

Approaches to Resource Assessment of Bird Use Potential in the Republic of Tatarstan

*Ilgizar Rakhimov**, *Nikita Ignashev*, and *Marat Zainullin*

Kazan (Volga Region) Federal University, 420008, Kazan, Russia

Abstract. The preservation of biodiversity of rare and endangered birds in natural and anthropogenic landscapes of the Republic of Tatarstan (RT) is becoming an important issue in the modern nature conservation activities. To date, there is no real resource assessment of the potential of using the representatives of the Red Book of the living world, namely birds. In this regard, this article presents the approaches to the selection of criteria for their assessment, based on the legislative acts, orders, articles and methods for calculating the harm caused to the wildlife of the Russian Federation (RF).

1 Introduction

The successful conservation of the bird biodiversity depends in part on an accurate assessment of the diversity to be conserved. The birds are among the most conspicuous members of the wildlife, and their habitat is not limited to the wild environments. Some of them are capable of living with various interspecific relationships in almost all natural areas, including the urbanized landscapes.

The large-scale population declines have been noted for many animals around the world, including birds [1]. However, there are differences in the direction and magnitude of changes in individual species. Many publications provide little indication of what characteristics of species are associated with such trends. Therefore, the predicting the relative risks of extinction of the Red-Book bird species is an urgent task for individual species conservation practices. The potential use of birds within any region is not limited to the rare species. This includes the hunting, involuntary keeping of wild species, regulation of the number of individual synanthropic bird species, and the accidental destruction of birds. The international trade in species occupies a special place. All of these can cause the risks to birds.

2 Results and Discussion

The identification of ecological and behavioral traits associated with the reduction and extinction of species helps to understand the main priorities of conservation research and the development of fauna management strategies [2]. The total ornithofauna in the Republic of Tatarstan includes 306 bird species, 68 of which are included in the Red Book of the Republic of Tatarstan. A total of 3 editions of the Red Book have been issued in the RT, with constant

* Corresponding author: rakhim56@mail.ru

adjustments due to the changes in the nature conservation status and rarity categories of species. The degree of biodiversity in an ecosystem depends largely on the heterogeneity of the landscape and the diversity of interspecific relationships between community members. It should be noted that each region has its own peculiarities of bird distribution in its territory. A rare species in one region may be a numerous species in another region.

The need to develop the biodiversity indicators has arisen within the framework of measures for the conservation of the region's fauna [3,4,5]. However, there is no universal method for assessing the biodiversity of any region and for any species yet. The assessment of bird biodiversity should be based on already available data on flora, fauna and landscape ecology. In this regard, it is necessary to supplement the existing methods, taking into account the external and internal factors of interaction on the birds.

The coordination mechanisms for the conservation of the biodiversity in the Russian Federation are assigned to the agencies and institutions which aim to develop the regulations for the conservation of the base of rare and endangered wildlife species, oversee the national and federal projects and regulate the management of specially protected natural areas (SPNAs). To date, the value of the species has been determined by assessing the damage caused to them and on the basis of the minimum wage (MW). The methodology is stated in the Federal Law No. 107 dated April 28, 2008 On approval of the methodology for calculating the damage caused to the wildlife species included in the Red Book of the Russian Federation, as well as other wildlife species not related to hunting and fishing objects and their habitats. The above Order includes annexes 1,2, which round up the value of the species to a whole number and take as a basis the certain representatives of orders, but not species. The methodology greatly underestimates the real value of the species. The value indicator only determines the economic component of the species, but does not assess the ecological component.

Currently, one of the areas of animal control is the *Convention on International Trade in Endangered Species of Wild Fauna and Flora*. The reason for the creation of this Convention was the fight against the illicit trade in wildlife and the strengthening of conservation activities at the international level [6]. The Russian Federation became a party to the Convention in 1992, in connection with this it strengthens the legal basis and bears the responsibility in the publication and maintenance of the Red Book, protection of certain rare species on the rules prescribed in the Convention [7]. A large turnover of illegal *goods* of rare and endangered bird species occurs in Russia. To date, the fines and methods prescribed in the legislative acts of the Russian Federation do not take into account the additional criteria for assessing and calculating the amount of fine for the illegal removal and destruction of wildlife objects. The damage is assessed on the basis of the Federal law No. 209-ФЗ dated July 24, 2009 (revised at November 4, 2022) *On Hunting and Conservation of Hunting Resources and on Amendments to Certain Legislative Acts of the Russian Federation*, Order of the Ministry of Natural Resources and Environment of the Russian Federation No. 948 dated December 8, 2011 (revised at November 17, 2017) *On Approval of Methods of Calculation of the Damage Caused to Hunting Resources*. The damage caused to the hunting resources is compensated in accordance with the Federal Law *On Wildlife*, rates and methods for calculating the damage to wildlife, etc. [8]. The above-mentioned methodologies determine the extent of liability, depending on the severity of the damage caused to the wildlife, which results in the penalties and criminal liability. A mathematical formula is used to determine the amount of damage, affecting the population figures, the amount of damage caused in habitats and nesting areas.

These documents provide the legal protection for wildlife. However, in the context of regional nature conservation, more specific estimates of the value of a particular species are required. An example of incorrect penal survey is a nesting, Red Book bird species in the Republic of Tatarstan: Osprey - its value according to the methodology is determined at 25,000 thousand rubles, but its abundance, average life expectancy, sustainability of habitat in synanthropic landscapes, cost of breeding the species in captivity, etc. are not assessed. If the

above-mentioned indicators are assessed, the value of the species' biodiversity will increase significantly.

Predicting the relative risks of animal extinction has become a major challenge in biodiversity conservation. Identifying the ecological traits associated with the species declines that cause the population declines and setting the priorities for conservation actions. Another potential problem is that only a small number of traits are usually considered, whereas the total number of traits that have been identified as affecting the population change or extinction is quite large [8]. Some conservation objectives require the economic evaluation of species not only used in hunting or rare ones from the Red Book, but also other representatives of ornithofauna that are not economically important. At present, any species can, under the influence of any factor, become rare in a short time

Therefore, there is a need to supplement and improve the existing measures in the fight for species survival. It is necessary to develop different criteria and assessments based on various specific aspects of birds (productive capacity of the individual, costs of maintaining and restoring the individual, age characteristics of the individual). The fines for the removal and destruction of economically important species in order to preserve the populations are not stipulated by laws, because the ecological component is not evaluated. It is impossible to reflect the real cost estimate of the bird species included in the Red Book of the Republic of Tatarstan and the Russian Federation, relying only on the existing legislation and fines.

The improvement of this methodology will strengthen the existing measures in the fight for the conservation and survival of the species. There is a need to assess not only the Red Book and hunting species but also other representatives of the ornithofauna (synanthropic, etc.). The species may change their rank depending on the measures taken to influence their protection. The penalties for destruction and taking of the economically important species are not foreseen by the current conservation legislation. On this basis, it is possible to propose the indicators that would complement and improve the fines and fees for the destruction and removal of species from the wildlife. [9].

It is proposed to introduce a number of indicators, criteria in determining the real value of the species and the fine for its seizure and destruction.

Each species inhabiting the territory of the Republic of Tatarstan will be evaluated according to the ecological criteria:

1. The protected status of the species, its listing in the Red Books at the regional (5 points), federal (10 points) and world level (list of the International Union for Conservation of Nature) (15 points);
2. Sexuality of the bird (female - 10 points, male - 5 points);
3. Ecological component (nature of nesting, sedentary, colonial, etc.) (from 1-10 points depending on the habitat in the Republic of Tatarstan);
4. Annual productivity of the species (average number of eggs laid per season from 1-10 points, the more eggs the lower the score);
5. Synanthropy of the species (resistance to inhabiting and nesting in the urbanised areas. From 1-10 points, the classic synanthropist gets the lowest score);
6. Age (chick or adult bird), (the younger the individual, the higher its score. From 1-10 points);
7. Approximate species abundance (from 1-10 points, the lower the abundance, the higher the point)
8. Average life expectancy of the specie (the longer the bird lives, the higher its score. From 1-10 points)
9. Potential for human use (hunting resource, non-hunting resource, captive keeping, etc.) (if the species is a classic game species, its value is lower, from 1-10 points).

Each criterion will represent a rating scale of significance for ecological indicators from 1 to 10 points. For the abundance, age and sex criteria, this experimental scale can be reduced to 5

points. As basis for economic evaluation of the species the existing minimum fee for killing and taking of birds from wildlife from Annex 2, Order of the Ministry of Nature of Russia No. 429 dated December 12, 2012, in the amount of 1,000 rubles, was taken. Accordingly, 1 point will be equal to 1,000 thousand rubles. The above mentioned species can be taken as an example of calculation: Osprey - according to the ecological scale, a female species scores 67 points, and a male species scores 62 points, it follows that the value of the female is 67,000 rubles, and the value of the male is 62,000 rubles. The value with the ecological score is higher than the existing value.

3 Conclusions.

Using all these approaches, it becomes possible to assess the real situation of populations in a particular region of each bird species. This will allow us to adjust our approaches to the compilation of regional Red Books and will serve as a basis for the removal of a number of species from the list of rare birds.

These scales are being developed and will be used in assessing the resource potential of birds in the Republic of Tatarstan and can be applied in other regions.

References

1. C.Both, S.Bouwhuis, C.M.Lessells, M.E.Visser, *Nature*, **441**, 81-83 (2006)
2. D.O. Owens Fisher. *Trends Ecol*, **19**, 391-398 (2004)
3. Order of the Ministry of Natural Resources and Environment of the Russian Federation No. 107 dated April 28, 2008 On Approval of Methods of Calculation of the Damage Caused to Wildlife Listed in the Red Book of the Russian Federation, as well as other Wildlife Species not Related to the Objects of Hunting and Fishing and their Habitats (2008)
4. Decree of the Cabinet of Ministers of the Republic of Tatarstan No. 520 dated July 24, 2009 On Approval of State Register of Specially Protected Natural Territories in the Republic of Tatarstan and Amending Certain Decrees of the Cabinet of Ministers of the Republic of Tatarstan on Specially Protected Natural Territories (2009)
5. P.F Donald, F.J.Sanderson, I.J.Burfield, S.M.Bierman, R.D.Gregory, Z.Waliczky. *Science*, **317**, 810-813 (2007)
6. V.E. Flint. *Strategy and Preservation of Rare Species in Russia: Theory and Practice*. (Moscow, 2002)
7. Convention on International Trade in Endangered Species of Wild Fauna and Flora, Geneva (2019)
8. State Report on the State of Natural Resources and Environmental Protection of the Republic of Tatarstan in 2021, Kazan (2022)
9. I.I. Rakhimov. In: *Bulletin of Kazan Law Institute of the Ministry of Internal Affairs of the Russian Federation*. (Kazan, 2012)