MINISTRY OF ENVIRONMENT AND SPATIAL PLANNING
REPUBLIC OF SERBIA

NATIONAL REPORT ON THE IMPLEMENTATION OF THE AGREEMENT ON THE CONSERVATION OF BATS IN EUROPE

2009

SERBIA

An Update

Belgrade, April 2010

NATIONAL REPORT ON THE IMPLEMENTATION OF THE AGREEMENT ON THE CONSERVATION OF BATS IN EUROPE

SERBIA

Contents:

A. General Information

Name of the non-party range State: Republic of Serbia

Date of Report: April 21, 2010

Period Covered: March 31, 2009 – March 31, 2010

Competent Authorities: Ministry of Environment and Spatial Planning (MESP)

Organizations providing support and expertise:

Natural History Museum – Belgrade (NHMB)

NGO Wildlife Conservation Society MUSTELA (WCS MUSTELA)

Appointed members of the Advisory Committee:

Ms Jelena Dučić , (MESP)

Mr. Milan Paunović, (NHMB, WCS MUSTELA)

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B. Status of Bats within the Territory of Serbia

1. Summary Data on Resident Species

Introduction

Up to now, on the territory of Serbia 29 bat species from two families (Rhinolophidae and Vespertilionidae) have been recorded. Data on bats are richest for regions of Eastern and Western Serbia (because of the presence of large limestone areas and suitable underground roost sites, as well as because of being most studied) and for the city of Belgrade and its surrounding. Presence of all of the species is documented with voucher specimens that are now kept in collections of Natural History Museum in Belgrade, Museum Department of the Institute for Protection of Nature in Novi Sad and Zoological Institute in Saint Petersburg, Russia.

First data concerning bats in Serbia originated from second half of 19th Century. Researches were sporadic until 1954, when late Dr. Đorđe Mirić became a curator of Mammal collection of Natural History Museum in Belgrade. Dr. Mirić has founded bat ringing and bat taxonomy and distribution studies of in Serbia (Mirić *et* Paunović 1994; Savić *et al*. 1995), surveying hundreds of roost-sites, collecting thousands of specimens for Museum collection and recording a number of species for the first time in Serbia. Although previous generations have laid a solid foundation, collecting multitude of data, until recently most of that data have remained fragmentary, scattered or even unpublished (Mirić *et* Paunović 1994), some out-of-date.

Since the last decade of 20th century, as current generation of bat workers step forward, researches have become more intensive, systematic and targeted, but also intensive processing, analyses and syntheses, of previous and recent data have started (Savić *et al.* 1995). Those recent bat-workers' efforts, together with awareness aroused in responsible authorities, have led to development of national action plan for conservation of bats (Paunović *et al*. 2004). Action plan is a cornerstone for the book on diversity of bats in Serbia, a capital project preoccupying bat community in Serbia for the last four years, but postponed for a short time, pending results of recent taxonomic and genetics studies.

For the last few years museum specimens, as well as data and samples provided by targeted field research, have been systematically investigated by means of both classic taxonomic analyses and genetics analyses. Intensive genetics analyses have started in 2008 as en excellent co-operation with Dr. Javier Juste from the Department of Evolutionary Biology of Estacion Biologica Donana (CSIC), Seville, Spain, have been established.

Check list of the species with comments on its distribution, status and bionomy
(Paunović *et al.* 2004, modified according to more recent unpublished data)

Rhinolophus blasii Peters, 1866

It is found exclusively in caves of hilly limestone areas of the country throughout the year. 14 sites are known, and all of them are mixed colonies with *Rhinolophus euryale* and occasionally other species. Short-distance seasonal migrations between the winter and summer roosts were registered.

Rhinolophus euryale Blasius, 1853

It is a common cave dweller of hilly-mountainous limestone areas. It is the most common and most abundant among the three "medium size" species of horseshoe bats, known at 60 sites. It constitutes mixed summer and nursery colonies of 100-400 individuals with other cave-dwelling species. It hibernates in caves. The largest known colonies consist of about 1.000-2.000 individuals, together with *Rh. blasii* and *Rh. mehelyi*, or with *M. emarginatus* at lower altitudes. Short-distance seasonal migrations between the winter and summer roosts were registered.

Rhinolophus ferrumequinum (Schreber, 1774)

This is a widely distributed and common species. It was recorded at 159 sites, mostly in natural underground objects, and much less in artificial objects – buildings and old mines. Nurseries were observed in small caves, at the entrances of larger caves and (outside of limestone areas) in the attics; they have usually numbered 100-350 individuals, sometimes mixed with *M. emarginatus*. In the winter it is found in underground roosts: the most often single individuals or groups of 10-15 individuals, but also hibernating colonies of 200-500 individuals were recorded. Largest winter colony recorded had at most 1.200 individuals. Short- and medium-distance seasonal migrations between the winter and summer roosts were registered.

Rhinolophus hipposideros (Bechstein, 1800)

This is a widespread species, common but never numerous, recorded at 111 sites, none in lowlands and river valleys. Breeding colonies, mostly observed in buildings (lofts or other uninhabited premises), have numbered 5-6 to approx. 30 individuals. In the winter period it's found only in underground roosts: usually single individuals, up to ca. 30 in one roost.

Rhinolophus mehelyi Matschie, 1901

This is rare cave-dwelling species. Only 2 roosts are known in two caves in Eastern Serbia. Estimated population in Serbia doesn't exceed 200 individuals.

Barbastella barbastellus (Schreber, 1774)

It is considered to be a relatively rare and never abundant species. 7 sites have been recorded up to now on the territory of Serbia: usually single specimens, occasionally 2-5, were found hibernating in caves or mist-netted at cave entrances during other seasons. A record of a single gravid female from Obedska Bara pond has been reported (Paunović *et al.* 2003). The known roosts are within altitudinal range from 70 to 1000 m, but the species obviously prefers cooler habitats of preserved riparian or mountain beech forests.

Eptesicus serotinus (Schreber, 1774)

This is a widespread and common species, but mostly single specimens have been recorded at 48 sites throughout the country. However, there is a lack of information about its bionomics and only one breeding roost in tree hollow in Central Serbia is recorded so far.

Myotis alcathoe von Helversen & Heller 2001

Recent researches have shown the presence of this species in Serbia, genetic analyses. So far it has been recorded at 4 sites. It could be common and widespread, but it is probably less abundant then *Myotis mystacinus s.s.* Targeted field research, as well as bionomy, morphology and genetics analyses are ongoing.

Myotis bechsteinii (Kuhl, 1817)

It is widespread species, but restricted to specific preserved forest habitats, recorded at 18 sites. Most of the records are single specimens mist-netted at the caves entrances or found hibernating in them. Single individuals have also been found hibernating in artificial underground objects such as old fortresses (e.g. Petrovaradin fortress, Novi Sad). A few specimens were mist-netted and ringed near forested rivulet bodies and in riparian forests. A gravid female was recorded at the first decade of July in Eastern Serbia.

Myotis blythii (Tomes, 1857)

It is known from 41 sites, typically natural caves, where mostly single specimens have been recorded, but several large nurseries also. The colonies are mostly mixed – with *M. myotis*, *M. capaccinii* and *M. schreibersii.* Revision of all known records and identification check of museum specimens are ongoing, as this species was formerly often mistaken for *M. myotis*.

Myotis brandtii (Eversmann, 1845)

The status of this species, recently found in Serbia for the first time, is still not known. Single specimens were recorded at 5 sites, 3 in the eastern and 2 in the western Serbia (Paunović *et* Karapandža, *in prep*).

Myotis capaccinii (Bonaparte, 1837)

It is common cave-dwelling species, recorded at 36 sites. It is found in limestone areas at lower altitudes all over the country. This species forms colonies in the caves, alone or together with other species, usually with *M. schreibersii*, *M. myotis*, *M. blythii*, but with other cave-dwelling species also. Mostly hibernates in large caves, often in those with underground water-streams. In Serbia colonies consist of as much as 4.000 individuals of this species in hibernacula and 200–1000 specimens in nurseries.

Myotis dasycneme (Boie, 1825)

There are only 3 records of this species in Serbia. First one is from beginning of the XX century at the park nearby the Palić Lake in far north of Province of Vojvodina, very near the Serbian-Hungarian border. Second record, more then 100 years after, was a single male mist-netted at the entrance of a cave in eastern Serbia in the summer of 1998. Third record was made by ultrasound detector in September 2001 at the Sava river bank near Kupinovo, Srem (Herman Limpens, *voce viva*). Preference of open water surfaces and specific way of life, as well as

insufficient amount of research in habitats suitable for this species, were obstacles for detection of this bat by traditional means of research. Further use of bat detectors could be of a great use in providing data on distribution and bionomy.

Myotis daubentonii (Kuhl, 1817)

This widely distributed species is found in whole country in suitable biotopes, most often at wetlands and near water bodies. A high abundance was recorded at a few wetlands in Eastern Serbia and Province of Vojvodina. It was reported at 33 sites. During the winter only a small number of single individuals have been found in caves, and it seems that this bat mostly hibernates in hollow trees. No summer roosts were recorded, but it's assumed that it uses hollow-trees during that period also.

Myotis emarginatus (Geoffroy, 1806)

This is relatively common and widespread species, but mostly not particularly abundant. There are 30 known sites. Summer roosts are known to be in buildings and caves; nursery colonies of 200-500 individuals are often mixed with *Rh. ferrumequinum*, or sometimes with *M. schreibersii* and *Rh. euryale*. During winter mostly single specimens have been found in caves.

Myotis myotis (Borkhausen, 1797)

It is one of the most abundant and widespread cave-dwelling bat species in Serbia, recorded at 46 sites. Throughout the year it has been found in natural and artificial underground shelters, churches and buildings. 12 large maternity roosts are known. Seasonal migrations between the winter and summer roosts were registered.

Myotis mystacinus (Kuhl, 1817) *sensu stricto*

This species is relatively frequent and widely distributed in Serbia. According to present knowledge on the species (Dietz *et al.* 2009) and recent genetic analyses of the specimens from Serbia, all the specimens previously identified as *Myotis aurascens* Kusjakin 1935, actually belong to this species, most likely to its Balkan subspecies *M. m. bulgaricus.* Typical *M. m. mystacinus* has also been recorded and it seems to be the less common and less abundant than *M. m. bulgaricus*, at least in areas south from Sava and Danube rivers, where the two forms usually occur together. So far 25 sites have been confirmed, all of them in woodlands where it seems to forage near forest edges, where it's been regularly mist-netted during all seasons, especially by the banks of temporary or permanent smaller water bodies. It has also been mist-netted at cave entrances.

Myotis nattereri (Kuhl, 1817)

The status is not known well enough, because it was quite rarely found in Serbia. It has been recorded at 13 sites, only 4 of those being small nurseries, while other records refer to single specimens or small groups.

Nyctalus leisleri (Kuhl, 1817)

Little is known about the status of the species. It's been found quite rarely; 9 sites have been recorded so far, 2 of which were reported previously (Miric *et* Paunovic 1997). Nevertheless, it might be present all over the country at suitable habitats, even quite numerous during migration. Most of the recorded specimens were mist-netted in the foraging areas during transitory periods and the summer.

Nyctalus noctula (Schreber, 1774)

It is widely distributed, common and abundant species, known from 106 sites. Hibernating colonies of few to few thousand of individuals were found in cracks and cavities in buildings and bridges, hollow-trees and in fissures in rocks at cave entrances. It' s been recorded throughout the

year, yet no certain data on breeding is known (only a doubtful single report from western Serbia).

Hypsugo savii (Bonaparte, 1837)

Although it is considered as a common and widespread species in limestone areas of Serbia at all altitudes, and in some parts of the city of Belgrade, only 19 sites have been recorded, 2 of which were reported previously (Miric *et* Paunovic 1995). Summer roosts have been found in rock crevices, as well as in the modern apartment buildings in the city of Belgrade; winter roosts have also been found in rock crevices and in the crevices at the cave entrances.

Pipistrellus kuhlii (Kuhl, 1817)

Although it was recorded in Belgrade for the first time only in 1994 (Paunović *et* Marinković 1998), there are many recent records in the cities and other human settlements of this anthropophilous species in Serbia. 46 sites are known and all the stages of life cycle have been observed. In last several years, special attention was paid to research on recorded replacement of species *Pipistrellus pipistrellus*, previously predominant in urban habitats, by this species.

Pipistrellus nathusii (Keyserling and Blasius, 1839)

In last several years this species have often been recorded during summer and transitory periods, mostly at foraging sites. Several specimens have been ringed. The species is known from 23 sites.

Pipistrellus pipistrellus (Schreber, 1774)

Although it is a common and widespread species, no studies of its biology and ecology were done. It is known from 56 sites, including both summer and winter roosts in buildings and caves. It is interesting that in human settlements, especially in large cities, during 1990's this species has been significantly replaced by *Pipistrellus kuhlii*. Researches on this relation and ecology of these two species are ongoing.

Pipistrellus pygmaeus (Leach 1825)

Taxonomic status of this species has been recently approved by International Commission for Zoological Nomenclature special committee decision (ICZN 2003). Up to now 18 sites, exclusively foraging areas, have been recorded in the region of Srem and in the vicinity of Belgrade, mostly by bat detectors. Revision of identification of specimens in museum collections, considering specimens of *Pipistrellus pipistrellus* is ongoing, because these two species haven't been distinguished until recently.

Plecotus auritus (Linnaeus, 1758) *sensu stricto*

All the specimens of *P. auritus* group from Serbia checked so far by genetics analyses and morphometry, museum specimens as well as those recently collected, have been proven to belong to this species. It is widespread all over the country, at both lowest and highest altitudes, but it's never numerous. Up to now it's been recorded at 20 sites, mostly in very different types of roost sites (underground, overground, artificial, natural...), but also at foraging places.

Plecotus austriacus (Fischer, 1829) *sensu stricto*

All the specimens of *P. austriacus* group from Serbia checked so far by genetics analyses and morphometry, museum specimens as well as those recently collected, have been proven to belong to this species. It is one of the most common and widespread species throughout the country, although the most of the records are single specimens. Up to now 46 sites has been recorded. It regularly hibernates in underground sites.

Vespertilio murinus Linnaeus, 1758

There are 22 records, mostly in buildings, most of them from the Belgrade and its surroundings, as well as records of single specimens from all around Serbia. There is no proof of breeding and wintering in Serbia so far, because most of the records derived from transitory periods.

Miniopterus schreibersii (Kuhl, 1817)

This is one of the common and widespread cave-dwelling bat species in Serbia, which forms very large colonies. Up to now 51 roosts were identified. It often shares the same roost sites (caves, old mines and fortresses) with *M. myotis*, *M. blythii and M. capaccinii*, usually forming mixed colonies with those species. Medium-distance seasonal migrations between the winter and summer roosts were registered.

List of species expected to be found in Serbia

(Paunović *et al.* 2004, modified according to more recent unpublished data)

Myotis aurascens Kusjakin 1935

Recent researches revealed that this species is not even closely that widely distributed in Europe as previously supposed, since most of the Balkan populations previously ascribed to this species proven to belong to *M. mystacinus*, most likely to Balkan form *M. m. bulgaricus* (Dietz *et al.* 2009). Recent genetic analyses from Serbia strongly support this, since all of the tested specimens have proven to be *M. mystacinus* (*bulgaricus*). However, since the recent discovery of this species in Bulgaria (Dietz *et al.* 2009) its presence in Serbia, although it's not likely, can't be completely ruled out.

Eptesicus nilssonii (Keyserling et Blasius, 1839)

This species is probably present in small numbers in suitable habitats and roost sites, most likely at higher altitudes.

Nyctalus lasiopterus (Schreber, 1780)

According to data on its distribution and ecology this species is very likely to be found in suitable forest habitats, possibly all around the Serbia.

Plecotus kolombatovici (Djulic, 1980)

According to current data on its distribution and ecology, this species might be expected in Serbia, but not as likely as *P. macrobullaris*. Traditional taxonomic analyses and genetics analyses of the genus *Plecotus* are ongoing, but the presence of this species is Serbia is not confirmed yet.

Plecotus macrobullaris Kuzjakin 1965

According to current data on its distribution and ecology, this species is very likely to be found in Serbia. Traditional taxonomic analyses and genetics analyses of the genus *Plecotus* are ongoing, but the presence of this species is Serbia is not confirmed yet.

Tadarida teniotis (Rafinesque, 1814)

The presence of this species has recently been confirmed in Montenegro, Bosnia and Herzegovina, Macedonia and Bulgaria. It is expected to be found in termophilous limestone area of the Eastern, Western and Southern Serbia, especially in certain sites within canyons and gorges.

2. Status and Trends

Table 1 presents threat status at national level, assessed according last IUCN criteria (IUCN 2001, 2003) and processed by RAMAS® Red List software, assessments of previous and current population trends and recorded breeding in Serbia (Paunović *et al.* 2004, modified according to more recent unpublished data).

Table 1 - Status and Population Trends of Bats in Serbia

Species	**Status**	**Pop. trend 2002**	**Pop. trend 2009**	**Breeding recorded**
Rhinolophus blasii Peters, 1866	NT	Stable	Same	Yes
Rhinolophus euryale Blasius, 1853	NT	Stable	Same	Yes
Rhinolophus ferrumequinum (Schreber, 1774)	LC	Stable	Same	Yes
Rhinolophus hipposideros (Bechstein, 1800)	NT	Stable	Same	Yes
Rhinolophus mehelyi Matschie, 1901	EN	Unknown	Same	Yes
Barbastella barbastellus (Schreber, 1774)	VU	Stable/Declining	**Stable**	Yes
Eptesicus serotinus (Schreber, 1774)	LC	Stable/Declining	**Stable**	Yes
Hypsugo savii (Bonaparte, 1837)	LC	Stable	Same	Yes
Myotis alcathoe von Helversen & Heller 2001	DD	-	**Unknown**	Yes
Myotis bechsteinii (Kuhl, 1817)	NT	Declining	**Stable**	Yes
Myotis blythii (Tomes, 1857)	LC	Stable	Same	Yes
Myotis brandtii (Eversmann, 1845)	DD	Unknown	Same	Doubtful
Myotis capaccinii (Bonaparte, 1837)	LC	Stable/Declining	**Stable**	Yes
Myotis dasycneme (Boie, 1825)	DD	Unknown	Same	No
Myotis daubentonii (Kuhl, 1817)	LC	Stable/Increasing	**Increasing**	Doubtful
Myotis emarginatus (Geoffroy, 1806)	NT	Declining	**Stable/Declining**	Yes
Myotis myotis (Borkhausen, 1797)	LC	Stable/Declining	**Stable**	Yes
Myotis mystacinus (Kuhl, 1817) *sensu stricto*	LC	Stable	Same	Yes
Myotis nattereri (Kuhl, 1817)	NT	Unknown	**Stable**	Yes
Nyctalus leisleri (Kuhl, 1817)	LC	Stable	Same	No
Nyctalus noctula (Schreber, 1774)	LC	Stable	Same	Doubtful
Pipistrellus kuhlii (Kuhl, 1817)	LC	Increasing	Same	Yes
Pipistrellus nathusii (Keyserling & Blasius, 1839)	LC	Stable/Declining	**Stable**	No
Pipistrellus pipistrellus (Schreber, 1774) *s. stricto*	LC	Declining	**Stable/Declining**	Yes
Pipistrellus pygmaeus (Leach 1825)	DD	-	**Stable**	Yes
Plecotus auritus (Linnaeus, 1758) *sensu stricto*	NT	Stable	**Stable/Declining**	Yes
Plecotus austriacus (Fischer, 1829) *sensu stricto*	LC	Stable	**Stable**	Yes
Vespertilio murinus Linnaeus, 1758	LC	Stable	**Increasing**	No
Miniopterus schreibersii (Kuhl, 1817)	LC	Stable	Same	Yes

3. Habitats and Roost Sites

Bats in Serbia were recorded at about 540 roost sites. Most data are available on underground roost sites, while data on habitats as well as on roosts in anthropogenous objects and especially in trees are scarce. Only since the last decade of previous century researches have been systematic, data more complete and appropriately analyzed. The ecological studies on bats and their habitats have mostly just started.

4. Threats

Table 2 shows classification of the threat factors by different types of bat roost sites and habitats present in Serbia.

Table 2 – Main threats to bat roost sites and habitats in Serbia.

		Factors of threat	
Roost sites	Underground (natural and artificial)	Disturbance	Fire
			Noise
			Research
			Use of excrements (bat guano)
		Direct killing	Vandalism
			For mystic and magical purposes
			For collections
		Inappropriate protection of roost sites	Building the wall at the entrance of shelters
			Unsuitable iron bars at the entrances
			Setting of lights
			"Tidying" for tourism
		Change of use	Closing of caves
			New purposes of the shelters
	Other artificial	Destruction of suitable buildings	
		Accidental poisoning	
		Disturbance	
		Deterioration	
		Limit of trophic resources	
Habitats		Chemical pollution	Industry
			Pesticides (insecticides)
		Habitat changes	Forest devastation and cutting
			Producing of forest clearings
			Intensive agriculture
			Arranging the banks of channels and rivers

5. Data Collection

Data have been collected by a few specialists in national scientific institutions. There is no officially responsible institution for collection and evaluation of data concerning bat conservation and management, and efforts should be made to assure effective collection and management of data in the future. The largest database and collections of bat specimens are deposited in Natural History Museum, Belgrade. The NGO Wildlife Conservation Society *Mustela* works towards collection of data related to bat conservation, including database of the roost sites, relevant legislation, etc.

C. Measures Taken To Implement Article III of the Agreement

6. Legal measures taken to protect bats, including enforcement action

- Previously Serbia has ratified the following international conventions relevant to bat conservation:

  - C. on Wetlands of International Importance especially as Waterfowl Habitat (1977)
  - C. on the Biological Diversity (2001)

- C. on International Trade in Endangered Species of Wild Fauna and Flora (2001)
- C. on the Conservation of Migratory Species of Wild Animals (2007)
- C. on the Conservation of European Wildlife and Natural Habitats (2007)

- Responsible ministries still study and prepare ratification of the Agreement on the Conservation of Bats in Europe (EUROBATS)

- Brief overview of previous national legislation related to bat protection:
  - 22 bat species were protected by Decree on Protection of populations of bats by the State (Sl. glasnik 1961): *Rh. ferrumequinum, Rh. hipposideros, Rh. euryale, M. myotis, M. dasycneme, M. oxygnathus, M. capaccinii, M. daubentonii, M. bechsteinii, M. mystacinus, M. emarginatus, M. nattereri, V. murinus, E. nilssonii, E. serotinus, N. leisleri, N. noctula, N. lasiopterus, P. pipistrellus, B. barbastellus, P. auritus and M. schreibersii.*
  - In the Province of Vojvodina in 1977 the fine was introduced for destroying bats (of 500 dinars apiece)
  - In the province of Kosovo and Metohija from 1977 there is Decree of protection of natural rarities that included protection of all bat species, i.e. representatives of two families – Rhinolophidae and Vespertilionidae.
  - In 1990 22 mentioned bat species are declared protected under the Decision on Protection of Animal Species as Natural Rarities (Sl. glasnik 1990).
  - The new Law on Environmental Protection has taken effect in 1991, and the corresponding Directive on Protection of Natural Rarities (Sl. glasnik 1993) has passed in 1993. It prohibited "to destroy, catch, harm, disturb, export or mount specimens of protected species", as well as "to destroy or endanger their habitats". Same 22 bat species has been listed and placed in Category I of protection, as the most strictly protected.

- Actual national legislation related to bat protection:
  - The new Law on Protection of Nature (Sl. glasnik 1993), fully harmonized with relevant international conventions that Serbia ratified and with EU Habitat Directive has passed on 19th May 2009 (Sl. glasnik 2009). It has fully taken effect since February 5th when Regulation on Declaration and Protection of Strictly Protected and Protected Species of Wild Plants, Animals and Fungi (Sl. glasnik 2010) under that Low has passed. 28 bat species (all of the bat species of Serbia except for *M. alcathoe* that has been discovered in Serbia recently earlier) has been listed in Annex I of the Regulation, as strictly protected species.

- Other official documents
  - Biodiversity of Yugoslavia with the review of Internationally Important Species (1995): The conservation of bat species and their habitats is declared as priority. 25 bat species are listed and their zoogeographical and ecological preferences analyzed.
  - The Preliminary Red List of Vertebrata of Serbia (1991): 22 bat species are listed. The Update, the Red List and the Red Book of Vertebrates of Serbia are still ongoing projects (see point 12, paragraph 8).
  - Diversity of bats in Serbia, a study base of national action plan for conservation (Paunović *et al.* 2004a). Initiated by Natural History Museum, Belgrade, accepted and supported by Ministry of science and environmental protection of Serbia, Directorate of environmental protection

7. Sites identified and protected which are important to the conservation of bats

In Serbia the bats are known at more then 530 roost sites and more than 200 sites that can not be declared as roosts. Until now only underground roosts (natural caves) have been declared as protected sites important for the conservation of bats. The process of identification of important bat sites is ongoing.

Important bat roosts and habitats occur on the territory of more than 1000 protected natural assets, covering surface of 500.000 ha.

Since 1949 till today, over 30 natural speleological objects were protected by law, most of which are important bat roost sites and thereby important for conservation of bats. By special decrees in 1956 and 1977 Baćina Pećina cave and Ribnička Pećina cave, respectively, have been protected as bat shelters exactly.

8. Consideration given to habitats those are important to bats

Roost sites

Although many roost sites are protected by law, they are usually not managed considering needs of bats. On the other hand, lack of control and permanent monitoring by responsible bodies, as well as lack of appropriate financing, deteriorate the preservation of those sites and their suitability for bat life.

Foraging sites

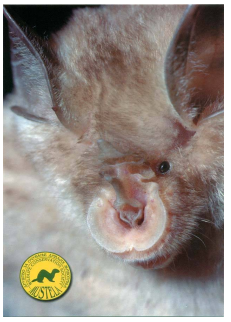
No special considerations have been given yet to protect foraging sites of bats. So far they are protected almost exclusively due to some wider importance (for example, biodiversity conservation), or due to importance for some other representatives of living or non-living nature.

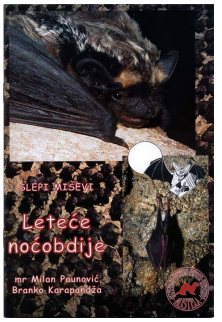
9. Activities to promote the awareness of the importance of the conservation of bats

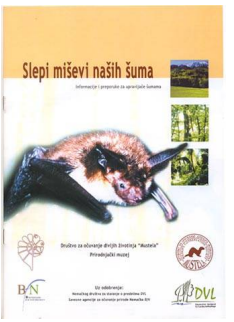
All activities to promote the awareness of the importance of the conservation of bats in Serbia have been carried out by the Wildlife Conservation Society *Mustela* and by Natural History Museum, Belgrade.

Publicity materials published:

- Leaflet: The Bats. What we know about them, WCS *Mustela* 2001 (still available).
- Postcard: Portrait of *Rhinolophus blasii*, WCS *Mustela* 2001 (still available).
- Booklet: The Bats – flying night–dwellers, WCS *Mustela* 2003.
- Documentary film: Flying night-dwellers, Radio Television Serbia 2003.
- Booklet: Bats in Forests, MUSTELA, NHM, 2004 (courtesy of Deutscher Verband für Landschaftspflege – DVL and Bundesamt für Naturschutz – BfN, with assistance of UNEP-EUROBATS) (still available).
- Many articles in newspapers and journals, WCS *Mustela*, NHM, 2000-2007.
- Leaflet: The Bats. Our Next-door Neighbors, WCS *Mustela* 2006, Reprint, 2008
- Info board: The Bats of the Lazareva Pećina Cave, WCS *Mustela*, NHM 2007







- Leaflet: The Bats. Our Next-door Neighbors, WCS *Mustela* 2009 (within the project with Dutch Mammal Society financed by the Dutch Ministry of Agriculture, Nature and Food Quality)

- Poster: The Bats. Our Next-door Neighbors, WCS Mustela 2009 (within the project with Dutch Mammal Society financed by the Dutch Ministry of Agriculture, Nature and Food Quality)

Media

A number of TV, radio, newspapers and magazine appearances and coverage concerning bats have been made, especially on the occasion of European Bat Night.

Education:

- Bat-workers school and training

  Usual Bat-workers school and training has not been organized this year by WCS Mustela. Still, lectures and field-practice for limited number of interested students has been organized during field research and other on-going activities, while they could have learnt and practiced bat survey, handling and identification, guided by experienced bat-workers from Serbia.

- In the frame of educational activities, WCS *Mustela* and Natural History Museum, both from Belgrade, during last 15 years have provided more then 180 lectures, slide presentations and performances of popularization of bats in all levels of schooling, from kindergarten through elementary, middle and high schools to university level, as well as those for the general public.

- European Bat Night (EBN) in Belgrade

  WCS *Mustela* and Natural History Museum have organized the European Bat Night for the 10th time in Serbia in 2009. The manifestation of 13th EBN was held on September 26th, beginning at 8 p.m., in the Gallery of Natural History Museum in Belgrade, situated in the largest Belgrade park, Kalemegdan. The performance included two main lectures and multimedia shows, followed by long interaction with audience as well as a display of live bats and possible contact with them. More than 250 persons of all ages were present. The

public traditionally reacted very positively on presented details from bat life. The EBN was announced in daily newspapers, and well covered by TV, radio and newspaper reports by journalists present. As usually, right after the EBN many people contacted the lecturers in order to present their own experiences on bats.

10. Responsible bodies nominated for the provision of advice on bat conservation and management

- The body responsible for nature conservation and environmental protection in Serbia is Ministry of Environment and Spatial Planning (MESP).

- Many protected areas, including some protected bat caves and/or karst (limestone) landscapes are managed by Ministry of Agriculture, Forestry and Water Resources of Serbia.

- Institutions providing scientific information and consultancy are Natural History Museum Belgrade and Institute of Nature Protection of Serbia.

11. Additional action undertaken to safeguard populations of bats

- At the beginning of 2001, 20 bat boxes were set within the National Park Fruška gora on locality Brankovac. 40 bat boxes were set in three parks in Belgrade during 2006.

- Natural History Museum, Belgrade, and WCS *Mustela* permanently work on surveillance of urban bat populations, especially in Belgrade, but also in other larger cities of Serbia. Bat teams of these institutions answer the calls regarding bats, always pursuing active demystification and education. Also, permanent surveillance of main roost sites throughout the Serbia was established by mentioned institutions.

12. Recent and ongoing programs relating to the conservation and management of bats

- 2000-2008 Surveillance of important bat roosts in Valjevo area, Serbia; realized by WCS Mustela and Society of Young Researchers of Belgrade, three times a year, financed through the own funds of these societies.

- 2001-2003, 2006-2008 Bat-workers trainings, including workshops and field-practice in areas that are diversity centers of bat fauna in Serbia; realized by WCS Mustela; financed through the own funds of WCS Mustela.

- 2002-2005: Annual youth biology research camps “Mammal Diversity of Durmitor and Tara gorge” with special attention to bat fauna; village of Tepca, Montenegro, in July, realized by Researchers Society “Vladimir Mandić – Manda”, Valjevo, and Society of Young Researchers of Belgrade.

- 2006-2007: Annual youth biology research camps “Mammal Diversity of Tara mountain National Park”, in July, realized by Researchers Society “Vladimir Mandić – Manda”, Valjevo, and Young Researchers of Belgrade Society.

- 1996-1998, 2004-2007: Project: "Diversity of Mammal Fauna of the Beljanica Mountain", with special attention to bat fauna; Beljanica Mountain, Eastern Serbia, in July, realized by Biology Students' Research Society "Josif Pančić".

- 2008-2010: Project: "Diversity of Mammal Fauna of the Grza River Gorge and its Surrounding", with special attention to bat fauna; Grza River Gorge, Eastern Serbia, in July and April, realized by Biology Students' Research Society "Josif Pančić".

- 2003-2004: Project "Diversity of bats in Serbia. National Action plan for conservation and preparation to accessing international documents". Project of Natural History Museum, Belgrade, sponsored by Ministry of Science and Environmental Protection of Serbia, Directorate of Environmental Protection.

- 2003-2004: "Applicative potentials and ecological aspects of protection of Serbian mammal fauna". Project of Biological faculty, University of Belgrade, in co-operation with Natural History Museum, Institute for biological research "Siniša Stanković", both from Belgrade, and Faculty of Natural Sciences, University of Kragujevac, sponsored by the Ministry of Science and Environmental Protection of Serbia, Directorate of Environmental Protection.

- 2003-2006...: Project "Red data book of Vertebrates of Serbia". Project of Natural History Museum, Belgrade, in co-operation with Biological faculty and Institute for biological research "Siniša Stanković", both from Belgrade, sponsored by Ministry of Science and Environmental Protection of Serbia, Directorate of Environmental Protection. Project is on hold since the end of 2006, because of the lack of finances.

- 2002-2004: Project No. 1864: „Assessment of status and changes in biological and geological diversity of modified landscape on the example of central parts of Serbia (Šumadija)", sponsored by the Ministry of Science and Environmental Protection of Serbia, Directorate of Science. The project will be extended during 2005.

- 2002-2004: Project No. 1525: "Inventory, monitoring and evaluation of faunal components in integral protection of biodiversity". Project of Biological faculty, University of Belgrade, in co-operation with Natural History Museum, Institute for biological research "Siniša Stanković", both from Belgrade, and Faculty of Natural Sciences, University of Kragujevac, sponsored by the Ministry of Science and Environmental Protection of Serbia, Directorate of Science. The project was extended during 2005.

- 2007-2008: Project "Distribution of bats infestation by EBLV in Serbia". Project of Pasteur Institute, Novi Sad, Serbia, in co-operation with Natural History Museum, sponsored by the Ministry of Agriculture, Forestry and Water resources of Serbia, Directorate of Veterinary Medicine. On the basis of this project a paper „Passive and Active Surveillance of Lyssaviruses in Bats in Serbia" has been presented at „2nd International Berlin Bat Meeting: Bat Biology and Infectious Diseases" this February and the abstract is available in symposium proceedings (Vranješ *et al.* 2010). In shortest, all of the 311 bat specimens sampled for blood and saliva all over the country, as well as 82 previously collected brain samples, proven negative for presence of lyssaviruses.

- 2008-2010: Project „Inventory, monitoring and conservation of bat and other mammal fauna of selected protected natural assets in Belgrade (Pionirski Park, Akademski Park, Banjička Šuma Forest, Veliko Ratno Ostrvo Island)". Project realized by Natural History Museum and WCS Mustela, ordered and financed by Belgrade public municipality enterprise that manages those protected areas.

- 2009-2011: Project "Bats and environmental impact assessment: tools for implementation of the European Habitat Directive and Eurobats agreement in Serbia. Project of Wildlife Conservation Society "Mustela", Belgrade, Serbia, with Zoogdiervereniging VZZ - Dutch Mammal Society, The Netherlands, financed by the Dutch Ministry of Agriculture, Nature and Food Quality. The project activities are supported by the Serbian Ministry of

Environmen and Spatial Planning, Natural History Museum, Belgrade, Serbia and Institute for Nature Conservation, Belgrade, Serbia.

D. Functioning of the Agreement

13. Co-operation with other Range States

Wildlife Conservation Society "Mustela" from Belgrade, Serbia closely colaborates with Dutch Mammal Society on Project "Bats and environmental impact assessment: tools for implementation of the European Habitat Directive and Eurobats agreement in Serbia", financed by the Dutch Ministry of Agriculture, Nature and Food Quality and supported by the Serbian Ministry of Environmen and Spatial Planning.

Co-operation mainly remained on personal level, especially intense with colleagues from Slovenia, Bosnia and Herzegovina and Montenegro.

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