

Effectiveness of “The IUCN red list of threatened species” application on a regional scale: current state of the “Red Data books” of Russia

Igor Popov, Anastasia Fadeeva, Elena Palenova, George Shamilshvily, Kirill Gorin, Andrey Burdo, Evgenia Melchakova, Yulia Trofimova, Viktor Sukristik, Nadezhda Morova, Ksenia Kroo and Yulia Kirillova

Department for Applied Ecology, Faculty of biology, Saint Petersburg State University, Universitetskaya nab., 7–9, St. Petersburg, 199034, Russian Federation; igoriashapopov@mail.ru

Address correspondence to Igor Popov

Abstract

Nowadays at least 140 Red Data books or lists are used in Russia. They reflect threatened species of various subdivisions of Russia in addition to all-Russian Red Data book. None of them uses criteria for the species assessment of the modern version of the IUCN list. Non-threatened species had not been included in the Russian red books. Most of species listed in the all-Russian Red Data book (77 %) has not yet been assessed for the IUCN red list. These particularities indicate on the necessity of gap-analysis in the planning of the following work on the IUCN red list keeping. It should focus first of all on revealing of the most urgent objectives, but not on the simple increase of species assessments. Now more than a half of species of “The IUCN red list of threatened species” are not threatened ones, that is why its title does not reflect its contents.

Keywords: Red Data book, red list, methodology

Introduction

“The IUCN Red list of threatened species” was created as an instrument for the work on nature conservation, and it is meant for the coordination of conservative activities on a global scale. It contains a system of categories for species assessment, and recommendations for its application on a regional scale. Effectiveness of the red list was questioned, sometimes. It was criticized for not enough substantiated assessments and for unofficial recommendations, which still influence the management of biological resources. That is why its credibility was considered as “endangered” (Mrosofsky, 1997). However since the IUCN list contributes to nature conservation, it is still usually considered as an effective tool (Possingham et al., 2002; Rodrigues et al., 2006; Editorial, 2008; Vié et al., 2008).

Our study focuses on the analysis of the IUCN red list application on a regional scale. Red Data books of Russia seem to be interesting in this context, because they are manifold and reflect a condition of a large territory. On the one hand, they give the possibility to estimate the IUCN red list impact; on the other hand, they indicate on ideas, which could be promising internationally, for work on the red lists’ keeping.

Materials and methods

Red Data books of Russia, and of the republics of the Soviet Union, have been composed since 1978 under the influence of the IUCN. In the 1990s after the breakdown of the USSR and new political system formation Red Data books appeared anew. Nowadays Russia consists of 85 “federal subjects”. Every subject conducted some work on the Red Data books. Meanwhile there is a Red Data book for all

Citation: Popov, I., Fadeeva, V., Palenova, E., et al. 2017. Effectiveness of “The IUCN red list of threatened species” application on a regional scale: current state of the “red books” of Russia. *Bio. Comm.* 62(1): 57–60. doi: 10.21638/11701/spbu03.2017.107

Author’s information: Igor Popov, Ph.D., Senior Researcher, orcid.org/0000-0002-2564-3294; Anastasia Fadeeva, Student; Elena Palenova, Ph.D. student, orcid.org/0000-0002-2857-8790, Researcher ID: C-9145-2017; George Shamilshvily, Ph.D. student, Junior Fellow Researcher, orcid.org/0000-0002-2183-7630, Scopus ID: 56590099600; Kirill Gorin, Student; Andrey Burdo, Student; Evgenia Melchakova, Head of the Department of Monitoring of the Forest Genetic Resources, “Center of Forest Protection in the Leningrad Area”, orcid.org/0000-0002-6004-5337, Researcher ID: C-8526-2017; Yulia Trofimova, Student, Viktor Sukristik, Ph.D. Student, orcid.org/0000-0002-4753-9527, Researcher ID: C-8468-2017; Nadezhda Morova, Student, orcid.org/0000-0001-6380-5496, Researcher ID: C-9184-2017; Ksenia Kroo, Student; Kirillova Yulia, student, orcid.org/0000-0002-0699-8751, Researcher ID: C-7773-2017.

Manuscript Editor: Yegor Malashichev, Department of Vertebrate Zoology, Faculty of Biology, Saint Petersburg State University, Russian Federation

Received: July 19, 2016;

Revised: October 19, 2016;

Accepted: November 16, 2016;

Copyright: © 2017 Popov et al. This is an open-access article distributed under the terms of the License Agreement with Saint Petersburg State University, which permits to the authors unrestricted distribution and self-archiving free of charge.

Funding: No information have been provided.

Competing interests: The authors have declared that no competing interests exist.

Russia and some additional ones, which were devoted to some territories or some objects. Red Data books of Russia have a legislative base: special laws on them were adopted. Any activity causing reducing in number or worsening the habitats of species listed in the red books is not allowed (“on protection of environment” Law of the Russian Federation, 10.01.2002 N 7-fz).

Studying documents and official web-sites of the federal subjects of Russia, we collected information on the local Red Data books. We found out, how many books exist now, and what methodology was used therein. Afterwards we compared these methodologies with the principles of the IUCN red list, analyzing their substantiation. All-Russian Red Data book was also analyzed. We estimated how the species of the this book have been assessed on a world-wide scale, and how the IUCN recent recommendations (IUCN, 2001, 2003) have been used in Russia.

We have found out that almost all federal subjects within Russia have got Red Data books recently, or at least the lists of species, which have to be included into them. Most of the books have been published in the 2000’s. We have not found the books of only four members. Usually there are no special web-sites devoted to regional red book-keeping, but the lists of species are indicated in the documents of administrations, and the web-site for all-Russia book-keeping exists (www.sevin.ru/redbooksevin). In some regions the books have been re-edited twice. It is considered, that the lists have to be re-composed once every 10 years. Total number of books and lists studied was 140.

Results

The books are not uniform in respect to the systems of assessment categories. Early versions of the IUCN system, or similar schemes, turned out to be most widely accepted (books of 55 members of the Federation). This kind of assessment was supported by the resolution of the Russian Ministry for natural resources in the 1990s. It indicates the following categories: 0 — probably extinct, 1 — under the threat of extinction, 2 — decreasing in number, 3 — rare, 4 — uncertain (probably belonging to above, but mentioned categories do not completely conform to them), 5 — restoring. Four books either do not contain any divisions on categories of threatened species, or are in the process of formation. The other books contain their own system of categories. For example, the book of Tomskaya oblast contains an additional category “nature monument”, the book of Omskaya oblast contains a category “commercially threatened”. The books of Karelia, Saint Petersburg, and Leningradskaya oblast contain the terms of the last version of the IUCN list, but the other meaning was ascribed to them. A term “least concern” turned out especially confusing. It is used in

the IUCN list for the widespread and abundant taxa, but in these books it was used for that species, which inspire some trouble, i.e. for the threatened ones, although not so threatened than others.

None of federal subjects used IUCN recent recommendations on the application of its principles on regional scale. The same concerns all-Russian Red Data book. Quantitative assessments of the IUCN categories have not been used as well, and producing them is hardly possible because of lack of data. Most of the species have been evaluated just based on the opinion of specialists.

An objective to assess all species was not put during the work on all-Russian Red Data books. Only rare and threatened species are listed there, or at least the species which seem to be rare. In some cases the additional lists or additional categories have been introduced for the last ones. These additional lists differ from IUCN category “data deficient” (DD), because this means not only the data is deficient, but inspiring some trouble. Most of the bats represent a typical example for such cases: in some Russian territories they remain not investigated at all (for example, in Novgorodskaya oblast (Popov, 2012)), but it is widely known that they are often threatened by the lack of shelters, habitat loss, and sometimes by direct extermination.

We counted 872 species on the official web-page of the Russian Red Data book. Only 122 species of them are considered as threatened or near threatened species in the IUCN list. The others are either not evaluated (623) or considered as “least concern” (127). The opposite cases were also found, but they are not numerous: endangered freshwater bivalve *Unio crassus*, near threatened waders *Limosa limosa* and *Numenius arquata*, vulnerable noble crayfish, *Astacus astacus*, near threatened bat *Myotis dasycneme* are not included into all-Russian Red Data book. The information on them is still insufficient, the corresponding conservation studies only started recently (Kovalyov, Popov, 2011; Popov, 2015; Popov, Starikov, 2015). In some Russian territories they really turned out to be common, but we believe that they are still threatened. These cases indicate on weak links between regional and international databases.

The Russian Red Data book and followed local ones try to balance information on a whole biodiversity — that is why a majority of phylums and classes are represented there. This represents a contrast to the IUCN red list, because it does not contain some phylums at all (for example, Brachiopods and Bryozoans). That is why a majority of Russian rare species “have not yet been assessed for the IUCN Red List”.

Red Data books contain some populations, or subspecies, in addition to the species. This seems reasonable in some cases. For example, European salmonid fishes are not rare in the Russian north, but their southern populations are evidently endangered, and they are in-

cluded in the Russian Red Data book. Meanwhile some southern populations, or subspecies of these fishes, differ from northern ones significantly, i.e. they are unique, representing an interest on a global scale (Caspian salmon, *Salmo trutta caspis*, lacustrine Atlantic salmon, *Atlantico salmon m. sebago*).

Looking for the Red Data books we have found some accompanying ones: “a blue book” for endangered aquatic habitats, “green book” for rare plant communities (Samara), Red Data book of soils (Leningradskaya oblast, Belgorodskaya oblast, Volgogradskaya oblast), Red Data book on protected areas (Leningradskaya oblast, Altaiskiy kray). However this is not a common practice.

Discussion

A positive role of the IUCN list is evident, because it stimulated creation of regional Red Data books and promoted the conservative activities. However the last IUCN version of the species assessment decreased its effectiveness. Nowadays the title “The IUCN red list of threatened species” does not reflect its content because not only threatened species are listed there, but non-threatened and “near threatened” ones as well. This principle does not become acceptable. Specialists and other citizens already realized that fact, that there is a Russian Red Data book with the list of rare species, which have to be protected. Mass media popularized this for a long time, and several laws about them have been adopted. Meanwhile it is evident, that it is impossible to assess all species in the near future. Probably in some federative subjects having a small territory such an assessment will be possible, but now even the smallest territories are not enough explored. For example, only recently an endangered bivalve species freshwater pearl mussel, *Margaritifera margaritifera*, was found within the administrative borderline of Saint Petersburg (Popov, Ostrovsky, 2014). Similar discoveries or rediscoveries indicate numerous gaps in the information for the big territories.

A category “least concern” turned out to be not only unnecessary, but confusing. Since it is indicated in the “List of threatened species” many readers decided that species of this category still inspire some trouble. Confusing interpretations take place very often even in the red books. Either “least concern” category is used for threatened species, or some “least concern” species are considered rare on a global scale, because they are indicated in the IUCN red list. Moreover, according to the last version of the IUCN red list, “It is important to emphasize here that a taxon may require conservation action even if it is not listed as threatened” (IUCN, 2001. P.9). Such a comment results in additional confusion, because “The IUCN Red List’s main purpose is to highlight those species that are facing a high risk

of global extinction” (Vié et al., 2008. P.1.). Meanwhile the number of the “least concern” species is very big in the IUCN list. There are 34 943 such species, while total list consist of about 76 000 species. Many of these “least concern” species could not provoke any trouble before assessment (brown rat, *Rattus norvegicus*, house mouse, *Mus musculus*, red fox, *Vulpes vulpes*, mountain hare, *Lepus timidus*, etc.). It is not clear why such a huge work was spent for the assessment of non-threatened species. On the contrary, many species, which at least seem to be threatened (like most of the species of the Russian red book), are absent there. Such a misbalance tends to increase, because all species need updating. By 2013 17% of the species’ assessments have already been outdated (Rondinini et al., 2013).

Quantitative assessments for the IUCN categories seem to be not enough effective. This resulted in the fact, that many species of the Russian Red Data books are considered as “least concern”. Some of them are at the margin of their distribution in Russia, and are probably really “least concern”. However many species are scarcely distributed over a big area, and a significant share of their habitats is located within Russia. Total number of their representatives could be relatively big and they do not correspond criteria for the threatened or near threatened category, but they are evidently threatened (for example, big raptors), and there are no exact data for their quantitative assessment. We believe that such species cannot belong to the “least concern” category. So, a part of the least concern species are threatened and need conservation measures, the other part is non-threatened and does not need special protection. Category “near threatened” of the IUCN list also does not highlight the situation, because it is hardly possible to decide, whether they have to be specially protected or not. In the process of recent discussions on the new version of the Red Data book for Saint Petersburg, the following viewpoint was proposed (Prof. G. Noskov): local administration needs to have just the list of species which have to be protected, but not a complicated system of species’ assessment categories (the viewpoint was expressed during the meeting of commission for Saint Petersburg Red Data book keeping in 2014). Probably such a “Judgment of Solomon” will be useful on a regional scale when the Red Data book is a part of local legislation.

Our data fit the results of other studies on the use of the IUCN red list on regional scale. It could be useful for the relatively small well-studied countries or for some well-known taxa, but the assessment of big territories or scarcely studied groups always result in difficulties with its use. So, the assessment of biodiversity of Finland (Juslén et al., 2013), birds of Britain (Eaton et al., 2005) or Switzerland (Keller et al., 2005), butterflies of Flanders (Maes et al., 2012), re-assessment of 163 rare species of Asian countries (Millner-Gulland et al., 2006) did not

provoke serious disagreements with IUCN schemes. On the contrary, comparison of the IUCN list with US Endangered species act (Harris et al., 2013) or with the red lists of Brazil, Colombia, China and the Philippines (Brito et al., 2010) revealed numerous mismatches. Analysis of not well studied invertebrates showed, that IUCN criteria are not applicable for them (Cardoso et al., 2012). Study on fishes also provoked a question on some corrections of IUCN list principles (an additional category “nationally threatened” had been proposed) (Helfman, 2013). We believe that focus only on threatened species would overcome most of the contradictions between red lists. Nowadays the plan of further IUCN assessments does not contain the methodology of choice of the most urgent objects. It needs, rather, gap-analysis than increase of assessed species number.

Conclusion

To sum up, the results of our study conform to both the viewpoints cited in the introduction: IUCN still matters, but its credibility is really endangered. It works well as a slogan and database for some species, but its methodology is not effective enough.

Acknowledgements

The authors acknowledge David Fergus for the assistance in correction of the English language.

References

- Brito, D., Ambal, R. G., Brooks, T., De Silva, N., Foster, M., Hao, W., Hilton-Taylor, C., Paglia, A., Rodríguez, J. P., Rodríguez, J. V. 2010. How similar are national red lists and the IUCN Red List? *Biological Conservation* 143:1154–1158.
- Cardoso, P., Borges, P. A. V., Triantis, K. A., Ferrández, M. A., Martín, J. L. 2012. The underrepresentation and misrepresentation of invertebrates in the IUCN Red List. *Biological Conservation* 149:147–148.
- Eaton, M. A., Gregory, R. D., Noble, D. G., Robinson, J. A., Hughes, J., Procter, D., Brown, A. F., Gibbons, D. W. 2005. Regional IUCN Red Listing: the Process as Applied to Birds in the United Kingdom. *Conservation Biology* 19 (5):1557–1570.
- Editorial, 2008. The Red List still matters. *Nature* 455, 7214:707–708.
- Harris, J. B. C., Reid, J. L., Scheffers, B. R., Wanger, T. C., Sodhi, N. S., Fordham, D. A., Brook, B. W. 2013. Conserving imperiled species: a comparison of the IUCN Red List and U. S. Endangered Species Act. *Conservation Letters* 5:64–72.
- Helfman, G. S. 2013. National “versus” global red lists of imperiled fishes: why the discord? *Environ. Biol. Fish* 96:1159–1168.
- IUCN. 2001. IUCN Red List Categories and Criteria: Version 3.1. IUCN Species Survival Commission. IUCN, Gland, Switzerland and Cambridge, UK.
- IUCN. 2003. Guidelines for Application of IUCN Red List Criteria at Regional Levels: Version 3.0. IUCN Species Survival Commission. IUCN, Gland, Switzerland and Cambridge.
- Juslén, A., Hyvärinen, E., Virtanen, L. K. 2013. Application of the Red-List Index at a National Level for Multiple Species Groups. *Conservation Biology* 27, 2:398–406.
- Keller, V., Zbinden, N., Schmid, H., Volet, B. 2005. A Case Study in Applying the IUCN Regional Guidelines for National Red Lists and Justifications for their Modification. *Conservation Biology* 19 (6):1827–1834.
- Kovalyov, D., Popov, I. 2011. Annual cycle of the pond bat (*Myotis dasycneme*) spatial distribution and abundance in Saint Petersburg and Leningrad region. *Trans. Karelian centre RAS*, 68–81 (In Russian with English summary).
- Maes, D., Vanreusel, W., Jacobs, I., Berwaerts, K., Van Dyck, H. 2012. Applying IUCN Red List criteria at a small regional level: A test case with butterflies in Flanders (north Belgium). *Biological Conservation* 145:258–266.
- Millner-Gulland, E. J., Kreuzberg-Mukhina, E., Grebot, B., Ling, S., Bykova, E., Abdusalamov, I., Bekenov, A., Rdenfors, U. G. A., Hilton-Taylor, C., Salnikov, V., Stogova, L. 2006. Application of IUCN red listing criteria at the regional and national levels: a case study from Central Asia. *Biodiversity and Conservation* 15:1873–1886.
- Mrosovsky, N. 1997. IUCN's credibility critically endangered. *Nature* 389, 2, 436.
- Popov, I. 2012. K faune letichikh myshey Novgorodskoy oblasti. In: *Polevoy sezon 2011*. Veliky Novgorod; 65–68. (In Russian. “On the bats of Novgorodskaya oblast”).
- Popov, I. Yu., Ostrovsky, A. N. 2014. Survival and extinction of the southern populations of freshwater pearl mussel *Margaritifera margaritifera* in Russia (Leningradskaya and Novgorodskaya oblast). *Hydrobiologia* 735 (1):161–177.
- Popov, I. 2015. Impact of deforestation on pearl mussel habitats in the Russian section of the Baltic Sea basin. *Limnologica* 50:84–91.
- Popov, I., Starikov, D. 2015. Recent northward expansion of breeding Black-tailed Godwits *Limosa limosa* in NW Russia. *Wader Studies* 122 (3):173–183.
- Possingham, H. P., Andelman, S. J., Burgman, M. A., Medellin, R. A., Master, L. L. & Keith, D. A. 2002. Limits to the use of threatened species lists. *Trends in Ecology & Evolution* 17 (11): 503–507.
- Rondinini, C., Di Marco, M., Visconti, P., Butchart, S. H. M., Boitani, L. 2013. Update or outdate: long-term viability of the IUCN Red List. *Conservation Letters* 7 (2):126–130.
- Rodrigues, A. S. L., Pilgrim, J. D., Lamoreux, J. F., Hoffmann, M., Brooks, T. M. 2006. The value of the IUCN Red List for conservation. *Trends in Ecology and Evolution* 21 (2):71–76.
- Vié, J.-C., Hilton-Taylor, C., Pollock, C., Ragle, J., Smart, J., Stuart, S. N., Tong, R. 2008. The IUCN Red List: a key conservation tool. In: J.-C. Vié, C. Hilton-Taylor and S. N. Stuart (eds). *The 2008 Review of The IUCN Red List of Threatened Species*; 1–14. IUCN Gland, Switzerland.