políticas o para países con estructuras de gobierno regionales. Entonces, las prioridades de conservación podrían definirse razonablemente mediante la combinación de evaluaciones de la responsabilidad nacional con el estatus de conservación internacional de una especie.

Palabras Clave: conservación de especies, Europa, métodos de conservación, prioridades de conservación, responsabilidad nacional

Introduction

Red lists—inventories of the conservation status of plant and animal species—are the most prominent and important tool for conservation priority setting, despite the fact that they were not actually designed for such an application (The Nature Conservancy 1988; IUCN 1996, 2001). Consequently, several shortcomings of red lists for setting conservation priorities have been identified (e.g., Mehlman et al. 2004; Eaton et al. 2005). For example, red lists, especially those with a small geographic range (national or regional red lists), place conservation emphasis on species, for which localized populations may only represent the periphery of their entire geographic distribution (Gärdenfors et al. 2001). Nevertheless, populations at a species' distributional limit may be relatively unimportant in ensuring the long-term persistence of the species. This is particularly relevant in the case of global warming, which may push the ranges of species out of one country and into another. Hence, threat status as indicated by red lists does not always reflect actual conservation needs and is inadequate for setting conservation priorities (Gärdenfors 2000, 2001). As a response, the concept of national responsibility as a complementary tool was developed for determining conservation priorities (Schnittler et al. 1994; Schnittler 2004). These methods are still in an early stage of development and need to be standardized before they are too diversified to be compatible among countries and regions.

The basis for the concept of national responsibility is the fact that different parts of a species' range make different contributions to its overall viability and persistence (e.g., Hanski & Woiwod 1993; Hanski et al. 1996; Hanski 2001). 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 (Rodriguez 2002). Hence, the national responsibility concept was developed to denote the importance of a local population for the global survival probability of a species. To determine the international importance of a population (the importance of a localized population to the global survival of a species), methods use several range-based criteria, such as proportional distribution, relative abundance, or location of the distribution center (Schnittler 2004).

Although the notion of international importance of a region for the conservation of biodiversity—with respect to its irreplaceability for achieving complete coverage of the targeted subset of biodiversity (Brooks et al. 2006)—has been included in methods of conservation prioritization in non-European countries, the concept of national responsibilities is more advanced in Europe. The wide availability of a method determining national responsibilities would allow conservation decisions to be based not only on the conservation status of a species but also on the responsibility of a geographic or administrative entity for the persistence and survival of a species. The determination of national responsibilities would create lists hierarchical in regard to geographic scales. Such a hierarchical list of responsibilities would be highly relevant for parts of the world with multiple political jurisdictions (e.g., Africa, Asia, South America), state unions (e.g., European Union), and nations with regional governmental structures (e.g., the United States, Australia, Canada, South Africa).

We reviewed how 12 European and 3 non-European methods determined national responsibilities and especially how they evaluated the international importance of a given biological population. We discuss the methods in light of, for example, metapopulation theory, distribution and abundance patterns of species, and the availability of data. We conclude with suggestions for the development of a common approach for the determination of national responsibilities.

International Importance in Current Methods

In Europe several national and multinational concepts to determine national responsibilities and conservation priorities (co)exist. All methods share—relatively and explicitly—the notion of international importance of a region for the global survival of a species (Table 1). All the methods also assume that proportional distribution can serve as a proxy for relative abundance and that relative abundance serves as a proxy for relative importance to species viability. The latter assumption frequently, though not invariably, holds true (Henle et al. 2004*a*, 2004*b*). However, generally the methods differ considerably in their importance-based criteria and in the degree to which they separate these from red-list criteria (Table 1). The methods can be divided into multinational and cross-European methods (Europe, Tucker & Heath 1994; Burfield et al. 2004; van Swaay & Warren 1999); European national responsibility methods (Great Britain, Avery et al. 1994; Warren et al. 1997; Gregory et al. 2005; Switzerland, Keller & Bollmann 2004; Italy, Sindaco 2005; Hungary, Z. Varga et al., unpublished data; Germany, Gruttke et al. 2004); European priority-rank methods on a national or subnational scale (Germany, Denz 2003; Northrhine-Westfalia, Schütz et al. 2004); and non-European priority rank methods on a national or subnational scale (South Africa, Freitag & Jaarsveld 1997; Ontario, Couturier 1999; Canada, National Recovery Working Group Canada 2005).

Several of the methods we reviewed included an assessment of international importance almost exclusively as the proportional distribution in the assessed area relative to a reference area. These methods differ in regard to their reference area. The Species of European Conservation Concern (SPEC) method for birds (Tucker & Heath 1994; revised version by Burfield et al. 2004) or butterflies (van Swaay & Warren 1999) assesses the European relative to the global distribution. Other methods focus on single nations (Avery et al. 1994; Warren et al. 1997) or even subnational levels (Schütz et al. 2004) and apply global, European, or national distribution as reference areas (Table 1). Owing to their focus on Europe, the SPEC methods were not set up to determine national responsibilities, but to determine conservation priorities on a European scale. Therefore, downscaling to a national or regional level was not foreseen. The SPEC methods further differ in the weight given to the relative importance of the assessed to the global population in their assessments. By starting with an area (or distribution) criterion and using area criteria frequently throughout the assessment steps, the value given to the assessment of international importance of a European population is more pronounced in the SPEC method for butterflies (van Swaay & Warren 1999) than in the method for birds (Avery et al. 1994).

Other methods combine proportional distribution with other range-based criteria for determining international importance. The method of Gruttke et al. (2004) combines the area component with the distribution center, giving a higher value if the proportion of the population in the assessed area is located in the distribution center. For other methods the biogeographic relevance of populations (Table 1) is combined with either the proportion of the world population in the assessed area (Steinicke et al. 2002; Gruttke et al. 2004), the proportion of the global or continental distribution in the assessed area (Freitag & Jaarsveld 1997), or the relative abundance on different geographic scales (Couturier 1999). In general, however, the methods do not give clear reasons for their setting of range proportion limits of a species for the different categories.

The method of Keller and Bollmann (2001, 2004) is novel in determination of proportional distribution of a population. In contrast to a simple cut-off value for proportional distribution, they calculate an expected proportional distribution in the assessed area as the ratio of distribution area of the species in the reference area and size of the reference area. This expected value is compared with the ratio of distribution range of the species in the assessed area to the total size of assessed area. For international importance, 2 categories are distinguished: low (less than twice the expected ratio) and high (at least twice the expected ratio). Setting of the limit for a high international importance to double the expected population distribution is done arbitrarily. Despite arbitrary limits, such a method has the advantage that it can be transferred to different geographic scales, allowing determination of responsibility on a regional, national, supranational, and global scale.

Few methods explicitly include isolated outposts in their assessment of national responsibilities and international importance (Steinicke et al. 2002; Denz 2003; Gruttke et al. 2004; Schütz et al. 2004; Z. Varga et al., unpublished data). Isolated outposts are populations that are permanently isolated from the main distribution area by geographic barriers and more than 10 times farther away from the next population (next-closest population reachable within 10 years of normal range expansion) but at least 100 km away from any other population (sensu Steinicke et al. 2002). They may fulfill the criteria for evolutionarily significant units (ESUs; Moritz 1994) and as such are of high conservation importance in regard to the conservation of evolutionary processes (e.g., Vrijenhoek 1998).

All methods combine at least some criteria of conservation status and international importance in determination of conservation priorities. Nevertheless, none of

Table 1. Summary of the criteria included in the different methods for determining national responsibility for priority setting in species conservation.*

	European methods												Non-European methods		
	$SPEC_{birds}$	$SPEC_{birds}2$	$SPEC_{Bf}$	$Birds_{GB}$	$Birds_{GB}2$	Bf_{GB}	$Birds_{CH}$	NR_{IT}	NR_{HU}	NR_{DE}	PR_{DE}	PR_{NRW}	PR_{SA}	PR_{ON}	PR_{CA}
Red list status (IUCN)	+	+	+	+	+	+	+			+	+	+			+
Red list status (European/national)	+	+	+	+	+	+							+	+	+
EU Habitat Directive (Annex II status)									+						
National abundance (common/rare)		+			+		+	+					+	+	
Number of national sites/populations				+	+	+			+				+		
Assessed distribution															
Europe—World	+	+	+											+	+
National—World				+		+	+	+		+	+	+		+	+
National—Europe					+								+	+	+
Endemism/biogeographical significance	+	+	+					+	+				+		+
Isolated “outposts”/ESU									+	+	+	+			
Distribution centre identified										+	+	+			
Historical population development		+		+	+	+	+		+						
Historical distribution development		+													
Size of the focal area							+	+				+			
Taxonomic unit													+	+	+
Expert opinion									+						

**Abbreviations: SPEC, Species of European Conservation Concern; bf, butterflies; NR, national responsibilities; PR, priority rank method; GB, Great Britain; CH, Switzerland; IT, Italy; HU, Hungary; DE, Germany; NRW, North Rhine-Westphalia (Germany); SA, South Africa; ON, Ontario; CA, Canada. References for the different methods: $SPEC_{birds}$, Tucker et al. 1994; $SPEC_{birds}2$, Burfield et al. 2004; $SPEC_{Bf}$, van Swaay & Warren 1999; $Birds_{GB}$, Avery et al. 1994; $Birds_{GB}2$, Gregory et al. 2005; Bf_{GB}, Warren et al. 1997; $Birds_{CH}$, Keller & Bollmann 2004; NR_{IT}, Sindaco 2005; NR_{HU}, Varga Z. et al., unpublished data; NR_{DE}, Gruttke et al. 2004; PR_{DE}, Denz 2003; PR_{NRW}, Schütz et al. 2004; PR_{SA}, Freitag & Jaarsveld 1997; PR_{ON}, Couturier 1999; PR_{CA}, National Recovery Working Group Canada 2005.*

the European approaches explicitly combines national responsibility evaluation, red-list evaluation, or other criteria to determine an overall priority setting. Suggestions for such integration have been developed, for example, for South Africa (Freitag & Jaarsveld 1997) and for Canada (National Recovery Working Group Canada 2005). These approaches combine national responsibility assessments with evaluations of red-list status and taxonomic uniqueness into an overall ranking system (Table 1).

International Importance and National Responsibility Setting

A large variety of methods exist to examine the international importance of populations and to set national responsibilities for the conservation of a species. They range from those that require few data to those that require data for a complex set of criteria that are currently only suitable for well-monitored species groups. The methods we examined used various criteria. These criteria included conservation status, national abundance and rarity, number of sites and populations, distribution range of a species and its distribution center, endemism and biogeographical importance (including ESUs and isolated outpost), fragmentation index of a species distribution, historical population development, and taxonomic status of a species. Few methods allow for easy adjustments to future data availability and other developments, such as revisions of red lists.

Cut-Off Values

Most methods lack explicitly formulated cut-off values that allow scientists to classify local populations in regard to their conservation needs. The Hungarian method, which classifies local populations as either "biogeographically highly significant" or "biogeographically significant," is an example of the lack of an explicitly formulated cut-off value (Z. Varga et al., unpublished data). Hence, a consistent assessment of the international importance of a population by different people is difficult, if not impossible. Other methods use different cut-off values, which makes comparisons among studies, methods, and regions difficult. Moreover, some of these cut-off values cannot be easily generalized to other nations or scales (e.g., that 33% of the global distribution is located within the focal area, a criterion in the German method).

For such generalizations use of expected proportional values of a national population is more amenable, as is done in the Swiss approach (Keller & Bollmann 2001, 2004). Such an approximation, however, may appear to be problematic for widely distributed species that have large populations in several countries. For example, no country would have an elevated responsibility for species with a wide distribution in the reference area. Nevertheless, all countries would still share basic responsibility for such species. Thus, only small reference areas or very high threshold values are problematic because then all species fall into the basic responsibility class. Similarly, a small country may not have a high probability of harboring an endemic species on its territory for which it would have a high responsibility but will nonetheless share responsibilities with neighboring countries for species ranging onto its territory.

An important advantage of the index suggested by Keller and Bollmann (2001, 2004) is that it is freely scalable and adjusts international importance to the scale of the country. The index therefore ensures that none of the assessed countries will have negligible conservation responsibilities for species inhabiting a country's territory. Furthermore, national responsibilities might be the same for a range of countries, but their conservation priority for the species might differ, depending on other factors besides national responsibility included in the priority setting (see "Best-Practice Recommendations").

Endemism and Isolated Outposts

Indicating whether or not a species is endemic is a straightforward criterion because endemism is well documented in a large number of species and is important in setting national responsibilities. Indeed, endemism is included as a criterion in 7 of the methods we examined. In contrast, isolated outposts as a criterion are considered in only a few methods (Table 1). Although the conservation value and the underlying concept of an ESU is clear (Moritz 1994), putting the concept into operation is expensive. Furthermore, it is difficult to assess in most cases and has led to a lively debate (Fraser & Bernatchez 2001; Mace & Purvis 2008). The criteria for determining ESUs described by Steinicke et al. (2002) and Gruttke et al. (2004) may circumvent expensive genetic analyses, but may not be fully reliable and may be confounded by data availability. Hence, concrete ESUs have rarely been determined (Fay & Nammack 1996), which makes the criterion only applicable in special cases.

Population Decline, Rarity, Historic Distribution

Other criteria such as population decline are difficult to apply to any species because data are only available for well-studied species, such as birds, butterflies, and amphibians. Similarly, the rarity status of a species is strongly affected by data availability, and for many species there are limited data on their historic distribution ranges. Nevertheless, information on the historic distribution of species may become more readily available in the future through development of a collaborative, global database incorporating the 1 to 2 billion biodiversity records available in natural history museums across the globe (Guralnick et al. 2007).

Species Distribution and Range Occupancy

Consideration of species distribution centers presents problems because the assumption that species are most abundant in the center of their distribution is not true for a large proportion of species (Sagarin et al. 2006). In addition, consideration of the distribution center is only possible with uniformly distributed species, and with species with disconnected distribution patterns, such as boreal-montane or alpine species that have no definable distribution centers. Generally, the geographic distributions of species are determined by a large number of processes on multiple scales (Maurer & Taper 2002), and the assumption of even distributions or range occupancy may be invalid in many species.

Range occupancy is affected by several factors, such as abundance, body size, range size, niche breadth and position, habitat heterogeneity, population trend, migratory status, and trophic and foraging groups (reviewed in Hurlbert & White 2008). The main determinants of range occupancy, however, seem to be local abundance, niche position, and spatial aggregation (Hurlbert & White 2008), which are all linked to habitat suitability. Because habitat suitability varies spatially, population size and distribution pattern are skewed depending on habitat quality, as is found for common birds (Freckleton et al. 2006) and herbaceous forest species (Kolb & Diekmann 2004).

Furthermore, only a small proportion of potential habitat may serve as a population source, as observed, for example, in hawks (Lawler & Schumaker 2004). Thus, areas with a high abundance of a species are small and rare, which results in parts of a species' distribution range being more important for conservation than others (Rodriguez 2002), in concordance with metapopulation theory (e.g., Hanski 1982, 2001). Hence, approximating abundance with proportional distribution may not be a valid assumption in some species.

Abundance Data

Spatially explicit abundance data would allow circumventing the problems with proxies. Nevertheless, few of the existing methods consider abundance, mainly because the data are not available for a wide range of species, except for a few well-monitored species groups such as butterflies (van Swaay et al. 1997) and birds (Gregory et al. 2006). Gregory et al. (2002) considered a close approximation for abundance in their assessment of localized distributions, whereas Couturier (1999) included relative abundance on different geographic scales. These considerations suggest that an abundance criterion should be implemented in future assessments of national responsibilities to overcome limitations of abundance approximations. Currently, the implementation of abundance data in methods that determine national responsibilities works only for a limited set of species, but should be interchangeably usable with proportional distribution or similar proxies of population abundance. The use of abundance data instead of only distribution patterns, however, would provide information about distribution centers of species following from metapopulation theory (e.g., Hanski 1982, 1994*a*, 2001) because abundance data would indicate areas that may act as source populations or provide better living conditions for a particular species. It is only with such data that limitations of proxies in identification of areas important for the viability of a species can be overcome. Therefore, collection of abundance data should be politically supported, despite the cost and time intensity of data collection.

Threat and Conservation Status

All methods, except for the South African method, consider threat status of the species for determining national responsibility. Nevertheless, the way threat status is implemented varies among each of the methods. Z. Varga et al. (unpublished data) consider threat status by using species lists from annexes of the European Habitats Directive, which list species of special conservation concern for maintenance of European biodiversity. Despite being one of the most important conservation tools in Europe, the list is under strong political influence and does not comprise a complete list of species that have conservation needs. Most of the other methods consider threat status given by regional or global red lists, predominately following the IUCN criteria (IUCN 2001). Nevertheless, a recent review of categorization systems of threatened species on the American continent demonstrates that only a few red lists adequately represent the threat status of species, for example, because of the effect of subjectivity (de Grammont & Cuaron 2006). The effect of subjectivity of regional red lists is minimized by comparison to the global red list in only one case (National Recovery Working Group Canada 2005).

More fundamentally, there is a conceptual problem in mixing threat status and international importance. A species highly threatened in a specific country can occur with some single individuals in that country, leading to a high preservation effort for species there. Owing to the low number of individuals, however, global survival of the species will not be influenced at all. In contrast, a common, unthreatened species may occur mainly in one country and therefore international importance of the population and responsibility in that country for the species is very high (e.g., alpine newt [*Triturus alpestris*] in Germany; Steinicke et al. 2002).

Furthermore, some criteria used in the methods to determine national responsibilities are also included in assessment of conservation status. Examples of such double consideration are the fragmentation index used in the Italian method (Sindaco 2005) and the population-decline criterion in the method of Gregory et al. (2002). Both criteria are major components for species vulnerability in the IUCN Red List (IUCN 1996, 2001). Mixing of such criteria and red-list status in determining national responsibilities makes it difficult to assess the weights given to particular parameters. This is true even when national responsibilities are retained as a prioritization method separate from prioritization entailed in red lists or other approaches. We strongly discourage inclusion of red-list status in methods to determine national responsibilities. An exception to this may be made on the basis of the precautionary principle in the case of globally endangered species because their global survival could be strongly influenced even by events geographically limited to particular countries that harbor only a marginal fraction of the remaining global population(s).

Best-Practice Recommendations

Ideally, a population viability analysis (PVA) for the global population would be carried out to determine the importance of the population falling within a nation (see, e.g., Gärdenfors 2000). Only a full PVA can reveal the true importance of marginal fractions of remaining population(s) and hence determine the national responsibility of a country. Nevertheless, a PVA will be impossible for routine assessments in the foreseeable future because of lack of data. Therefore, none of the existing methods used PVA, and it cannot currently be suggested as an applicable methodology. Here, we suggest that a best-practice system for determination of conservation responsibilities should meet the following basic requirements: be applicable to all or most taxa, be adaptable to different spatial scales, be precise and clear in defining responsibility categories, have minimal data requirements, and retain the conservation status and national responsibility as conceptually separate factors.

From our review several key elements of national responsibilities and international importance became apparent. Development of a new method may consider taxonomic status (including ESUs and outposts), endemism, location of the source population, and distribution range and pattern as determinants of national responsibilities. However, the ESU concept is difficult to implement in an assessment of national responsibilities, which underlines the need for further research. Other key elements are easier to implement, given that data are available. Including distribution pattern of a species would allow managers to consider endemism and the robustness of species to environmental perturbations, various climatic conditions, and dispersal abilities. We adhere to the notion that the diversity of habitats a species occupies is an indication of that species' ability to deal with a wider or smaller range of environmental impacts (e.g., Wiens et al. 1997; Wiens 2001). This also follows from the abundance–range size relationship (Gaston 1996; Gaston et al. 2000) because distribution range is affected by dispersal ability, with poorly dispersing species being slow (re)colonizers (reviewed in Lester et al. 2007).

A new method should therefore distinguish between species with very local and patchy distributions (endemics) and species with regional or wider distributions. We believe that a method requiring little data, yet based on good scientific reasoning, could be developed in combination with a scalable index (as proposed by Keller and Bollmann [2001, 2004]) and a decision on the taxonomic status of a species. Such a method would clearly assess the international importance of a certain population in either a political (e.g., a nation) or geographical unit (e.g., a biogeographic region) for global survival of a species. If abundance and other demographic data are available for the assessed species, location of the source population could also be incorporated into the method. In that case, precision of determination of international importance of a geographical or political area would be considerably enhanced, following from metapopulation theory (e.g., Hanski 1991, 1994*a*, 1994*b*) and population viability models (e.g., Henle et al. 2004*a*, 2004*b*).

Nations should then set conservation priorities by reasonably combining national responsibility assessments with the international conservation status of a species on the basis of the IUCN Red List criteria. We agree with Fitzpatrick et al. (2007) that a priority system should comprise only a limited number of criteria and should not try to incorporate a long list of factors with a complex weighting system as recently put forward by Miller et al. (2007). In contrast to the method proposed by Fitzpatrick et al. (2007), we think it is more amenable to stick to criteria that are straightforward to assess and are not readily disputable. Their criteria 7 (species of recognized economical value) and 8 (species of cultural importance) may be counterproductive in the way that economical value and cultural importance may differ considerably among countries and even within multiethnic countries and therefore may be highly disputable. With such potentially disputable criteria it will be difficult to reach agreements among different groups on a global priority list. However, our suggested method will produce lists similar to Fitzpatrick et al. (2007) because it leads to a priority list that prioritizes species for which a nation has high responsibilities and for which global conservation status is unfavorable.

Conclusion

A common approach to determine national responsibilities and to set conservation priorities would allow direct comparisons between provinces, countries, regions, and even continents. Conservation decisions would become more transparent, which would allow an optimal allocation of limited financial and human resources across supranational states (U.S.A., Canada, Australia) and state unions (European Union) in a comprehensive way. Poorer countries, located in biodiversity-rich regions, may also use such a common approach to explain demands for financial support for the conservation of populations and species of high international importance. A common approach would also make clear to decision makers where biodiversity monitoring needs to be intensified and improved in order to close information gaps in regards to distribution, abundance, and taxonomic status of species.

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