Brief Report

Problems in Threatened Species Conservation: Differences in National Red Lists Assessments with Global Standards

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Abstract: The solution of transnational environmental problems in the field of the protection of threatened species and conservation biology directly depends on the level of international communication, which can significantly decrease due to differences in Red Lists and Red Data Books of different levels. In order to identify the similarities and differences in approaches to the assessment of national Red Lists and Books of the Baltic Sea region countries (Russia, Denmark, Germany, Lithuania, Finland, Poland and Sweden) with the IUCN Red List, a comparative analysis was carried out. It was determined that the level of discrepancy between Red Data Lists and Books varies considerably, with differences in the scales of species categories, species lists and categories. Most of the threatened species at the national level are not listed under the IUCN Red List, while species in a more stringent category at the national level prevail (37% and 3% on average, respectively). However, national Red Lists and Red Data Books do not take into account the global trend of the risk of extinction of species. The percentage of species with insufficient information to define a category at the national or global level ranges from 6% to 28%. These discrepancies make it difficult to exchange data on threatened species and create a unified database with information on protected species at different levels and, therefore, reduce the effectiveness of biodiversity conservation activities at regional and international levels. The results also demonstrate that countries have an international responsibility to conserve a species, and the cases identified can provide useful additional information to guide a national conservation strategy.

Keywords: red lists; red data books; threatened species; species categories; species protection; biodiversity conservation; Baltic region

1. Introduction

The global assessment of species shows that loss of biodiversity currently continues to be one of the most acute and urgent environmental problems facing all states and is of a cross-national character. At the same time, an important requirement for planning and prioritizing conservation actions for threatened species is to correctly determine the status of a species according to their exposure to extinction risk [1]. Following these goals, the International Union for the Conservation of Nature (hereafter IUCN) has developed a global standard for assessing the extinction risk of species, with a set of categories to describe it. Such categories are based on thresholds of depopulation, areal distribution, population size and structure, and quantitative estimates of extinction risk [2–4].

Since most conservation activities are carried out at the national level, there is a demand for Red Data Books and Red Lists at the state level [5].

We took the Baltic region as one of the most demonstrative and representative examples of territories illustrating not only the diversity of species, but also the problems in the field of biodiversity conservation. In addition, the Baltic region is a prime case with a high concentration of national Red Lists and Red Data Books. In some cases, they have a

legally enshrined official status and are a crucial tool for biodiversity status determination, for instance, in Russia and Denmark. They can also be applied as reference publications and scientific recommendations, as is typical in Lithuania, Latvia, and Poland. In this case, specific lists of protected animal and plant species complement them in order to organize their legal protection.

Though the national Red Lists and Red Data Books have different statuses in different countries, all of them are important in organizing conservation activities at the national level and are important as a source providing information on the state of biodiversity in global conservation processes [6]. Considering the above, the IUCN supports the states' practice to compile their own Red Lists, for which the Union has specifically developed guidelines for the regional application of the IUCN Red List categories and criteria [5].

The application of common recommendations and global minimum standards in the maintenance of Red Lists and Red Data Books in the assessment of threatened species statuses is necessary to facilitate the exchange of information between the relevant authorities of states and international structures.

However, national evaluations may have different categories and criteria, and rarity statuses for the same species may differ by administrative boundaries where the species has been assessed. Existing differences between national Red Lists and the IUCN Red List can have a significant impact on conservation planning, lead to inconsistencies and, therefore, complicate the achievement of objectives [7]. Thus, national Red Lists contain information on the species' extinction risk, distribution, state of local populations, population decline, cultural and conservation value, protection priorities, or several of these factors at once [1].

While a national species evaluation system can be effective within a particular country, differences with other Red Lists and Red Data Books make it difficult to compare a status directly with that established in other countries, as well as with the global one, and make it difficult to consolidate information from different countries [1].

The erroneous exclusion of species from lists of threatened species, both globally and nationally, can lead to their complete extinction [7]. Moreover, in general, the differences and inconsistencies between Red Data Books and Red Lists lead to a distrust of them as reliable sources of information [7]. Nevertheless, there are relatively few published studies comparing national, regional, and Global Red Lists [8,9].

Based on the above introduction, this study assessed the similarity of approaches to the assessment of individual national Red Lists and Red Data Books of the Baltic Sea Region with the Global Red List of the IUCN. This, in turn, made it possible to understand the extent of consideration given to the global trends of threatened species at national levels and the cross-national responsibility of countries in the conservation of biodiversity.

In order to facilitate the desired reduction in discrepancies, a typology of the main causes of discrepancies was determined, and the frequency of each was estimated. The results are expected to help identify priority directions for increasing the harmonization of national Red Lists with the global approaches and standards and among themselves, as well as to facilitate a more effective exchange of information that is needed to protect threatened species and to create a unified database on these species.

2. Materials and Methods

Seven countries with access to the Baltic Sea were selected to demonstrate the presence of inconsistencies between national Red Lists and Red Data Books in the Baltic Sea region. The factual material for the present study includes national Red Lists and Red Data Books of Russia [10,11], Denmark [12], Germany [13], Lithuania [14], Finland [15], Poland [16–18], and Sweden [19]. We evaluated these documents for their similarity to the IUCN Red List [20].

The category scales of the listed lists and books were compared, as well as the species lists of each of the mentioned documents according to the cited sources and the available open data.

The scales of the Red List and Book categories were analyzed for their accordance with the IUCN Red List scale. If a mismatch was found, there was a customized system developed for the categories to compare the national level of extinction risk to the global level of extinction risk.

The species lists, in turn, highlighted species included in both national Red Lists and Books, as well as the IUCN Red List. They included the following groups:

A.   Nationally threatened/not assessed globally: when a species has been assessed and listed in the national red list/book but not found on the IUCN Red List;

B.   Species listed on both the national Red Lists and Red Data Books and the IUCN Red List, among which:

    B.1   Species with the same category at the national and global levels;
    B.2   Species with a more stringent category at the national level;
    B.3   Species with a more stringent category at the global level;
    B.4   Species for which there is insufficient data to determine a national or global category;
    B.5   Other species with no comparable categories (for species with "Endangered" and "Least Concern" categories because both categories are not "Endangered"; species with "Not Applicable for Regional Assessment" category).

3. Results and Discussion

The accepted systems of the species category scales in the Red Lists of Denmark, Lithuania, Finland, Poland, and Sweden generally correspond to the IUCN Red List category scale [2].

The scales of species categories in the Red Lists of Germany and the Red Data Book of Russia (for the list of objects of the flora included in the Red Data Book of the Russian Federation) differ from the scales of the IUCN Red List categories; therefore, they were compared according to Table 1.

Table 1. Correlation of the German Red Lists and the Red Data Book of Russia with the IUCN Red List categories.

| Categories of the German Red Lists	IUCN Categories	Categories of the Red Data Book of Russia	IUCN Categories
0—Ausgestorben oder verschollen (extinct or not found anymore)	RE/EX	0—Probably extinct	RE/EX
1—Aussterben bedroht (on the brink of extinction)	CR	1—Endangered	CR
2—Stark gefährdet (endangered)	EN	2—Declining populations	EN
3—Gefährdet (vulnerable)	VU	3—Rare	VU
G—Gefährdung unbekannten Ausmaßes (unknown danger degree)	DD	4—Undefined by status	DD
R—Extrem selten (extremely rare)	NT		
V—Vorwarnliste (species to be monitored)	LC		
D—Daten unzureichend (insufficient data)	DD	5—Restorable and recoverable	NT
*—Ungefährdet (invulnerable)	LC		
♦ (nb)—Nicht bewertet (unappreciated)	NE		

A comparative analysis of national Red Lists with the IUCN global list demonstrated that the Lithuanian Red List has the highest degree of consistency with it at 32% (with a total of 566 assessed species in the national list), and the Finnish Red List has the least consistency at 2% (with a total of 35,998 assessed species in the national list) (Figure 1).
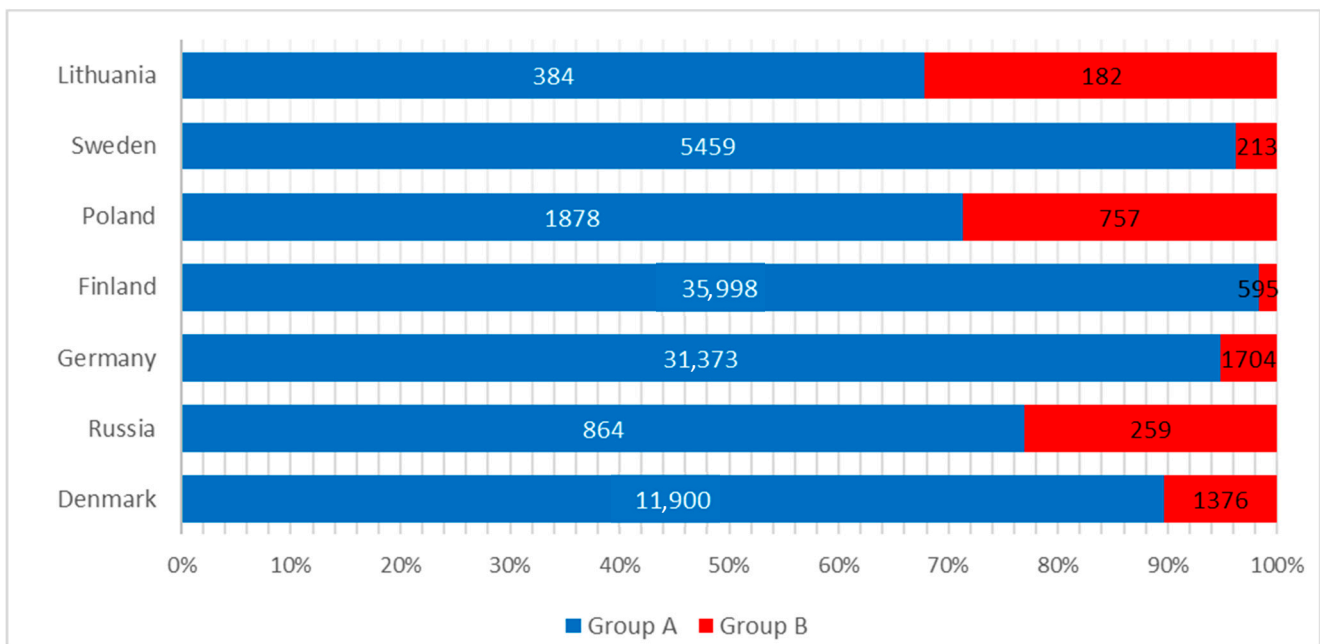
Figure 1. Distribution of species on the national Red Lists and Books by groups A and B.

The percentage of species listed as threatened at the national level only (group A) averaged 85% for all countries reviewed.

For species at risk of extinction at both national and global levels (group B.1), the distribution of categories is as follows (Figure 2): the highest proportion of such species is found in Finland (about 65%) and Denmark (40%), and the lowest in Poland (6%) and Lithuania (10%).
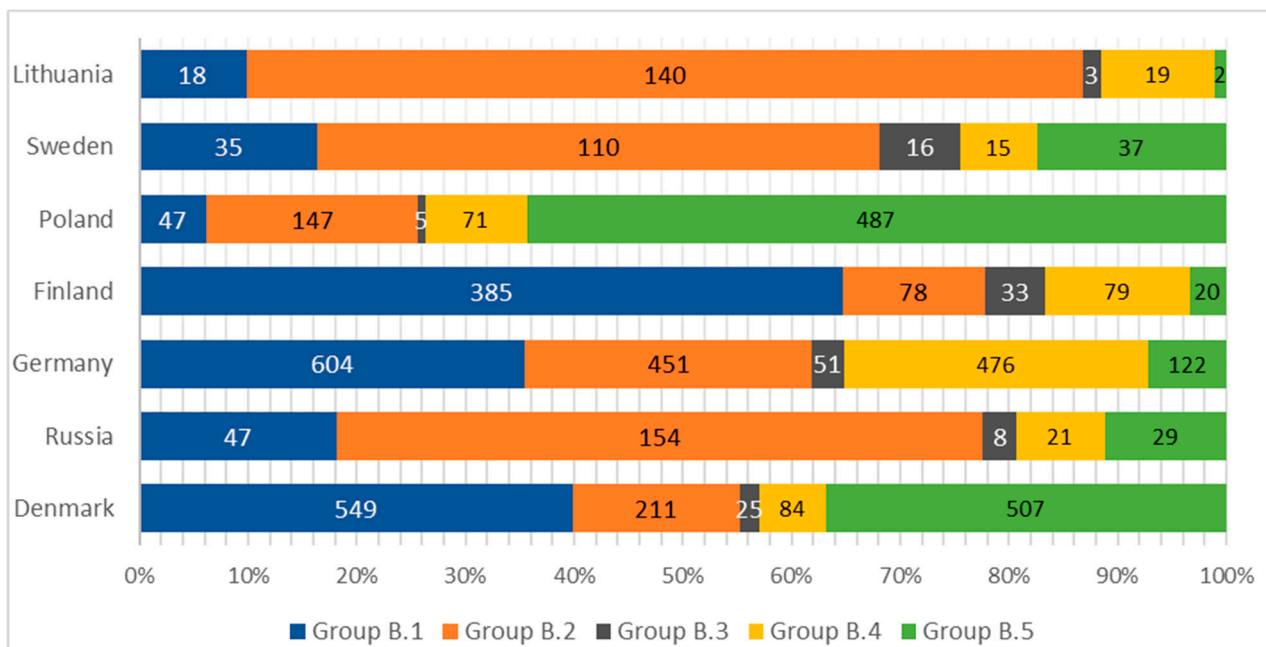
Figure 2. Distribution of categories of national Red Lists and Books according to groups B.1–B.5.

Species with a more stringent category at the national level (group B.2) are most numerous in Lithuania (77%), Russia (59%), and Sweden (52%), while the lowest values are in Finland (13%) and Denmark (15%).

For species at higher risk of extinction globally (group B.3), the results are relatively homogeneous, ranging from 1% in Poland to 8% in Sweden.

The highest proportion of species with insufficient data for category determination at the national or global levels (group B.4) is in Germany (28%), with the lowest in Denmark (6%), Sweden (7%), and Russia (8%).

A significant predominance of group A species (nationally threatened/not assessed only globally) over group B species (species on both the national Red List or Book and the IUCN Red List) in each national Red List or Book is to be expected, as long as the species is not endemic to the country. However, a more stringent national level category is often due to the higher extinction risk of a subpopulation compared to the entire population.

Differences in the categories of threatened species are often accompanied, first, by a lack of data to determine whether a species is threatened and, second, by poor communication in national and international contexts [21]. A lack of consistency in approaches, terminology, and classification standards in the Red Data Books and Red Lists ultimately creates communication barriers in the exchange of information on threatened species and consequently limits cooperation between countries in addressing the protection of threatened species [21].

At the same time, the lack of reliable data on species is one of the main reasons for the incorrect determination of their extinction risk [22]. Thus, on average, about 100 species considered in this study, which currently have insufficient data to determine the level of their extinction threat, may potentially be at risk of total extinction.

While an average of 37% of species have a higher risk of extinction at the national level, the reverse is true for the 3% of species with a higher risk of extinction at the global level. These groups of species require special attention because small subpopulations of a species are at greater risk of extinction than the global population of that species. On the other hand, national populations of a threatened species may be stable, while simultaneously, in other regions, they may be declining and in biological regression [6].

The above-mentioned cases in national Red Data Books and Red Lists and differences between national and global standards can pose potential problems for conservation efforts at different levels and are also evidence of the need to strengthen cooperation between national and international agencies to create a unified database on threatened species and address existing gaps in their protection.

4. Conclusions

Thus, our analysis has established that most of the reviewed national Red Lists and Red Data Books comply with global standards. At the same time, there remain some national Red Lists and Red Data Books which apply their own unique approaches to the assessment of threatened species. However, regarding the global character of the biodiversity loss problem, it is worth noting that the consolidation of countries' efforts in dealing with this issue also consists in the harmonization of actions and the adoption of common standards for all, including in assessments of threatened species. We believe that in order to unify national assessments with global standards, it is appropriate to use the Guidelines for Application of IUCN Red List criteria at regional and national levels.

The lists of group A species demonstrate that most of the species protected at the national level are not mentioned in any way at the international level. At the national level, the global risk of species extinction is not specifically taken into account, while group B demonstrates the international responsibility of countries to conserve species. At the same time, countries should pay attention to group B 3 while prioritizing conservation actions. Therefore, the cases can be useful and complementary information for national strategies of species conservation.

Existing discrepancies in approaches to assessing threatened species and the continued non-application of a unified standard by all countries can be a serious barrier to the exchange of information on threatened species between national and global agencies and make it difficult to create a unified database with information on these species.

It is important to note that using national-level extinction risk categories without global trends as the only tool for prioritizing species protection can lead to suboptimal conservation decisions, since threats at the national level provide only part of the information required for conservation planning and prioritization and urgency of action. At the same time, the global risk of extinction to a species can be additionally taken into account in the national Red Lists and Red Data Books, and these can be used to prioritize actions regarding threatened species at the national level, which should also be reflected in national conservation policies and strategies.

Among other things, some countries only publish lists of threatened species, so information about species that are not on the list is not clear. Thus, it is impossible to know whether species have not been assessed for risk of extinction or have been assessed, but are not threatened.

In the conservation of biodiversity as a global social issue, the role of close international relations and information cooperation should be emphasized. For this reason, countries should reach agreement on the assessment of endangered species based on unified global standards and, at the same time, work together to form a common database of threatened species that would combine information on these species from all countries on a joint platform. Furthermore, it is advisable to focus on the unification of legislative instruments and approaches for national Red Lists and Red Data Books, based on the global standards necessary for the implementation of national environmental policy. We expect that this will facilitate greater synergy, the rapid dissemination of information about changes, and the adoption of effective measures to address species conservation issues, and in turn, the national Red Lists and Red Data Books will become an effective mechanism in assessing and monitoring the status of the global biodiversity.

At the same time, intensified information exchange about the state of populations at different levels and the creation of a unified database containing information about threatened species will help improve the dissemination of information about these changes and enable the adoption of effective measures to address species conservation issues.

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