

## ON THE ASSESSMENT OF THE EFFECTIVENESS OF THE CONSERVATION OF RED DATA INSECT SPECIES IN THE PROTECTED NATURAL TERRITORIES IN BELARUS AND VIETNAM

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**Abstract.** The study was carried out to find the approaches to the assessment of the conservation effectiveness of Red Data insect species in the especially protected natural territories in Belarus (East Europe) and Vietnam (Southeast Asia). A review of the structure of a modern system of protected areas in both countries is provided. The structure is similar and includes the national parks, nature reserves, the special protected areas, and a few other categories of protected areas like, for example, scientific and experimental forest areas in Vietnam. The total number of the protected territories is many times higher in Belarus than in Vietnam – 1,285 versus 164, although the area of the protected territories in both countries is different, as well as a total area of the countries. The lesson of the criteria to assess the conservation effectiveness of Red Data insect species in the especially protected natural territories is very difficult because their multiplicity and different interpretations. We tried to use the only criterion of presence of the Red Data species in the protected areas. The nature reserves, national parks and 5 the largest special protected territories (zakaznik) were analysed in this way in Belarus. In Belarus, the effectiveness of the protected areas according to this criterion is very high because: 1). More than 80 % of Red Data species are presented in the protected areas, 2). There are at least three Red Data species inhabited every territory and 3). There are species presented almost exclusively in the protected territories. There is a problem to use this criterion in Vietnam because of the poor knowledge of the regional biodiversity and the local faunas, existing of the large number of the endemics and undescribed species, as well as the rarity of many species. Some problems of the conservation of Red Data insect species in the especially protected natural territories are outlined.

**Keywords:** Insecta, Red Data species, especially protected natural territories, Belarus, Vietnam.

**Rezumat. Asupra evaluării eficacității conservării datelor/listelor roșii de insecte speciale în teritoriile naturale protejate în special în Belarus și Vietnam.** Studiul a fost realizat pentru a găsi abordările pentru evaluarea eficacității de conservare a speciilor de insecte Red Data în teritoriile naturale în special protejate din Belarus și Vietnam (Asia de Sud-Est). Este prezentată revizuirea structurii unui sistem modern de arii protejate din ambele țări. Structura este similară și include parcurile naționale, rezervațiile naturale, zonele protejate speciale și alte câteva categorii de arii protejate precum, de exemplu, zonele forestiere științifice și experimentale din Vietnam. Numărul total al teritoriilor protejate este de multe ori mai mare în Belarus decât în Vietnam – 1.285 față de 164, deși suprafața teritoriilor protejate din ambele țări este diferită, precum și o suprafață totală a țărilor. Selectarea criteriilor pentru evaluarea eficacității conservării speciilor de insecte Red Data în teritoriile naturale protejate este foarte dificilă, deoarece multiplicitatea lor și interpretările diferite. Am încercat să folosim singurul criteriu de prezență a speciilor Red Data în zonele protejate. Rezervele naturale, parcurile naționale și cele 5 cele mai mari teritorii speciale protejate (zakaznik) au fost analizate în acest fel în Belarus. În Belarus, eficacitatea zonelor protejate conform acestui criteriu este foarte mare, deoarece 1) peste 80% din speciile din Lista Roșie sunt prezentate în zonele protejate, 2) există cel puțin trei specii din Lista Roșie locuite în fiecare teritoriu și 3) acolo sunt specii prezentate aproape exclusiv pe teritoriile protejate. Există problema utilizării acestui criteriu în Vietnam, din cauza cunoștințelor slabe despre biodiversitatea regională și faunele locale, care există din numărul mare de endemice și specii nedescrise, precum și din raritatea multor specii. Sunt prezentate câteva probleme ale conservării speciilor de insecte Red Data în teritoriile naturale protejate în special.

**Cuvinte cheie:** Insecta, specii din Lista Roșie, în special teritorii naturale protejate, Belarus, Vietnam.

### INTRODUCTION

The problem of representativeness and effectiveness of the protected areas becomes the mainstream not only in the South-East Asia region but also in the Europe where effectiveness of the nature protection in the protected areas is sufficiently high. It was shown in the South-East Asia that the individual distribution models of biodiversity characterize the majority of the animal taxa. Most “hotspots” of biodiversity do not match to the protected territories. For certain taxa it was shown that above 55 % of territory with about 75 % of taxon diversity does not protected (HUGHES, 2017). Different strategies of multifunctional utilization of the tropical forest landscape were assessed (LAW et al., 2017). It was shown on the example of the forest landscapes in Indonesia that reserving of 29-37 % of territory for the nature protection is enough for biodiversity protection in the forests.

Methodical approaches were developed to select ecologically valuable territories that could be used for landscape planning and for conservation in North Europe and were tested in East Finland (KANGAS et al., 2016). To develop the models of landscape planning, large ecological data arrays were used but developed models have substantial limitations.

Thus, today, research is focused on new approaches to the conservation of the biodiversity. Reassessment of the role of protected areas, finding of more effective ways for management and functioning of the protected areas, search of compromise between the conservation efforts and interest of the local communities occur today.

## MATERIAL AND METHODS

We carried out a comparative analysis of the current system of the protected territories in Belarus and Vietnam relying on the official information from open sources. The number and structure of the especially protected natural territories were compared in both countries.

The selection of the criteria to assess the conservation effectiveness of Red Data insect species in the especially protected natural territories is very difficult because of their multiplicity and different interpretations. We tried to use only the criterion of the presence of the Red Data species in the protected areas. This criterion undoubtedly has many restrictions. Using of the indicator species often does not allow to compare them informatively with the other taxa; therefore we need the multispecies approach to determine the conservation priorities then the further development of the approaches oriented on the separate taxon (HUGHES, 2017). Often ecological models have been criticized for a naive approach to model development and a lack of strictness in evaluation; but a more ecological emphasis based on expert knowledge can facilitate the development of a more accurate and relevant analysis of biodiversity based on accurate data on a species level (SEARCY & SHAFFER, 2016). Using of the multispecies approach with consideration for the ecological factors may be very useful for the selection of the valuable habitats for conservation. Such approaches were developed for one beetle family – rove-beetles – and they were successfully tested in the riverine ecosystems in the Great Britain (EYRE et al., 2001). The problem of criteria choice for assessment of the effectiveness of the protected areas is very important. The plots with traditional farming systems in national parks are the most valuable natural habitats in the mountain districts in the Mediterranean region in Europe (CIMINI et al., 2013). Shrub and forest expansion may cause more substantial loss of the local biodiversity in comparison with forest plots degradation. Habitat mosaic in this region is critical for sustaining of the high level of the local biodiversity.

Nevertheless, the use of Red Data insect species is more understandable for the wide circle of scientific experts and for public. It is the simplest way to assess the value of the natural protected territory. Obviously, it is impossible to protect the rare species without protection of their habitats. But the rare and vulnerable species indicate the vulnerable habitats and help focus the attention of the nature conservation organizations on targeted habitats for their protection. This habitat-based approach was applied in the latest edition of the Red Book of the Republic of Belarus (2015).

To assess the presence of Red Data insect species in the protected territories in Belarus we selected the Berezinsky biosphere reserve, national parks and 5 of the most important “zakazniks”. The significance of the zakazniks as protected territories was estimated on such features as the total square, diversity of the ecosystems, plants and animals in their territory (YURGENSON et al., 2017; \*\*\*. ESPECIALLY PROTECTED, 2019; \*\*\*. 8 LARGEST BOGS, 2019). The list of insect species included in Vietnamese Red Book was analysed on the distribution of the species, category of protection and on the presence in the protected territories.

## RESULTS AND DISCUSSIONS

The good practice of organization of the protected territories was accumulated in both countries, although there are the specific characters in each country determined by the physiographic peculiarities of the region and by the fauna structure.

There are four categories of especially protected natural territories in the Republic of Belarus – natural reserve, national park, “zakaznik” and natural landmark. The territories are different in their status of protection and use, governed by a special system of laws and regulations. The natural reserve is considered to be most effective as a protected territory because the reserve is established with the goals of protection and study of etalon ecosystems and other valuable natural complexes and objects, animal and plant world, natural ecological systems and landscapes, arrangement of conditions providing the natural course of the nature processes. Any economic activity is prohibited in the natural reserve if this activity affects natural processes.

The national parks are established with the goal of protection of the etalon ecosystems and other valuable natural complexes and objects, their use in the course of nature protection, scientific, educational, touristic, recreational and health-improving activities. A few zones are marked out within the borders of the national park depending on their functional load.

The most important zone for the protection of biodiversity is a specially reserved zone, meant for the protection of the nature complexes and objects in the natural conditions, providing with conditions of their development, within whose limits all kinds of activity are prohibited, except for scientific investigations and nature conservation actions.

“Zakaznik” is a specially protected territory established with the goals of protection and study of the particular valuable natural complexes and objects, even the separate rare species of the plants and animals. The economic activity is allowed on the territory of zakaznik if this activity does not affect the protected complexes or objects. Depending on the type of protected object and protection goals, zakazniks can be landscape zakazniks, biological zakazniks, etc.

Natural landmarks are established with the goals to protect separate natural objects.

As of 1 January 2018, the system of the especially protected natural territories in the Republic of Belarus includes 1,285 objects (Fig. 1) including 1 natural reserve, 4 national parks, 99 zakazniks of the republican significance (35 landscape, 38 biological, 17 hydrological and 9 wetland zakazniks), 277 zakazniks of the local significance, 326

natural landmarks of republican significance and 578 natural landmarks of the local significance. The total area of the especially protected natural territories is 1,811.6 thousand hectares or 8.72 % of the territory of country (YURGENSON et al., 2012; \*\*\*, ESPECIALLY PROTECTED, 2019).

The system of the especially protected natural territories in Vietnam includes 164 territories (see Fig. 1). The basic structure of the protected territories in Vietnam is similar with Belarus. There are 32 National Parks, 90 Nature Reserves and 42 Cultural and Historical Sites. A few other categories of protected territories were established in Vietnam, such as Marine Protected Areas, Special Use Forests, Wetland Protected Areas etc. Species and habitat reserves were established for the protection of endemic or valuable flora and/or fauna. Scientific forests are specifically designated to protect sites used for scientific research. The total area of the especially protected natural territories in Vietnam is 2,499.4 thousand hectares or 7.58 % of the territory of the country (\*\*\*, UNEP-WCMC, 2019).

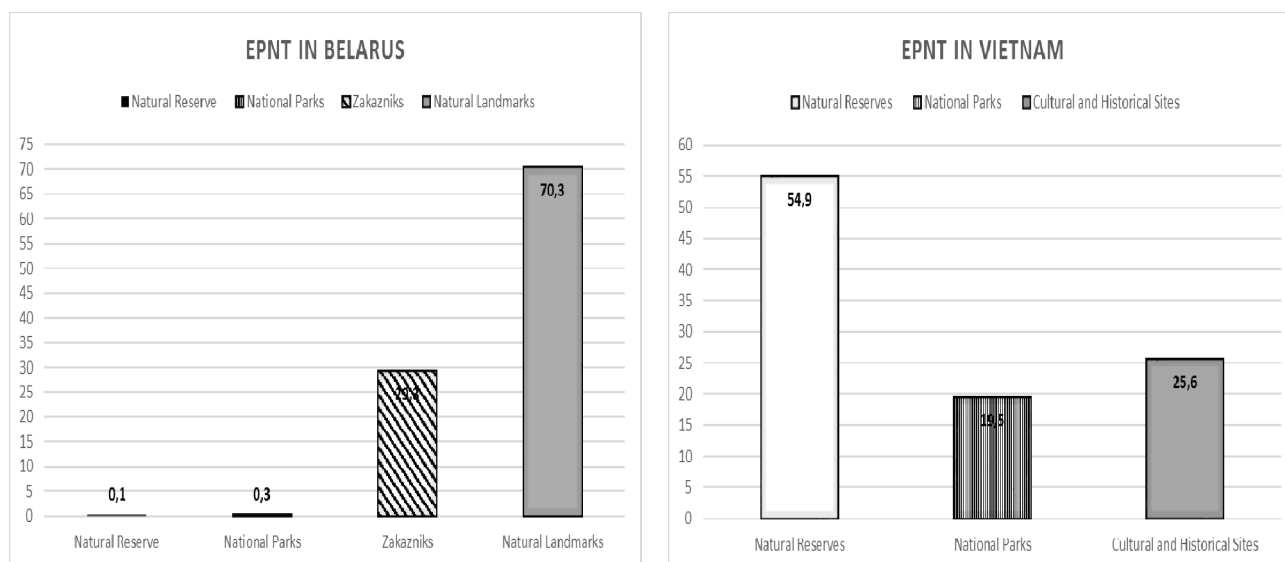


Figure 1. Structure of the especially protected natural territories (EPNT) in Belarus and Vietnam.

National parks in Vietnam were established for the protection of ecosystems containing high values for science, education, and tourism. Nature reserves were established to maintain ecological processes through the restoration of natural resources and biodiversity. Landscape protected areas or Cultural and Historical Sites protect natural and cultural sites with a high aesthetic value.

The system of the especially protected natural territories in both countries is similar but the proportion of the protected territories of different types is very different. The number of the natural reserves and national parks in Vietnam is much higher than in Belarus. Zakazniks play an important role in nature protection in Belarus. As of 1 January 2018 the total area of zakazniks was 13726 sq.km, or 6,6 % of the territory of Belarus. The percentage of the protected territories in both countries is similar, around 8 % of the total square of the country.

International and national criteria are used to establish the especially protected natural territory in Belarus. One of the important criteria is the presence and the number of the habitats of the plant and animal species from the Red Book of the Republic of Belarus. It is necessary that the certain number of the plant and animal species from the Red Book of the Republic of Belarus inhabited the potentially protected territory: at least 50 species for natural reserve, 30 species for national park, and 10 species for zakaznik.

A list of the threatened insect species of Belarus includes 87 species listed in Red Data Book and 133 species included in the annex to the Red Book as species requiring the special attention for additional study and preventive protection (\*\*\*, THE RED BOOK, 2015). There are 1 mayfly species (Ephemeroptera), 8 dragonfly species (Odonata), 3 orthopterous insect species (Orthoptera), one bug species (Hemiptera), 31 beetle species (Coleoptera) 34 butterfly species (Lepidoptera) and 9 hymenopteran species (Hymenoptera) in the main list of Red Book species. Table 1 shows that the Red Data insect species are well presented in the protected territories in Belarus. In the most important territories, the percentage of the Red Data species exceeds 20 % and even 50 % in a few territories. There is a weak trend of decrease in the number of rare species in the northern territories, although we suppose that the main reason of the low number of the Red Data species in some territories generally is the poor knowledge of the local insect fauna. It is important to emphasize that the overlapping of species lists does not extend in the different protected territories. It means that they are important for the protection of the local pool of rare and threatened species.

The most important territories for the Red Data insect species are the national parks and zakazniks of the large square with a diversity of the habitats. The undisturbed conditions of the ecosystems during a long time are very important for the survival of the rare species, too. Despite the relatively good knowledge of the Red Data species distribution in the Belarusian territory, the actual distribution in the protected territories needs a substantial clarification.

The number of Red Data species is underestimated in many protected territories, especially zakazniks (KULAK, 2015, KOZULKO et al., 2019).

The evidence of this problem is controversial in the data about the number and abundance of the Red Data insect species in the protected territories in Belarus from the different literature sources (YURGENSON et al., 2012; YURGENSON et al., 2017; \*\*\*. ESPECIALLY PROTECTED, 2019). More than 20 % of Red Data insect species are found only outside the limits of the especially protected territories. There remains the possibility that some of these species will be found in the protected territories in the future after their careful investigation. For example, 8 new habitats of critically endangered butterfly species *Zerynthia polyxena* (Denis & Schiffermüller) were found after the last issue of Red Book of the Republic of Belarus (SETRAKOVA & MAKOVETSKAIA, 2019). Although the new habitats are out of the protected territories, the climate changes and related changes of the vegetation may lead to a wider distribution of this species, also in the protected territories, or may activate the establishing of new protected areas.

Table 1. The number of Red Data insect species found in the most important especially protected natural territories (EPNT) in Belarus.

No.	EPNT	Number of Red Data insect species	Percentage of the Red Data insect species found in the EPNT, %
1	Berezinsky Biosphere reserve	37	42.5
2	“Belovezhskaya pushcha” National park	44	50.6
3	“Pripiatsky” National park	45	51.7
4	“Braslav Lakes” National park	12	13.8
5	“Narochansky” National park	10	11.5
6	“Zvanets” zakaznik	25	28.7
7	“Srednyaya Pripiat” zakaznik	37	42.5
8	“Sporovsky” zakaznik	18	20.7
9	“Naliboksky” zakaznik	15	17.2
10	“Olmanski bolota” zakaznik	23	26.

Most Red Data species are also known from the habitats outside the specially protected territories, but these populations are threatened. For example, the population of the species *Carabus clathratus* L., inhabiting wet fen habitats critically depends on conditions of the flood-plain ecosystems. The forest species *Carabus coriaceus* L. and *Carabus violaceus* L. are very sensitive to the disturbance of mature forest ecosystems. On another hand, some species are found only in the protected territories. For example, the species *Carabus intricatus* L. is known only from the National park “Belovezhskaya pushcha” in the south-west of Belarus.

A list of the threatened insect species of Vietnam includes 22 species listed in Red Data Book (\*\*\*. RED DATA BOOK OF VIETNAM, 2007) and 13 species proposed for inclusion (Table 2). Among 35 Red Data species only two butterfly species of the genus *Teinopalpus* are listed in IUCN Red List. All 35 species are found in the protected areas.

Table 2. List of the insect species included in Vietnamese Red Data Book.

No.	Taxon	Vietnam Red Data Book (2007)	Distribution
	<b>Phasmattodea: Phyllidae</b>		
1	<i>Phyllium siccifolium</i> (L.) (GB)*	VU	Tropical South-East Asia
	<b>Heteroptera: Belostomatidae</b>		
2	<i>Lethocerus indicus</i> (L. et S.)	VU	China, India, Indonesia, Malaysia, Myanmar, Japan, New Guinea, New Zealand, Sri Lanka, Vietnam
	<b>Coleoptera: Lucanidae</b>		
3	<i>Dorcus curvidens curvidens</i> (Hope)	CR	Bhutan, China, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Philippines, Taiwan, Thailand, Vietnam
4	<i>Dorcus antaneus</i> Hope	EN	India: Sikkim, Himachal Pradesh, Nepal, Bhutan, Myanmar, China: Yunnan, Xizang, Guangxi, Guizhou, Hainan, Thailand, Laos, Vietnam, Taiwan, Malaysia, Borneo, Sumatra, Java, Myanmar
5	<i>Dorcus titanus titanus</i> West.	EN	Japan, Indonesia, the Philippines, Malaysia, Thailand, Vietnam, Laos, Myanmar, India, China, Taiwan and Korea
6	<i>Odontolabis cuvera fallaciosa</i> Boil.	VU	China, Laos, Thailand, Vietnam
	<b>Coleoptera: Scarabaeidae</b>		
7	<i>Trypoxylus dichotomus politus</i> Prell. (GB)*	EN	China, Japan, Laos, Malaysia, South Korea, Taiwan, Thailand, Vietnam
8	<i>Chalcosoma atlas</i> L.	CR	Palaeartic (Nepal), Oriental (Vietnam, Cambodia, Myanmar, Perak, Sumatra, Nias, Java, Borneo, Philippines, Sulawesi, India: Mizoram)

9	<i>Cheirotonus battareli</i> (P.)	EN	Known only from the North Vietnam: Sa Pa (Lao Cai), Van Ban (Yen Bai), Tay Con Linh (Ha Giang), Mau Son (Lang Son), Pia Oac (Cao Bang), Tam Dao (Vinh Phuc), Pu Mat (Nghe An).
10	<i>Cheirotonus jansoni</i> (P.)	EN	Palearctic (China:Fujian, Guangdong, Guangxi, Jiangsu, Jiangxi, Sichuan, Zhejiang), Oriental (Vietnam, Myanmar, Laos)
11	<i>Eupatorus gracilicornis</i> (A.)	VU	China, India, Myanmar, Thailand, Laos and Vietnam
12	<i>Jumnos ruckeri tonkinensis</i> Nagal	CR	Malaysia, Thailand, Vietnam, India
	<b>Lepidoptera: Amathusidae</b>		
13	<i>Stichophthalma uemurai uemurai</i> Nish.	VU	Vietnam
14	<i>Zeuxidia mansonii</i> Moore	DD	Myanmar, Thailand, Vietnam
	<b>Lepidoptera: Nymphalidae</b>		
15	<i>Kallima albofasciata</i> Moore	DD	Andaman Islans, Vietnam (?)
	<b>Lepidoptera: Papilionidae</b>		
16	<i>Byasa crassipes</i> (Ober.)	DD	North east India (Manipur), Myanmar, Thailand, Laos, Vietnam, and possibly southern China.
17	<i>Papilio (Achillides) elephenor</i> Dub.	DD	India, Laos (?), Vietnam
18	<i>Papilio noblei noblei</i> Nic.	VU	Myanmar, Thailand, Laos and Vietnam
19	<i>Teinopalpus aureus aureus</i> Mell. (GB)*	VU	China, Laos, Vietnam
20	<i>Teinopalpus imperialis imperialis</i> Hope (GB)*	VU	Nepal, India, Vietnam
21	<i>Troides helena cerberus</i> Felder (GB)*	VU	Nepal, India, Bangladesh, Myanmar, Malaysia, Singapore, Indonesia, Laos, Cambodia, Thailand, Vietnam, southern China. Indonesian archipelago, Sumatra
22	<i>Troides aeacus aeacus</i> Felder (GB)*	VU	From Nepal until Taiwan and Indonesia

**Legend:** Remark: VU (Vulnerable), EN (Endangered), CR (Critical Endangered), DD (Data Deficient), (GB)\* Records in the GenBank.

It is possible to see that the geographic ranges of the Red Book species embrace not only the Vietnamese territory but also the territories of a few other countries. The level of protection is different in those countries. The distribution of the species as well as their threatened status needs clarification because of the deficiency of data.

Obviously, the list of threatened species is very incomplete. The Vietnamese insect fauna is very poorly studied. More than 100 new species are described every year. At the same time the number of endemic insect species and even genera increases. The most studied order of insects is the Order of butterflies. Over 1,100 butterfly species are known from Vietnam, about 7 % of them are considered endemic in Indo-China (Vietnam, Laos, Cambodia and east Thailand) (MONASTYRSKII, 2010).

In Vietnam, 177 tiger beetle species were found, 59 (33.3%) of which are endemic. The highest percentage of the endemics is in the genera *Neocollyris* and *Therates* – 28 species (15.8%) and 16 species (9.0%) respectively. In the genus *Neocollyris*, three subgenera are the most rich in endemics. There are 8 endemic species (4.5%) in the *Isocollyris* subgenus, 7 (4.0%) – in *Pachycollyris* and 5 (2.8%) – in *Leptocollyris* (WIESNER et al., 2017).

Many endemic species in Vietnam are local species (especially in the mountains). Therefore, it is impossible to conserve them properly by establishing a bundle of protected areas because of divergent economic interests, interests of local communes and nature protection.

The generally poor studied Vietnamese insect fauna is a problem for including separate species in the Red Book and for the use of species for assessment of the effectiveness of the protected areas. Many insect species are known in a single specimen in Vietnamese territory, therefore, it is very difficult to understand the degree of rarity and threat to these species in the natural ecosystems.

The insect fauna has been studied much better in Belarus than in Vietnam. Nevertheless, the same problem of poor knowledge of the local faunas exists in the protected territories in Belarus. Generally, it is possible to state that the existing system of especially protected natural territories is quite effective for protection of the Red Data insect species. The diversity of the Red Data species with the different ecological requirements in the protected territories shows that a selection of these territories was properly accomplished. The network of specially protected natural territories in Belarus improves and modifies every year. In 2014, the Belarusian Government adopted The National strategy for development of the system of specially protected natural areas until January 1, 2030, that must ensure the conservation of the natural ecosystems, biological and landscape diversity. Similar work is performed in Vietnam. According to the approved national planning system of Special Use Forests up to 2020, Vietnam will have 34 national parks (AN et al., 2018). The increasing number of national parks may improve the conservation and sustainable development of significant natural ecosystems and endangered and rare species in Special Use Forests (\*\*\*. GOVERNMENT OF VIETNAM, 2014).

The problem of the effectiveness of the protected area network for biodiversity conservation repeatedly arose in the countries adjacent to Belarus. In Russia, the representativeness of vertebrate animals in the protected territories is about 90 %, while for mammals it is close to 100 % (KREVER et al., 2009). At the same time, it is impossible to do a

similar assessment for insects. The representativeness of the insect species included in the Russian Red Book exceeds 70 % in the protected territories. The expansion of the existing protected area network is proposed as the main approach to enhance the effectiveness of the protected areas in biodiversity conservation in Russia.

A number of scientists long ago explored the problem of the “matrix” or a forest landscape not included in the protected areas, but important for the protection of the local diversity (LINDENMAYER & FRANKLIN, 2002). The problem is that nature reserves are considered as “habitats” and the other forests as “non-habitats”. Most forests in the temperate zone are managed or will be managed. The problem of the increased use of tropical forests by human society may lead to similar situations. Nature reserves cannot perform the functions of biodiversity conservation adequately without additional measures for its protection in the remaining territory, first of all providing for proper forest management.

Many threats to biodiversity in the Asia and Pacific regions require new policy and approaches to biodiversity protection (SQUIRES, 2013). The conservation of native habitats remains a priority. At the same time, a reasonable compromise must be sought between the needs of local communities in the production of organic products and hard restrictive measures for the use of nature ecosystems and local biodiversity.

It was indicated that Vietnam’s protected areas are inadequately managed (\*\*\*. VIETNAM TROPICAL FORESTS, 2013). They point out that the challenges to effective protected area management in Vietnam include: 1). Inadequate financing; 2). Lack of enforcement authority by protected areas management boards; 3). Overlapping institutional mandates; 4). Lack of protected area management know-how, particularly in the case of Provincial People’s Committees; 5). Inadequate human resources; 6). Human pressure in the absence of enforcement capacity or effective community participation; 7). Fragmentation and the construction of large infrastructure within protected areas; and 8). Land grabbing. These problems lead to the loss of local and regional biodiversity.

There is a dangerous trend of unprecedented extinction of species in Vietnam in the first decades of the 21<sup>st</sup> century (\*\*\*. WORLD BANK, 2005). In the 2000s the Vietnamese government has developed collaborative or “co”-management approaches in Special Use Forests (most of them are specially protected forests) under the guidance of the Convention on the Biodiversity Programme of Work on Protected Areas with funding from the Global Environment Fund and the European Union (KIM DUNG et al., 2017).

However, the modern development of the way to which Vietnamese laws and policies support co-management remains unclear. One of the important mechanisms to improve the situation is using “co-management” to provide the integration of nature conservation and sustainable development. There are the successful examples of harmonizing conflict between the assurance of local livelihoods, market demands and nature conservation in the Xuan Thuy national park (KIM DUNG, 2019).

In this case the local people became resource users and responsible for the sustainable use of the resources. At the same time, they became stakeholders in the protection of all components in the protected territory including environment and habitats for Red Data species.

## CONCLUSIONS

The system of specially protected natural territories in both countries is similar, as is the percentage of the protected territories, and it amounts to around 8 % of the total square of each country. In Belarus, the effectiveness of the protected areas according to the criterion of presence of Red Data species in the protected areas is very high because 1). More than 80 % of the Red Data species are present in the protected areas, 2). There are at least three Red Data species in every territory and 3). Some species are present almost exclusively in the protected territories. There is a problem in using this criterion in Vietnam because of the poor knowledge of the regional biodiversity and the local faunas, the existence of a large number of the endemics and undescribed species, as well as the rarity of many species.

Both countries make efforts to improve the national system of specially protected natural territories. In order to improve the effectiveness of the conservation of Red Data insect species in the protected territories in Belarus it is very important to find new habitats of rare species, to understand their regional ecological requirements and biological features. In Vietnam, the main problem in the protection of the rare species is a conflict of interests of the local communities and conservationists.

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