

Nature Protection in Armenia and Slovakia

Abstract

Protected areas are clearly defined geographical spaces which are created to achieve long-term conservation of nature and surrounding areas, including cultural heritages, flora, fauna, etc. Nature conservation is one of the basic responsibilities of the state, society and every person. The main objective of this contribution is to present current state and structure of nature protection of protected areas in Armenia and Slovakia. Legal regulation In Armenia is based on the Law of the Republic of Armenia on Specially Protected Nature Areas (ՀՕ-211-Ն) (November, 2006). At present the system of Specially Protected Nature Areas in Armenia includes 4 categories of protected areas: state reserves/strict nature reserves, national parks, sanctuaries/ state reservations, nature monuments. Legislative basis for nature protection in Slovakia is the Act No. 543/2002 Coll. on Nature and Landscape Protection. From the point of view territorial protection, protected areas in Slovak Republic are classified into 8 categories: national parks, protected landscape areas, protected site, nature reserve, nature monument, protected landscape fragment, protected bird area, protected area established by municipality. We present two significant protected areas from both countries to emphasize their importance in the structure of nature protection, their law regulation and uniqueness from the point of view flora, fauna, climate and location.

Key words: nature and landscape protection, territorial protection, protected areas, management

The history of nature conservation goes far in the past. The idea of modern protected areas dates back to 1872, when the Yellowstone National Park was established. It encouraged the development of nature conservation in the world (Lu et al., 2005). One of the main challenges of nature conservation around the world is to help preserve the diversity of conditions and forms of life. Nature conservation is one of the basic responsibilities of the state, society and every person.

The most effective and most comprehensive form of nature conservation is territorial protection, which protects not only individual species or groups but also their habitats. A common vision of nature conservation around the world should be the intensive promotion of politic cooperation towards ensuring the nature conservation and sustainable development. Stopping or slowing down the ongoing process of species extinction and reducing biodiversity around the world should be the main objective of international cooperation on environment and nature conservation.

Nature protection in Armenia

The Republic of Armenia is located in the north-eastern part of the Armenian Plateau and occupies 29,740 km² at altitudes ranging from 375 to 4095 meters above sea level. Armenia is a mountainous country with a characteristic ragged relief and a wide variety of climatic conditions and soils. In addition, Armenia is located on the intersection of two

different physical-geographic areas, particularly, various botanical-geographic regions, such as the Caucasian mesophilous and Armenian-Iranian xerophilous ones, where natural speciation is active (Khanjyan, 2004). On the small territory of Armenia, there are more than 3500 species of high vascular plants and more than 17500 species of animals including 536 species of vertebrates. In the Red Book of Armenia there are 452 species of higher plants, 40 species of fungi, 153 species of vertebrates and 155 species of invertebrates; a number of species are registered in the IUCN List (Table 1.) (WWF Armenia, 2012).

Table 1. Estimated found of species found in Armenia

Category	Total	Endemics	Percentage
Plants	3,555	106	3%
Invertebrates	17,500	316	1.8%
Fish	30	9	30%
Reptiles	8	1	12%
Birds	356	0	0%
Mammals	83	0	0%

In Armenia, the conservation and preservation of natural heritage is safeguarded by the Ministry of Nature Protection (MNP).

Foundations for Legislation on Nature Protection of the Republic of Armenia determine the nature protection policy of the Republic of Armenia. They aim to provide the protection of nature environment and the regulation of use thereof, on the Armenian territory.

Armenia has established and continues to create “traditional” protected areas. These tend to be relatively small, stridently conserved landscapes such as State Reserves and National Parks. Although very important, these areas are ecologically isolated and fail to incorporate a wide variety of habitats (UNDP, 2014).

These Foundations also seek to create a necessary legal basis for the development of the legislation on nature protection, with the intention to regulate the protection and to use relationships of entrails, forests and waters, flora and fauna, and of atmospheric air.

According to the Law of the Republic of Armenia on Specially Protected Nature Areas (SPNA) (December 17, 1991) “Specially protected areas are those territories of surface and ground waters, underground resources, flora and fauna, which are designated by the order determined by law and have special ecological, scientific, medicinal, cultural, esthetic value and entirely or partially, temporarily or permanently are not subject to commercial exploitation” (Khanjyan, 2004).

In 2006, adopted the Law of the Republic of Armenia on SPNA and in order to ensure the enforcement of the Law the Government of the Republic of Armenia approved a number of regulations, including the “The procedure for organization and implementation of the monitoring of SPNAs (30.08.2007. № 1044-N act), “The procedure of State Cadastre of Protected Areas ” (20.03.2008 No. 259-N act), “The procedure for the creation of protected areas ” (22.01.2009 № 72-N act).

NSPAs are mainly managed by the MNP, but several sanctuaries belong to the Ministry of Agriculture and Ministry of Economy. NSPAs have their own management

bodies. They have a status of State Non-Commercial Organizations (SNCO) and are regulated by the law on “Specially Protected Areas” (Gasparyan, 2014).

The strategic goal of SPNAs development in Armenia is the protection of natural complexes, landscape and biological diversity, unique and typical natural complexes, objectives and their genetic fund (Ghalachyan, 2008).

The establishment of a system of SPNAs in Armenia started in 1958, when the first protected areas (3 reserves and 6 sanctuaries) were established. The Law on Specially Protected Natural Areas (2006) creates four broad categories of protected areas: State Reserves, National Parks, Sanctuaries, and Natural Monuments. System of current protected areas is presented in Table 2.

- State Reserves/Strict Nature Reserves-3 (Khosrov, Shikahogh and Erebuni), which cover the territory of 35,439.6 ha making 1.19 % of the total territory of Armenia.
- National parks- 4 (Sevan, Dilijan, Arpi Lake and Arevik), which cover the territory of 236,802.1 ha making 7.96 % of the total territory of Armenia.
- Sanctuaries/ State Reservations -27 which cover the territory of 114,812.7 ha making 3.95 % of the total territory of Armenia.
- Nature monuments-230.

Table 2: Current Protected Ares System in Armenia

Area type	Number	Total Area (ha)	Percent of Territory Represented
State Reserves/Strict Nature Reserves	3	35.439.6	1.19 %
National parks	4	236.802.1	7.96 %
Sanctuaries/ State Reservations	27	114.812.7	3.95 %
Nature monuments	230	N/A	-

Source: WWF Armenia

At present the SPNAs of Armenia occupy about 380 thousand ha making about 12,5 % (including Sevan Lake) of the territory of Armenia (WWF Armenia 2012, National report of RA to the Convention on Biological Diversity, 2014).

State reserves are established in allocated areas to protect the natural course of dynamic processes and rare species of flora and fauna. These are scientific research entities where human activity is restricted. Here a strict protection regime is applied, human intervention is entirely prohibited (logging of trees, hay-making, hunting and introduction of animals, plant gathering etc.) in favor of natural development. By the IUCN international classification (1994) state reserves are protected areas of Ia category.

National parks are areas of ecological, historical-cultural, aesthetic significance and in contrast with state reserves they have protection regimes determined by functional zoning. Usually special zones are designated in national parks: protection zone with strict regime of protection, as well as recreational and economic zones. By the IUCN classification national parks of Armenia are category II protected areas. International experience with national parks proves that protected areas of this status are highly viable.

Nature monuments are exceptional natural objects having special scientific or historical-cultural significance; they correspond to category III of the IUCN classification.

Reservations can be protected areas of national or local significance with protection regime established in accordance with their purpose. By the IUCN classification reservations of Armenia are close to category IV protected areas (Khanjyan, 2004).

First specially protected nature areas of Armenia - Dilijan, Khosrov Forest and Shikahogh Reserves were established almost at the same time in 1958. The same year 6 reservations were established. All of them are of forest protection significance (Khanjyan, 2004).

As a case we have chosen Khosrov Forest State Reserve. Khosrov Forest State Reserve is the oldest protected area in Armenia (Fig. 1). It was founded in 334-338 as a hunting ground by the order of the Armenian King Khosrov Kotak (Khanjyan, 2004).

In the era of the Soviet Union the Khosrov Forest was set aside as forestry and on 13 September 1958 the Garni Forestry was granted a status of Khosrov (then Garni) Reserve. The size of the reserve then was 148.61km². The reserve became a protected area because the high-quality freshwater supplies the Azat River which flows down to Yerevan and the surrendering forests. In 1990 the reserve became 291.96km² which some adjacent lands were incorporated in it and in 2006–2007, the reserve was reduced to 238.78km².

The reserve has been official status to the IUCN Ia category. Since 1995, the reserve has been subordinated to the Ministry of Nature of Protection of the Republic of Armenia, managed through its Agency for Biological Resources Management and operating as the Khosrov Reserve non-profit organisation. Between 2006 and 2007, a process was underway to develop and approve a management plan for the reserve which aims to improve the reserve's environmental and socio-economic status which came from a 1993 compliance from the Convention on Biological Diversity (econews.am).

In 2002, the government of Republic of Armenia approved a number of acts, including the act N 925-Ն, in order to confirm the statute of “Khosrov” state reserve and “Khosrov State Reserve” State Non-Commercial Organization (SNCO) and to reorganize the institution “Khosrov State Reserve”.

The management plan of Khosrov State Reserve was adopted in 2009. SPNAs management plans have been developed to ensure the efficiency and development of protection and management of SPNAs.

Khosrov Forest State Reserve was awarded by the Council of Europe with the European Diploma on Protected Areas (CM/ResDip (2013) 2 special resolution of the European Committee of Ministers dated 10 July 2013) (National Report of RA to the Convention on Biological Diversity, 2014).

The reserve is located on the scenic slopes of Mounts Yeranos, Dahnak, Irits and Khosrovasar, as well as the Yerakh and Urts mountain ranges, at the altitude of 900-2400 m above sea level spreading from semi-deserts to the upper limit of forest zone (Khanjyan, 2004).

The landscape diversity of the reserve is high, it is one of the richest with biodiversity nature reserves' in the temperate zone of the Earth. The diversity is due to the difficult mountainous relief, steep zoning and peculiarities of soil-climate conditions. Covering only about 23.5 thousand ha, Khosrov Forest is a home for more than the half of the flora of Armenia (more than 3500 species) and about 1/3 of the wealth of the Caucasus flora (about 6000 species). The big range of mountainous ecosystems are habitats of 283 species of

vertebrates, including highly endangered Caucasian leopard, Bezoar goat, Black vulture, Caspian snowcock, Armenian viper etc. (khosrovereserve.am).

Khosrov Forest reserve with its flora diversity attracted many researchers. Among them it is specifically worthwhile to mention the world-known scientist academician A.Takhtajan along with his colleagues (An.Fyodorov, A.Araratyan and others), representatives of the Armenian botanical school (under Takhtajan's leadership), and especially professor E.Gabrielyan. A.Takhtajan initiated the publication and edited 11 volumes of the work "Flora of Armenia", which summarizes all flora species of Armenia including the ones of Khosrov Forest reserve (Khanjyan, 2009).

High diversity is typical for the reserve flora. The gems of the reserve are the sparse forests of tertiary relict juniper (*Juniperus L.*) and oak (*Quercus L.*). Juniper (*Juniperus polycarpus C.Koch*) is common on dry and steep southern slopes and form sparse juniper forests with characteristic grass cover. The oak forests consist of *Q. macranthera Fisch. et C.A.Mey. ex Hohen.* occurring in sparse or sometimes large dense homogenous oak forests. Khosrov Forest Reserve with such a rich diversity of semi-desert, forest, xerophilous and especially Mediterranean types of vegetation such as frigana, tomillares, tragacanth and others is the only one both in Armenia and in the whole Caucasus region.

The reserve is well known for the rich diversity of fauna. According to the management plan (2009) of the reserve there are 283 species of vertebrate animals (Khanjyan, 2009). Numerous species of mollusks and fish (trout - *Salmo fario*, roach - *Rutilus rutilus*) have been registered in the water basins. Reptiles are represented by about 30 species (*Pseudopodus apodus*, *Erix jauculus* etc.). There are about 130 species of birds (European short-toed eagle - *Circaetus gallicus*, partridge - *Alectoris chukar* ect.). Mammals are represented by approximately 50 species (weasel - *Mustela nivalis*, marten - *Martes foina*, wild cat - *Felis silvestris*, wild boar - *Sus scrofa* etc.) (Khanjyan, 2004).



Fig. 1: Khosrov Forest State Reserve

Recently, in summer 2017, a fire that burst out in Khosrov State Reserve covered substantial part of the state reserve, which has affected the local ecosystem and it caused extremely great damage to flora and fauna. It will take long time to recover from the damage as huge amount of forest is destroyed.

Nature protection in Slovakia

The Slovak Republic is located in Central Europe and has an area of 49 036 km². The surface of Slovakia is characterized by a wide diversity and several geographical types are represented. From the lowlands in the south, the landscape passes through the highlands to the high mountains, in the north. However, most of the landscape is slightly wavy, so the average altitude is 392 m (Atlas of the Slovak Republic, 2002).

The territory of Slovakia provides a varied mosaic of natural beauties that deserve protection. Present protection of nature seeks to ensure and preserve the diversity of the conditions and forms of life on Earth, by creating conditions for the sustainable maintenance, restoration and rational use of natural resources, protecting natural heritage, landscape, biodiversity and preserving its ecological stability. Legislative basis for nature protection is the Act No. 543/2002 Coll. on Nature and Landscape Protection. According to Section 2 of this Act, the term "nature and landscape conservation" means the care of the state, legal entities and individuals of plants, animals, their populations, natural habitats, ecosystems, minerals, fossils, geological and geomorphological formations, also care for the appearance and use of the landscape".

Territorial protection, implemented by means of specially protected areas, is one of the most important instruments in nature and landscape protection. Protected areas of Slovakia are areas that need protection because of their environmental, cultural or historical value to the nation. It is strictly prohibited to destroy the environment of protected areas by polluting it with garbage, unnecessary noise, to damage, destroy or pick protected plants, hunt or disturb protected animals. There are tourist pathways you can use for hiking or walks. Educational paths are surrounded by tourist signs with various information about nature.

Protected areas relies the implementation of such objectives:

- conservation of valuable natural and cultural-historical complexes and objects;
- creating conditions for recreation, effective tourism, and other types of outdoor activities in natural conditions in compliance with the regime of protection of preserved natural complexes and objects;
- promoting environmental education work.

The principle of the existence of protected areas is based on the fact that the valuable ecosystems, or landscape character, are preserved and the negative impacts of man in them are limited or minimized. This objective can be achieved through a special regime, other than in areas, where from the point of view of nature conservation, is nothing to protect (Antoška, 2015).

Protected areas in Slovak republic are classified into following categories (Act No. 543/2002 Coll):

- National parks (NP)
- Protected landscape areas (PLA)
- Protected site (PS)
- Nature reserve (NR), National nature reserve (NNR)
- Nature monument, National nature monument,
- Protected landscape fragment (PLF)
- Protected bird area

- Protected area established by municipality

The area can be declared as protected also by municipality in case if there is exceptional cultural, scientific, ecological, aesthetic or landscaping meaning.

Pursuant to the Act No. 543/2002 Coll. on nature and landscape protection, the system of complex nature and landscape protection is carried out under 5 protection levels. The lowest protection level is 1st and highest 5th. The range of limits for activities increases with the increasing degree of protection. The first level of protection applies generally throughout Slovakia. If protected area requires wider protection, it is possible to declare its protection zone, where protection is one degree lower.

Protected areas from 2nd – to 5th protection degree cover 23,39 % (1 147 059 ha) of Slovakia. The area of 9 National parks and 14 Protected landscape areas and their protection zones is 22.49 % (Table 3).

Table 3: Protected Ares in Slovakia (31. 12. 2016)

Area type	Number	Protected areas (ha)	Protection zones (PZ) (ha)	Percent of territory Represented of Slovakia (+PZ)
Protected landscape areas (PLA)	14	522 582	-	10,66
National parks (NP)	9	317 541	262 591	11,83
PLA + NP (number)	23	-	-	-
PLA + NP – expanse (ha)	1 102 713 ha	840 122	262 591	22,49

(www.sopsr.sk, 2016)

The area of other protected areas covers 2.37 % of the territory of the state. In Slovakia there are protected areas without defined levels of protection. There are 41 declared protected bird areas with a total area of 1 284 806 ha and 20 caves with a protection zone with a total area of 3 347 ha. Protected areas with higher, fourth and fifth degrees of protection are the most preserved and most valuable parts of the country. Therefore, the most stringent protection regime applies to these locations. They are preserved mainly in inaccessible places, in areas unsuitable for management, or only on land of private owners. Fifth, the highest level of protection applies only to 1.75 % of Slovakia's territory (www.sopsr.sk, 2016).

Protected areas can also be divided into zones if the character of nature values requires it. The zones shall be defined as integral parts of the protected area according to the character of the natural values, the originality of the ecosystems, the extent of human intervention and the use of the territory by man. The fifth level of protection is determined in zone A, fourth degree of protection in zone B, third in C zone and the first or second degree of protection in zone D.

Overview of protection levels and zones (Ministry of Environment of Slovak Republic, State of the Environment Report of Slovak Republic, 2008):

- 1st level of protection - territory of the SR not included in any of the higher levels of protection
- 2nd level of protection - protected landscape area (PLA),
 - protected landscape fragment (PLF),
 - zone D of protected area
 - protective zone of the PA with 3rd level of protection.
- 3rd level of protection - national park (NP)
 - protected site (PS),
 - protected landscape fragment,
 - zone C of the protected area,
 - protective zone of the PA with 4th level of protection.
- 4th level of protection - protected site,
 - nature reserve (NR), national nature reserve (NNR)
 - nature monument (NM), national nature monument (NNM),
 - protected landscape fragment,
 - zone B of the protected area,
 - protective zone of the PA with 5th level of protection.
- 5th level of protection - protected site,
 - nature reserve, national nature reserve,
 - nature monument, national nature monument,
 - protected landscape fragment,
 - zone A of the protected area,
- cave and cave protective zone,
- natural water fall and protective zone of the natural waterfall,
- special protection area (SPA).

By joining the European Union, Slovakia has also adopted the European Nature Conservation System through the establishment of a set of protected areas called NATURA 2000. Its main objective is the preservation of the natural heritage. It provides protection for the rarest and most endangered species of wild plants, wildlife and natural habitats occurring in the territory of the EU. The Natura 2000 system consists of two types of territory:

1. Protected bird areas – are declared under the Birds Directive to ensure bird protection

2. Areas of European Importance - are declared under the Habitats Directive to ensure the protection of other rare and endangered plant and animal species and their habitats. The Slovak Republic has contributed to Natura 2000 41 protected bird areas and 473 sites of European significance (MŽP, 2016).

As a case study of nature protection, the Protected Landscape Area Horná Orava was chosen.

PLA Horná Orava is situated in northwestern part of Slovakia. West, north and east border of area is copying the slovak – Polish borderline. South and southeast border are rivers Biela Orava, Oravica and Jelešná (Atlas krajiny SR, 2002). Horná Orava is in adjacent to Babiogórsky Park Narodowy a Żywiecky Park Krajobrazowy in Poland.

For the first time, the legal protection to this territory was given in 1978 by the decree of the Ministry of Culture (MC) of the SSR no. 14/1979 Coll. This decree was canceled and amended in the following year, because it did not include the comprehensive definition of the protected area and other prescriptive requirements (Trnka, 1999). Thus, the Protected Landscape Area of Horná Orava (70 332 ha) was officially declared by Decree of MC SSR no. 110/1979 Coll. and amended by Decree of the Ministry of the Environment no. 420/2003 Coll., where Horná Orava Protected Landscape Area and its zones were defined.

PLA Horná Orava occupies an area of 58 737,83 ha. Due to character of natural values the area is segmented into zones A, B, C, D. In order to preserve habitats of bird species of European importance and habitats of migratory species of birds, the Ministry of the Environment of the Slovak Republic by Decree 173/2005 Coll. declared the PLA Horná Orava also as Protected bird area Horná Orava.

Protected Landscape Area Horná Orava is the first protected area in Slovakia with zonation. The aim of zonation is based on definition of different protection requirement for habitats, due to their natural values, current status, economic and cultural use, as well as on the proposal for the definition of territories of European significance of the NATURA 2000 system.

Another objective was to reduce the areas with the 5th degree of protection in order to provide more effective management in these areas and to reduce the claims of the owners for the compensation of the harm. Zoning also ensures the continuity of the differentiated protection of the PLA (Trnka, 2004).

The eastern part of the territory was registered in the List of Wetlands of International Importance in the sense of the Wetland Convention (Ramsar Convention) in 1998 as "Ramsar locality – Orava basin Wetlands" (Mokrade Oravsklej kotliny). The territory is 9 287 hectares and the reason for its listing was the occurrence of rare types of wetlands, especially forest and non-forest peatlands and bogs (Sosnina, Rudné, Surdíky, Klinské rašelinisko). From other types of wetlands there are preserved sub-mountain water streams, marshes with shrubs, moors and artificially created lake Orava dam (Oravská priehrada) (Trnka, Kopilec, 2007). An exceptional phenomenon in the vegetation of Horna Orava is the presence of a considerable variety of peat phytocoenoses with the occurrence of characteristic rare and endangered plant species, such as *Andromeda polifolia*, *Ledum palustre*, *Rhynchospora alba*, *Drosera rotundifolia*, *Viola palustris*, *Oxycoccus palustris*, *Empetrum nigrum*, *Calla palustris*.

For the protection of habitats of animals and plants that are rare or threatened within the European Union, since 2004, 10 territories of European significance have been approved in the Horná Orava PLA. These territories of European importance (Pilsko, Babia hora, Peatlands of Oravské Beskydy, Peatlands of Biela Orava, Springs of Hruštinka, Slaná voda, Orava water reservoir, Jelešňa, Peatlands of Oravská kotlina, Zimníky) together occupy 3,026 ha, which represents 5.2 % of the area of PLA. In territories of European significance 20 Habitats of European significance are represented, of which 5 are priority habitats. The most represented habitats are mountain spruce forests of Babia Hora, Pilsko and Minčol. Bog woodlands also cover large areas. The most precious habitats of Slovakia and Europe include non-woody peatlands and bogs in the Klinsko and Mútňany and in the Suchá Hora.

The proposed territory of European significance - Orava Water Reservoir (Fig. 2), is different from the other territories because it does not focus on the protection of the original habitats but on the protection of habitats created by the artificial intervention of man - the launching of Oravská priehrada dam (Trnka, Kopilec, 2007). The water reservoir Orava,

providing suitable conditions not only for ichthyofauna (*Cyprinus carpio*, *Alburnus alburnus*, *Rutilus rutilus*, *Leuciscus leuciscus*, *Esox lucius*, *Perca fluviatilis*), Amphibians (*Rana lessonae*, *Rana temporaria*, *Bufa bufo*, *Bombina variegata*, *Triturus alpestris*, *Salamandra salamandra*), but especially for birds (*Haliaeetus albicilla*, *Grus grus*, *Gavia spp.*, *Pandion haliaetus*, *Alcedo atthis*, *Ciconia nigra*, *Charadrius dubius*, *Actitis hypoleucos*, *Cinclus cinclus*).

Protected Landscape is used to fulfil its primary mission, which is the conservation of exceptional natural treasures, and for recreation, sports, education, therapy and hiking usages.



Fig. 2: Orava Water Reservoir (Novanska, 2008)

The most serious problems currently facing the PLA Horná Orava are wind and bark beetle catastrophes in spruce forests, relatively high anthropic (human) pressure on the PLA land and indirect anthropogenic influences.

Conclusion

The protection of biodiversity and its sustainable use is an important topic throughout the world. The concept of biological diversity includes the diversity of living creatures at all levels, from genetic diversity within a species, through species diversity of all plants, animals and micro-organisms to the diversity of organisms in ecosystems.

Recognizing the dependence of human civilization on the living environment and the threat of unreasonable exploitation of living nature may pose, it is essential to pay increased attention to ecosystem management. The option of moving towards sustainability requires rapid and correct decisions on global challenges such as species loss, ecosystem quality degradation and climate change. In order to mitigate the adverse effects of human activities on nature and landscape, particularly in relation to species and habitats of national and European conservation interest in the protected areas concerned, corrective measures must be adequately incorporated into the management plans of each protected area.

Protected areas are essential for biodiversity conservation, often providing habitat and protection from hunting for threatened and endangered species. Protection helps maintain ecological processes that cannot survive in most intensely managed landscapes.

The main factor influencing the further direction of nature conservation in Armenia and Slovakia is the implementation of nature conservation principles in the country's nature conservation system.

In particular, the interest of state nature conservation must be to ensure the protection of representative areas which are a prerequisite for preserving biodiversity and to preserve and create conditions for the conservation of natural populations in their natural habitat. In the localities belonging to the system of protected areas, it is necessary to achieve a favourable status of species and habitats and to preserve their ecological character in cooperation with owners, administrators and land tenants in protected areas through care programs and raising the awareness of the population.

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