

Review

Marine Endangered and Threatened Species in Russia: A Review of Current Conservation Strategies and Management Legislative Tools

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Abstract: Despite the global decline in marine species biodiversity, relatively few countries have enacted national endangered and threatened species legislation. Tailoring an adequate legislative framework with clear objectives and regulations consistent with the available scientific evidence is fundamental for the effective conservation of marine endangered and threatened species. This paper analyzes the legal framework and current institutional tools for the conservation of marine endangered and threatened species in the Russian Federation. In this regard, important legislative tools include federal laws, as well as internationally binding signed agreements, among others, such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar). A strategy and an action plan for the conservation of biological diversity were also developed. Besides, the most important tool for the conservation and protection of marine endangered and threatened species is the Red Book of the Russian Federation (RBRF) and other regional Red Books. Responsibility for causing harm to the species listed in the RBRF and their habitat is specified in the code of administrative offenses and the criminal code of the Russian Federation. Finally, conclusions and identified gaps were highlighted in the last section, including, among other things, that legislation is still limited in how it takes the impacts of climate change into account. Such type of study is highly recommended, considering the relatively few number of papers dedicated to the study of the impact and/or implications of the conservation tools and strategies mentioned in this paper on the status of the RES.

Keywords: endangered species; conservation; legislation; policy; Russia; threatened species

Key Contribution: Important conservation tools are being used in the Russian Federation for the protection of endangered and threatened species; although some gaps were identified.



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1. Introduction

Over the last decades, marine biodiversity has declined considerably as the number of marine endangered and threatened species is now higher (more species are threatened) than at any other time in recent history [1–4]. The degradation of the global marine ecosystems due to anthropogenic impacts such as pollution [5], habitat loss and degradation [6], overfishing [7], and climate change [8,9] increased the risk of extinction of many marine species. Some evaluations highlighted the high level of extinction risk in certain marine taxonomic groups, including 33% of reef-building corals [10], at least 25% of sharks and

rays [11], 16% of mangroves [12], 14% of seagrasses [13], and 11% of billfish and scombrids (e.g., tunas, bonitos, mackerels) [14]. For these reasons, great attention has been paid to the conservation and management of marine species to halt the recent decline in their abundance and diversity and to preserve the ecosystem. To reduce biodiversity loss, many attempts and conservation actions were made by conservation biologists such as species and habitat protection, ex-situ programs, removing invasive species, education and awareness campaigns, and designing adequate measures for the conservation of these species [15]. Over the last five decades, the Red List of Threatened Species of the International Union for Conservation of Nature (IUCN) has been guiding conservation endeavors as a valuable species extinction risk assessment tool. It is widely assumed that such conservation endeavors and tools have been useful in sustaining species from moving closer to extinction and driving recoveries with numerous successful cases in which species have been brought back from the brink of extinction. Lotze et al. [16] provided some examples of population and ecosystem successful cases of recoveries. Yet some studies still define a new focus of recovery and seek to present frameworks for quantifying measures of species recovery and conservation success (e.g., [17]).

Even though the conservation of marine species and ecosystems is still often portrayed as a scientific duty it is important to acknowledge that science is fundamental but, on its own, is not the only component of the decision-making process. In the end, the decision ‘to conserve’ and/or ‘to establish recovery plans’ does not depend only on science, but rather, among other things, on tailoring an adequate legislative framework with clear objectives, regulations and monitoring plans that may or may not be consistent with the available scientific evidence. Therefore, the effective conservation of marine endangered and threatened species, as a first step, depends on legislation properly designed to protect them. Similarly, achieving the objectives of these legislative tools depends on the political and social factors that affect its implementation (e.g., [18]).

Despite the global decline in marine species biodiversity, relatively few countries have enacted national endangered and threatened species legislation. The first legislative act was established in the United States, with the Endangered Species Preservation Act in 1966, the forerunner of the Endangered Species Act (ESA; passed in 1973). This was been followed by other legislative tools in some countries such as; the Biodiversity Law of Costa Rica (passed in 1992), Australia’s Endangered Species Protection Act (passed in 2002), Canada’s Species at Risk Act (SARA; also passed in 2002), also in Canada: Nova Scotia Endangered Species Act (NSES; passed in 1998), and South Africa’s National Environmental Management Biodiversity Act (passed in 2004). Several studies have evaluated the effectiveness of some of these acts for preventing the extinction of listed species, with the ESA and SARA the most evaluated acts. For example, some studies evaluated the listing, designation of critical habitat and development of recovery plans, and improvement of species’ status [19–24]. Other works have highlighted, for example, the temporal and policy-driven differences in the listing rate [25], biases in the listing of species towards particular taxonomic groups [26,27], and fluctuations in the funding allocated to ESA implementation [19]. However, recent comprehensive analysis is absent in many countries. To date, there have been limited efforts to evaluate the efficacy of similar legal frameworks in many countries, partially because these legislations often lack objective, quantifiable criteria to use in such assessments.

In Russia, particular attention has been paid to the conservation of marine endangered and threatened species. Recently in 2014, the government of the Russian Federation approved the strategy for the conservation of endangered and threatened species for the period until 2030. Despite the great importance of marine biodiversity in Russia, there are relatively few papers in this regard mostly in the Russian language [28–33]. Taking into account that little is known outside the country, this paper elucidates and analyzes the legal framework, current institutional instruments and strategies for the conservation of marine endangered and threatened species and reveals gaps in the Federal legal frameworks in the Russian Federation. We reviewed available legislation and laws to assess the current regulation practices in the country’s conservation of marine endangered and threatened

species. This would strengthen the knowledge about Russia's policy in the conservation of marine endangered and threatened species, and improve the legislation currently used as a conservation tool. In addition, the information gathered in this paper would be very important at the global level for the scientific community outside of the country given Russia's massive borders and presence on multiple shared seas (e.g., Barents Sea shared with Norway) and oceans.

2. General Methodology

This paper draws on findings from a literature review of official reports, government documents, legal reports, official governmental websites and unpublished sources relating to endangered and threatened species. The review provides the basis for a description of the key organizations, laws, decrees, objectives, and strategies that guide the conservation of endangered and threatened species. To obtain relevant data on Russian legislation, documents issued by the central Federal government, relevant ministries (e.g., Ministry of Natural Resources of Russia) and regional governments (e.g., Ministries of Natural Resources and Environment of the constituent entities of the Russian Federation) websites were reviewed. Most of the legislative documents issued in the Russian Federation are now available online on the websites of the management authorities (e.g., ministries), although mostly in Russian language. Besides, online platforms such as <https://docs.cntd.ru> and <http://www.consultant.ru> (accessed in 19 September 2022) (online platforms to disseminate many of the laws and regulations managed by the Russian government) were used. Terms in the Russian language such as 'strategy', 'law', 'regulation', 'fisheries', 'species', 'protected', 'endangered', and 'threatened' were combined and used to find and capture the main message of the relevant law articles and clauses within the collected policy and legislative documents. The detailed data analysis methodology of this study is presented in Figure 1. To answer the research questions, the review summarized the core aspects (content analysis) of each legal document and analyzed whether it provides effective protection to marine endangered and threatened species. The findings were compiled and presented in the following sections for comprehensive understanding and interpretation. Finally, conclusions and gaps identified from the review section were highlighted in the last section.

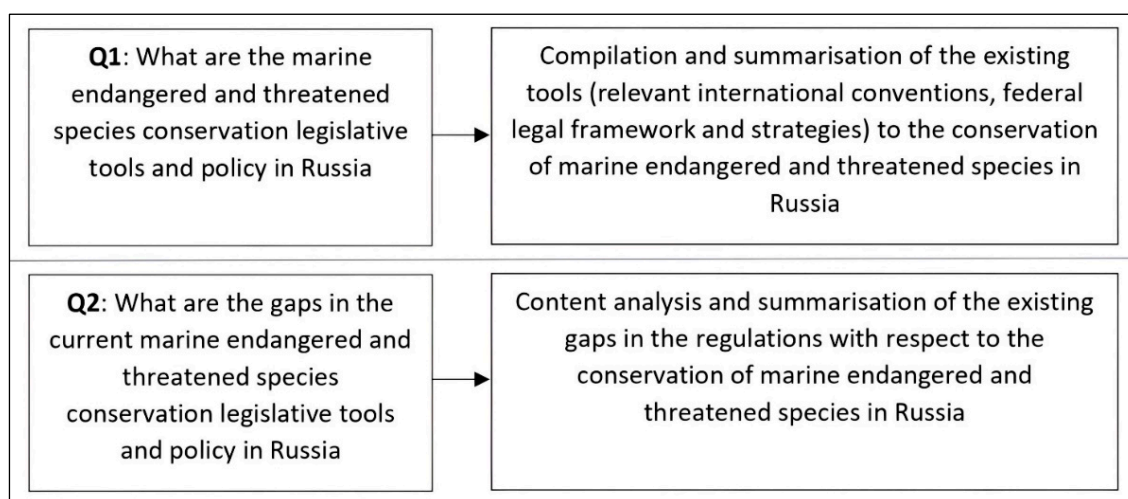


Figure 1. Schematic overview of the analysis made in this study.

3. Legal Framework for the Conservation of Endangered and Threatened Species

In the Russian Federation, the protection of endangered and threatened species (in Russian documents referred to as Rare and Endangered Species—herein after RES) is carried out within the framework of general legislation regulating the conservation of these species. The definition of “marine” or “aquatic” animals is given by the Federal Law “On fisheries

and the conservation of aquatic biological resources”. The main provisions for the protection of rare species are contained in the Federal Laws “On environmental protection” and “On the animal world”. The legal act established for the purpose of protecting and listing RES is the Red Book of the Russian Federation. The regional Red Books are also adopted by each region of the Russian Federation separately. Further, the general and special regulatory legal acts of the Russian Federation, in force at the time of writing this paper, concerning the protection of RES in general, and which are also applicable to the protection of rare and endangered marine species and birds, are summarized in the following Table 1.

Table 1. Summary of the main Federal laws (listed by the issuing year) and related articles that contain the main provisions for the protection of rare species.

Legal Framework	Year	Related Articles	Core Objective
Federal law “On the animal world” [34]	1995	Article 1	Defines the wildlife in the exclusive economic zone (EEZ) of the Russian Federation.
		Article 16	Provides the federal executive bodies the authority of supervision in the field of protection and use of wildlife and their habitats aiming at preventing, detecting, and suppressing violations in use of wildlife and their habitats.
		Article 22	Indicates that any economic activity must take measures to preserve the habitat of wildlife and the conditions for their reproduction, feeding, rest and migration routes, and any change of these must be carried out in compliance with the requirements that ensure the protection of the animal world.
		Article 24	Regulates the procedure for including RES in the Red Book of the Russian Federation [35] and/or the regional Red Books.
Federal law “On specially protected natural areas” [36]	1995	Article 1	Defines Specially Protected Natural Areas (SPNA).
		In general	This law determines the status and categories of SPNA, the procedure for their creation and the regime of special protection.
Federal law No. 7-FZ “On environmental protection” [37]	2002	Article 3	Lists the conservation of biological diversity among the basic principles of environmental conservation.
		Article 60	Sets the Red Book of the Russian Federation [35] and the regional Red Books as the main tools for the protection and record of RES and prohibits any activity leads to its withdrawal or reduction.
Federal law No. 166-FZ “On fishing and conservation of aquatic biological resources” [38]	2004	Article 27	Prohibits the extraction of RES of aquatic biological resources (ABR).
		Article 50.1	States that the protection of RES of ABR is carried out in accordance with the Federal Law of January 10, 2002 No. 7-FZ “On environmental protection” and this Federal Law.

4. National Strategies for Biodiversity and RES Conservation

In accordance with the Decree of the President of the Russian Federation of April 19, 2017 N 176 “On the Strategy for the Environmental Security of the Russian Federation for the period up to 2025”, the conservation of biological diversity is the main activity of Russia in the development of international cooperation to preserve, protect and restore the Earth’s ecosystems [39].

The first national strategy for the conservation of biological diversity in Russia was adopted in 2001, and its main goal was formulated as follows: “Conservation of the biodiversity of natural biosystems at a level that ensures their sustainable existence and sustainable use”. The provisions of the Strategy corresponded to the main provisions of the international agreement—the Convention on Biological Diversity. In 2010, the 10th Conference of the Parties to the Convention on Biological Diversity approved the Strategic Plan for the Conservation and Sustainable Use of Biodiversity for 2011–2020 and the Aichi Biodiversity Targets (Decision X/2) [40]. Based on the structure of this Strategic Plan and in accordance with the Aichi Targets, national targets were justified and formulated and the Action Plan for the conservation of biological diversity of the Russian Federation (2014) was developed [41]. This strategy and action plan also includes some national targets related to marine RES such as The Global Target 6 (sustainable harvesting of aquatic biological resources, reducing adverse impacts on threatened species and vulnerable ecosystems), The Global Target 10 (combating threats to the biological diversity of the seas) and The Global Target 12 (protection of endangered species). A set of indicators related to the number of different categories of protected species was provided to assess the achievement of the last objective.

In addition to the strategy for the conservation of biological diversity in Russia, a strategy for the conservation of RES of animals, plants and fungi in the Russian Federation for the period up to 2030 was developed (Decree of the Government of the Russian Federation of February 17, 2014 N 212-r “On Approval of the Conservation Strategy rare and endangered species of animals, plants and fungi in the Russian Federation until 2030”) [42]. The provisions of this strategy define the objectives and main directions of state policy and activities in the field of conservation of RES necessary to improve the efficiency of public administration in this field. The purpose of this strategy is to ensure, on a long-term basis, the conservation and restoration of RES in the interests of the sustainable development of the Russian Federation. The main measures for the conservation of RES, provided for by this Strategy, include: (1) improvement of the system of state management and supervision in the field of protection and use of all species and their habitat; (2) improvement of the regulatory legal framework; (3) ensuring the continuity and systematic maintenance, regular updating of the Red Book of the Russian Federation and the Red Books of the constituent entities of the Russian Federation; (4) ensuring the functioning of an effective system of SPNA; (5) creation of a single federal centre that monitors, maintains a cadastre of all animal species in the format of a multi-level information system that provides for the rapid collection and analysis of incoming information from all over the Russian Federation and the subsequent provision of this data to interested parties; (6) ensuring the fulfilment of the obligations of the Russian Federation arising from international conventions and agreements, as well as Russia’s membership in international organizations; (7) ensuring openness of information about the state of RES of animals, plants and fungi and their habitats, as well as about the measures taken for their protection and reproduction.

5. Red Book of the Russian Federation

Besides the previously mentioned laws and strategies, the most important tool for the conservation and protection of RES is the Red Book of the Russian Federation (hereinafter referred to as RBRF). It was published for the first time in August 1978, its release was timed to coincide with the opening of the XIV General Assembly of the International Union for Conservation of Nature (IUCN), held in the USSR. The latest and current edition of the RBRF was issued in 2020 and is published at least once every 10 years. The legal framework is the order of the Ministry of Natural Resources of Russia dated May 23, 2016 N 306 (as amended on 5 July 2021) “On Approval of the Procedure for Maintaining the Red Book of the Russian Federation” [43]. The RBRF is an official document containing a set of information on the state, distribution, categories of rarity status and endangered status as well as the protection measures required to ensure the conservation and recovery of RES (subspecies, populations) of wild animals, wild plants and fungi living on the territory

(including aquatic area), the continental shelf and in the exclusive economic zone of the Russian Federation [35].

Currently, the RBRF is maintained by the Ministry of Natural Resources of Russia through a specially created commission on rare and endangered animals, plants and fungi. The commission interacts with scientific organizations, including the Russian Academy of Sciences (RAS), as well as with federal executive authorities and executive authorities of the constituent entities of the Russian Federation exercising powers in the field of protection and use of wildlife, including ABR. The Ministry of Natural Resources of Russia considers proposals for inclusion into or exclusion from the RBRF or for changing the categories of the status of species received from state authorities, organizations, and citizens, and sends these proposals to the RAS and, if necessary, to other scientific organizations to obtain their opinions. After the submission of expert opinions from the RAS and/or other scientific organizations, the Ministry of Natural Resources of Russia sends them, together with the indicated proposals, to the Commission for consideration. The inclusion into or exclusion from the RBRF or for changing the categories of RES is based on the published scientific data and monitoring of these species (scientific estimates of the number of species), as well as on the degree of vulnerability and threat of reduction in its number and/or range, an increase in the fragmentation of the range, on adverse changes in the conditions for the existence of this species or other data indicating the need to adopt special measures for its conservation and restoration. After the review of the commission, the Ministry of Natural Resources of Russia places all proposals as well as supporting scientific data on its official website at least 180 calendar days before making an appropriate decision.

Species of flora and fauna listed in the RBRF include one of the rarity status categories: 0—Probably extinct, 1—Endangered, 2—Decreasing in number and/or distribution, 3—Rare, 4—Uncertain in status, 5—Recoverable and recovering. Also, one of the threat of extinction status categories characterizing their state in their natural habitat: Disappeared in the wild (EW—Extinct in the Wild), Disappeared in the Russian Federation (RE—Regionally Extinct), Critically Endangered (CR—Critically Endangered), Endangered (EN—Endangered), Vulnerable (VU—Vulnerable), Near Threatened (NT—Near Threatened), Causing the least concern (LC—Least Concern), Insufficient data (DD—Data Deficient). Finally, to one of the categories of the degree and priority of environmental measures taken and planned for adoption (nature conservation status): I priority—immediate adoption of comprehensive measures is required, including the development and implementation of a conservation strategy and/or a program for the restoration (reintroduction) of species, II priority—it is necessary to implement one or more special measures for the conservation of species, III priority—enough general measures provided for by the regulatory legal acts of the Russian Federation in the field of environmental protection, organization, protection and use of SPNA and protection and use of the animal world and its habitat, for the conservation of species listed in the RBRF.

The RBRF consists of two volumes, the first volume is devoted to animals, and the second to plants. The volume dedicated to animals consists of two parts: invertebrates and vertebrates. In turn, vertebrates are considered in six sections: lampreys, ray-finned fish, amphibians, reptiles, birds and mammals.

When it comes to fish species, in the latest edition of the Red Data Book (2021), they are represented by seven orders: sturgeons (Acipenseriformes), scads (Clupeiformes), salmon (Salmoniformes), cyprinids (Cypriniformes), cods (Gadiformes), eels (Anguilliformes) and sticklebacks (Gasterosteiformes). The most numerous protected fish species are sturgeons (nine species), salmonids (17 species, 6 subspecies, 4 populations) and cyprinids (seven species, one subspecies, two populations). Herring-like species are represented by two species, cod-like, eel-like and stickleback-like contain one species each.

Most sturgeon species have one category of rarity—a species that is on the verge of extinction and has the highest priority of conservation measures. Two species—the European (Atlantic) sturgeon (*Acipenser sturio*) and the Baltic sturgeon (*Acipenser oxyrinchus*) have a rarity category 0, that is, they belong to populations that have probably disappeared

in Russia. The rest have a second category of rarity—a species that is declining in number or distribution.

Salmonids are represented by fish of 1, 2 and 3 categories of rarity in similar proportions, which reflects their status according to the IUCN. Herrings have 2 and 3 (rare species) categories of rarity. Most cyprinids are represented by fish with the second category of rarity, that is, they are declining in number or distribution. Cod-like and eel-like are the first category of rarity, and stickle-like—the second.

Thus, fish listed in the RBRF are represented by species with a variety of types of aquatic habitats: from rivers and lakes to marine areas. On the other hand, Regional Red Data Books have a greater number of fish species, depending on the status of their populations in the territories of a particular subject of the Russian Federation.

Species listed in the RBRF are completely withdrawn from economic use. Removal from nature is allowed only with the permission of specially authorized state bodies and only in special cases (see Section 9: Exceptions to restriction on harvesting RES). Fees and methods of calculation for accidental or intentional damage caused to them and their habitats have been approved for almost all RBRF species.

6. International Agreements for the Protection of Aquatic RESs and Birds

The Russian Federation signed a number of international conventions and framework agreements for the protection of RES of ABR and birds (summarized later in Table 3).

7. Federal State Supervision in the Field of Protection of RES

The main federal government agencies for the protection, control, and regulation of the use of wildlife and their habitats in the Russian Federation are the Federal Service for Supervision of Natural Resources (Rosprirodnadzor) and the border agencies of the Federal Security Service of the Russian Federation.

The powers to protect RES are vested in the Federal Service for Supervision of Natural Resources (Rosprirodnadzor) (in relation to the RBRF) and the subjects of the Russian Federation (in relation to regional Red Books). For example, the Far Eastern Interregional Directorate of Rosprirodnadzor exercises the following powers: (1) federal state control (supervision) in the field of protection, reproduction and use of wildlife and their habitats in SPNA of federal significance that are not under the control of federal state budgetary institutions; (2) federal state control (supervision) in the field of protection and use of SPNA in areas of federal significance and within the boundaries of their protected areas that are not under the control of federal state budgetary institutions; (3) federal state control (supervision) in the field of handling animals, with the exception of handling service animals, in terms of compliance with the requirements for the maintenance and use of wild animals kept or used in captivity, including those belonging to species listed in the RBRF and/or protected by international treaties of the Russian Federation (with the exception of compliance with the requirements for the maintenance and use of such animals for cultural and entertainment purposes); (4) protection of ABR listed in the RBRF, with the exception of ABR located in SPNA of federal significance.

In addition, Federal state control (supervision) in the field of fisheries and the conservation of marine ABR is carried out by the border agencies of the Federal Security Service of the Russian Federation. General supervision over the implementation of legislation is carried out by the prosecutor's office.

8. Liability for the Damage Caused to RES

Responsibility for causing harm to species listed in the RBRF and their habitats is described in Article 8.35 of the code of administrative offenses of the Russian Federation: "Destruction of rare and endangered species of animals or plants" [44] (Table 2). It is also specified in Article 259 of the criminal code of the Russian Federation: "Destruction of critical habitats for organisms listed in the Red Book of the Russian Federation" [45] (Table 2). In addition, Article 258.1 of the criminal code of the Russian Federation provides for separate

liability for the illegal extraction and trafficking of especially valuable wild animals and ABR belonging to species listed in the RBRF and/or protected by international treaties of the Russian Federation. The list of such species is established by a Decree of the Government of the Russian Federation of October 31, 2013 N 978 which also includes anadromous fish species, including Atlantic sturgeon (*Acipenser sturio*), kaluga (*Huso dauricus*), Sakhalin sturgeon (*Acipenser mikadoi*), and Sakhalin taimen (*Parahucho perryi*).

Table 2. Summary of the main legal tools related to the responsibility for causing harm to species listed in the RBRF and their habitats and the corresponding sanctions.

Legal Framework	Article	Actions	Author	Sanction/Fine
Code of administrative offenses of the Russian Federation	Article 8.35	Actions (inaction) that can lead to death, reduction in the number of RES listed in the RBRF or violation of their habitats. Also, extraction, storage, transportation, collection, maintenance, sale or transfer of RES, their products, parts, or derivatives without a proper permit.	Citizens	Administrative fine: 2500 to 5000 rubles with or without confiscation of tools.
			Officials	Administrative fine: 15,000 to 20,000 rubles with or without confiscation of tools
			Legal entities	Administrative fine: 500,000 to 1 million rubles with or without confiscation of tools
Criminal code of the Russian Federation	Article 258.1	Illegal extraction and trafficking of RES listed in the RBRF and/or protected by international treaties of the Russian Federation		Fine: 300,000 to 500,000 rubles or in the amount of the wage or other income of the convicted person for a period of two to three years.
	Article 259	Destruction of critical habitats for RES listed in the RBRF, which cause the extinction of their populations.		Compulsory labor: from four hundred and eighty hours to three years. Prison: up to three years.

Illegal production, maintenance, acquisition, storage, transportation, shipment and sale of especially valuable wild animals and ABR belonging to species listed in the RBRF and/or protected by international treaties of the Russian Federation, their parts and derivatives, are punished by compulsory, corrective or forced labor with a fine up to imprisonment. Similar actions committed using the mass media or the internet, or by a person using his official position; either with a public demonstration, or by a group of persons by prior agreement or by an organized group, lead to stricter criminal liability.

To sum up all the previously mentioned tools, apart from the Federal laws (mentioned in Table 1), Table 3 summarizes the main Federal conservation tools and international agreements and conventions for the protection of rare species.

Table 3. Summary of the main Federal conservation tools and international agreements and conventions for the protection of rare species.

Scope	Category	Legal Framework	Year	Core Objective
National Conservation tools	Strategy for the conservation of RES for 2030	Decree of February 17, 2014 N 212-r	2014	To ensure, on a long-term basis, the conservation and restoration of RES of animals, plants and fungi in the interests of the sustainable development of the Russian Federation.
	Strategy for the Environmental Security of the Russian Federation for the period up to 2025	Decree of April 19, 2017 N 176	2017	Includes some national targets related to marine RES (e.g., the Global Targets 6, 10 and 12).
	Red Book of the Russian Federation	Order of the Ministry of Natural Resources, May 23, 2016 N 306 (as amended on 5 July 2021)	2021	The official document containing a set of information on the state, distribution, categories of rarity status and endangered status as well as the protection measures required to ensure the conservation and recovery of RES in the EEZ of the Russian Federation.
	Liability for the damage caused to RES	Article 8.35 of the code of administrative offenses Article 259 and Article 258.1 of the criminal code of the Russian Federation		Sanctions for causing harm to species listed in the RBRF and their habitats. Sanctions and penalties for causing harm to species listed in the RBRF and their habitats.
International agreements and conventions for the protection of aquatic RESs and birds	Convention on Wetlands of International Importance, Mainly as a Habitat for Waterfowl (Ramsar)		1971	Conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world
	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)		1973	To ensure that international trade in specimens of wild animals and plants does not threaten the survival of the species
	Convention on the Conservation of Migratory Species of Wild Animals (CMS)		1979	Provides a global platform for the conservation and sustainable use of migratory animals and their habitats
	Framework Convention for the Protection of the Marine Environment of the Caspian Sea (Tehran convention)		2003	Lays down the general requirements and the institutional mechanism for environmental protection in the Caspian region.

9. Exceptions to Restriction on Harvesting RES

In exceptional cases, the legislation of the Russian Federation allows the extraction of rare species of ABR. The resolution of the Decree of the Russian government of December 24, 2008 N 1017 “On the extraction (catch) of rare and endangered species of aquatic biological

resources" together with the "Rules for the extraction (catch) rare and endangered species of aquatic biological resources", among other things, concerns species listed in the RBRF [46]. According to this resolution, the extraction of rare species of ABR is allowed for the following purposes: (1) conservation of ABR; (2) monitoring the state of their populations; (3) implementation of their artificial reproduction or acclimatization; (4) ensuring the maintenance of a traditional way of life and the implementation of traditional economic activities of the indigenous peoples of the North, Siberia and the Far East of the Russian Federation.

It should be noted that the extraction of the RES of ABR listed in the RBRF is carried out on the basis of permits issued by the Federal Service for Supervision of Natural Resources in the manner determined by the Ministry of Natural Resources and Ecology of the Russian Federation. Meanwhile, the other RES of ABR (i.e., not listed in the RBRF) such extraction is carried out on the basis of permits issued by the Federal Fisheries Agency. The rules establish that the tools, gears and methods used for the extraction of rare ABR should not cause damage to the natural populations of these ABR and their habitat. Also, the tools, gears and methods of extraction used must be selective and in the case of harvesting marine mammals in a living form, to reduce the possibility of causing them any physical and mental trauma. The control over compliance with these rules is carried out by both the Federal Service for Supervision of Natural Resources and the Federal Agency for Fisheries.

10. Conclusions and Identified Gaps

This is the first attempt to summarize the main legislative tools and policies related to endangered and threatened species in the Russian Federation. Marine legislation has been developing for many decades and is the key means by which the conservation and protection of marine biodiversity including endangered and threatened species is achieved. In addition, recently an increasing focus on 'holistic' policy development is evident (e.g., strategy and action plan for the conservation of biological diversity of the Russian Federation) compared with earlier 'piecemeal' sectoral approaches. Important marine legislative tools being used in the Russian Federation for the protection and conservation of endangered and threatened species, including Federal laws "On fishing and conservation of aquatic biological resources", "On environmental protection" and "On the animal world", as well as internationally binding signed agreements, among others, such as CITES and Ramsar. Besides the previously mentioned laws and strategies, the most important tool for the conservation and protection of marine endangered and threatened species is the RBRF and other regional Red Books. Responsibility for causing harm to the species listed in the RBRF and their habitat is specified in the code of administrative offenses and also the criminal code of the Russian Federation.

Some studies are devoted to comparing the effectiveness of the existing regional, national and international Red Books and red lists on the example of certain regions of the Russian Federation (e.g., [47,48]). For example, a comparative analysis of the Red Books and red lists applicable in St. Petersburg and its district showed that currently, these official documents are so different from each other that it can be difficult to combine them into one database. It was shown that in some cases the conservation status turns out to be purely formal, while in reality red-listed species are not always properly protected from the negative impacts of human activities. It is necessary to bring into a single system the conceptual gradation of categories of rarity vulnerability of the protected species and to define clear rules for compiling their lists. The general unification of red lists could significantly increase the effectiveness of the decision-making process in the field of the protection of rare and endangered species [48].

Most of the relevant Russian scientific literature in the last 15 years, is focused on the review of the distribution and dynamic of RES in Russian waters (e.g., at the regional level [49–52]) and/or proposals for the inclusion of some species in the upcoming edition of the RBRF (e.g., [53,54]). However, there are very limited studies that analyzed the impact or implications of the conservation tools and strategies (e.g., SNPA or RBRF) mentioned in this paper on the status of the RES. For example, Sereda (2016) presented how the Taganay

National Park contributes to the study of RES included in the Red Book of the Chelyabinsk Region, providing some examples of fish species, including grayling *Thymallus thymallus*, brown trout *Salmo trutta*, Siberian taimen *Hucho taimen*, European bullhead *Cottus gobio* [55]. Similarly, Dolganov and Tyurin (2014) provided information on the Far Eastern Marine Biosphere Reserve in Peter the Great Bay, Sea of Japan, indicating that about 500 vertebrates, among them 184 fish species were recorded in the reserve and highlighting that, over the last 20 years, the number of fish species was increased about 14 species [56]. Another example of analyzing some of the mentioned conservation tools is Zhevlakov's (2014) article which analyzed the problems of the legislative structure and application of Art. 258.1 of the Criminal Code of the Russian Federation about the illegal harvesting and trafficking of RES listed in the RBRF [57]. The author draws his conclusions and makes suggestions to improve this Article and its practical application, differentiating between similar administrative offenses. Such a type of study is highly recommended, considering the relatively few number of papers dedicated to the study of the impact or implications of the conservation tools and strategies mentioned in this paper on the status of the RES.

This review also showed a number of gaps and issues in the legislation related to the protection of RES in Russia. One of the main identified gaps is that the legal status of protection of species listed in the RBRF does not depend on the categories of rarity established for them in the RBRF itself. The national legislation does not provide for the differentiation of the level of protection of species and their habitats listed in the RBRF on the grounds of their rarity and specific threats of extinction: whether the species is endangered or relatively safe and recovering, their degree of protection is the same, and additional conservation measures for more endangered species are not envisaged. The very inclusion of species in the RBRF is one of the legal formalizing signs of rare or endangered species (subspecies, populations), as species of legal protection, formally separated from all other representatives of the animal and plant world.

Another issue was identified in Article 60 of the Federal Law "On environmental protection" which is very declarative and explicitly only prohibits any economic use of species listed in the Red Books and any activity that leads to a reduction in their numbers and worsens their habitat. However, laws themselves make exceptions to these cases and allow the harvesting of species listed in RBRF in order to conserve ABR; monitoring the state of their populations; their artificial reproduction or acclimatization; conducting a traditional way of life and traditional economic activities of indigenous peoples. Sometimes this may hide the economic use of RES that does not comply with the law, which requires a more precise specification of such exceptional cases not only in relation to the extraction but also the circulation of rare species.

The third issue is related to the procedures for the protection of endangered and threatened species. Up to date, part 2 of article 60 of the Federal law "On environmental protection" provides for the protection of rare and endangered plants, animals, and other organisms and for preserving their genetic fund in cryobanks and in artificially created habitats, but the procedure for these processes has not yet been developed and approved, which reduces the effectiveness of the protection of species listed in the RBRF.

Finally, the review of key legislation relevant to the protection of endangered and threatened species in the Russian Federation shows that climate change was not considered in the drafting of the legislation. Despite the huge increase in knowledge of climate change impacts in recent decades, legislation is still limited in how it takes these impacts into account when it comes to protecting endangered and threatened species. There is scope, however, to account for climate change impacts on the endangered and threatened species provided in the Global Target 10 of the strategy and action plan for the conservation of biological diversity of the Russian Federation. In order for policymakers to be able to consider climate change in developing new legislation, or in amending or implementing current legislation, there needs to be an effective information flow between the scientific community and policymakers.

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