

THE AGREEMENT ON THE CONSERVATION OF
POPULATIONS OF EUROPEAN BATS
(EUROBATS)

**Fifth National Report on the Implementation of the
Agreement**

Croatia

September 2006 – June 2010

Ministry of Culture of the Republic of Croatia, Nature Protection Directorate
&
State Institute for Nature Protection
June 2010

A. GENERAL INFORMATION

Name of Party:	Hrvatska (Croatia)
Date of report:	June 2010
Period covered:	September 2006 – May 2010
Competent Authority:	Ministry of Culture of the Republic of Croatia, Nature Protection Directorate (MC, NPD) www.min-kulture.hr Ms Zrinka Domazetović (administrative focal point) Runjaninova 2, HR-10000 Zagreb Tel: + 385 1 48 66 127; +385 1 48 66 102 Fax: + 385 1 48 66 100 e-mail: zrinka.domazetovic@min-kulture.hr
Appointed members of the Advisory Committee: (2009)	Dr Nikola Tvrković (scientific focal point until March Croatian Natural History Museum (CNHM) www.hpm.hr Demetrova 1, HR-10000 Zagreb Tel: + 385 1 48 51 700 Fax: + 385 1 48 51 644 e-mail: nikola.tvrkovic@hpm.hr Mr Aljoša Duplić (scientific focal point since March 2009) State Institute for Nature Protection (SINP) www.dzzp.hr Trg Mažuranića 5, HR-10000 Zagreb Tel: +385 1 55 02 923 Fax: + 385 1 55 02 901 e-mail: aljosa.duplic@dzzp.hr M Sc Daniela Hamidović (AC13 Romania; AC14 Cyprus; AC15 Bonn) Ministry of Culture of the Republic of Croatia, Nature Protection Directorate (MC, NPD) Runjaninova 2, HR-10000 Zagreb Tel: + 385 1 48 66 130; +385 1 48 66 102 Fax: + 385 1 48 66 100 e-mail: daniela.hamidovic@min-kulture.hr

Members of following Advisory Committee Intersessional Working Groups (updated List of IWG members from 14th AC Meeting, Tochni / Larnaca, Cyprus, 11 – 13 May 2009) are:

- *Producing Guidelines on Bat Monitoring Methods to Assess Population Trends at Different Levels* – M Sc Daniela Hamidović
- *Autecological Studies for Priority Species* – M Sc Daniela Hamidović
- *Bats as Indicators* – M Sc Daniela Hamidović
- *Light Pollution* – M Sc Daniela Hamidović
- *Code of Ethics* – M Sc Daniela Hamidović
- *EUROBATS Projects Initiative (EPI)* – M Sc Daniela Hamidović (sub-committee member)
- *Pan-European Monitoring Project for Underground Sites (PEMBUS)* – M Sc Daniela Hamidović
- *White-Nose Syndrome* – M Sc Daniela Hamidović

Abbreviations:

BIUS – Biology Students Association

CBSS – Croatian Biospeleological Society

CNHM – Croatian Natural History Museum

EBN – European Bat Night

EBRS – European Bat Research Symposium

EIA - Environmental Impact Assessment

EPEEF – Environmental Protection and Energy Efficiency Fund

IWG - Advisory Committee Intersessional Working Group

MC-NPD – Ministry of Culture of the Republic of Croatia, Nature Protection Directorate

NIA - Nature Impact Assessment

SINP – State Institute for Nature Protection

B. STATUS OF BATS WITHIN THE TERRITORY OF THE PARTY**1. Summary Details of Resident Species**

Out of 35 bat species recorded in Croatia 28 are resident, 1 is probably extinct and for remaining 6 species the status is uncertain. Breeding is confirmed in 24 species and hibernation in 19 species (Table 1). 13 species recorded in Croatia are listed in the Annex II of the Habitats Directive (*Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora*) (Table 2).

Table 1. List of bat species recorded in Croatia (changes from the last National report are marked in **bold**).

No.	Species	Resident	Evidence of breeding	Evidence of wintering	Supposed status
1.	<i>Rhinolophus blasii</i>	Yes	Yes	Yes	Rare
2.	<i>Rhinolophus euryale</i>	Yes	Yes	Yes	Common
3.	<i>Rhinolophus ferrumequinum</i>	Yes	Yes	Yes	Very common
4.	<i>Rhinolophus hipposideros</i>	Yes	Yes	Yes	Very common
5.	<i>Rhinolophus mehelyi</i>	No (probably extinct)	No	No	Probably extinct
6.	<i>Barbastella barbastellus</i>	Yes	Yes	Yes	Common
7.	<i>Eptesicus serotinus</i>	Yes	Yes	Yes	Common
8.	<i>Eptesicus nilssonii</i>	Migration/resident?	No	No	Rare
9.	<i>Hypsugo savii</i>	Yes	Yes		Very common
10.	<i>Miniopterus schreibersii</i>	Yes	Yes	Yes	Common
11.	<i>Myotis alcaethoe</i>	Resident?	No	No	Rare
12.	<i>Myotis aurascens</i>	Resident?			Common
13.	<i>Myotis bechsteinii</i>	Yes	Yes	Yes	Common
14.	<i>Myotis blythii</i>	Yes	Yes	Yes	Very common
15.	<i>Myotis brandtii</i>	Yes	Yes		Common
16.	<i>Myotis capaccinii</i>	Yes	Yes	Yes	Common
17.	<i>Myotis dasycneme</i>	Hibernation/ resident?	No	Yes	Rare
18.	<i>Myotis daubentonii</i>	Yes	No	Yes	Very common
19.	<i>Myotis emarginatus</i>	Yes	Yes	Yes	Very common
20.	<i>Myotis myotis</i>	Yes	Yes	Yes	Common
21.	<i>Myotis mystacinus</i>	Yes	Yes		Common
22.	<i>Myotis nattereri</i>	Yes	Yes	Yes	Rare
23.	<i>Nyctalus lasiopterus</i>	Migration/ resident ?	No		Rare
24.	<i>Nyctalus leisleri</i>	Yes	No		Common
25.	<i>Nyctalus noctula</i>	Yes	Yes	Yes	Very common
26.	<i>Plecotus austriacus</i>	Yes	Yes		Rare

27.	<i>Plecotus auritus</i>	Yes	Yes	Yes	Very common
28.	<i>Plecotus kolombatovici</i>	Yes	Yes	No	Common
29.	<i>Plecotus macrobullaris</i>	Yes	Yes	Yes	Common
30.	<i>Pipistrellus kuhlii</i>	Yes	Yes	Yes	Very common
31.	<i>Pipistrellus nathusii</i>	Yes			Common
32.	<i>Pipistrellus pipistrellus</i>	Yes			Common
33.	<i>Pipistrellus pygmaeus</i>	Yes	Yes		Very common
34.	<i>Tadarida taeniotis</i>	Yes	Yes		Common
35.	<i>Vespertilio murinus</i>	migration/resident?	No	No	Rare

Data on some species is scarce. References for information on breeding and wintering in Table 1 are stored in the State Institute for Nature Protection.

2. Status and Trends

Out of 17 bat species listed in the Red Book of Mammals (Tvrtković N., ed., 2006), 12 are included in the Annex II and all bat species recorded in Croatia are in the Annex IV of the Habitats Directive (Table 2). Population trend of selected species cannot be specified in statistically significant way yet. However, there are several sites (caves mostly) that are being regularly monitored for the past 10 years and provisional results indicate that the number of bats in these sites is stable for some species. The list of identified sites important for bats is growing.

Table 2. List of threatened bat species in Croatia (species listed in the Annex II of the Habitats Directive marked in **bold**).

No.	Species	IUCN National Category*
1.	<i>Rhinolophus blasii</i>	VU
2.	<i>Rhinolophus euryale</i>	VU
3.	<i>Rhinolophus ferrumequinum</i>	NT
4.	<i>Rhinolophus hipposideros</i>	NT
5.	<i>Rhinolophus mehelyi</i>	RE?
6.	<i>Barbastella barbastellus</i>	DD
7.	<i>Miniopterus schreibersii</i>	EN
8.	<i>Myotis bechsteini</i>	VU
9.	<i>Myotis capaccinii</i>	EN
10.	<i>Myotis dasycneme</i>	DD
11.	<i>Myotis emarginatus</i>	NT
12.	<i>Myotis myotis</i>	NT
13.	<i>Nyctalus leisleri</i>	NT
14.	<i>Nyctalus lasiopterus</i>	DD
15.	<i>Plecotus austriacus</i>	EN
16.	<i>Plecotus kolombatovici</i>	DD
17.	<i>Plecotus macrobullaris</i>	DD

* Tvrtković N., ed. (2006): Red book of mammals of Croatia. MC & SINP. Zagreb

3. Habitats and Roost Sites

Underground sites are used throughout the year either for maternity roosts, hibernacula, swarming sites or transient roosts. Number of underground sites important for bats is increasing from year to year because of the growing number of bat researchers and ongoing bat research done by several organisations. Number of important underground sites is larger for maternity roosts and these are mostly located in the submediterranean karstic area. There are also some recorded in the continental region, containing several thousands of individuals of few bat species. High number of bats in underground sites is expected since karst is spread on 51% of Croatian land territory. Additionally, some sites are recorded in man-made objects, such as abandoned houses, attics, mines, caverns, castles, churches etc. Forest dwelling bat species

are not thoroughly researched and data on these species are scarce or lacking. Data on most sites with bat colonies is deposited in the SINP database and is continuously updated.

4. Threats

Bats in Croatia are facing threats recorded in many European countries, with the most significant being focused on roosts destruction and hunting habitat deterioration:

- destruction of underground habitats due to hydropower plant construction (cave sinking) and other infrastructural projects
- destruction of roosts in man made objects due to reconstruction of houses, factories, castles, churches (demolition, maintenance or alterations)
- habitat destruction, deterioration and fragmentation (roads and highways, inadequate spatial planning in regards to bats): loss of commuting routes and feeding habitats
- inadequate water management: emission of waste waters without proper purification treatment into the waterways or directly into karst, alteration of waterways and drainage
- illegal waste disposal in caves and pits
- intensive agriculture: pesticides overuse (loss of prey, loss of hunting habitats, bioaccumulation in bats)
- inappropriate forest management (felling of old and dead trees or trees with holes)
- wind farms
- environmental pollution
- light pollution
- lack of knowledge on successful mitigation approaches
- disturbance in roosts (e.g. visits to caves easily approached by tourists).

In June 2010 the important underground habitat Dragina cave was flooded due to the construction of a hydropower plant and a dam. Since there was a maternity colony of several species in this cave, an additional expert study was required by the Bern convention (Recommendation No.129 (2007) on the construction of a dam and hydroelectric power station in Lešće on the Dobra River), to set up additional mitigation or compensation measures for bats and speleological objects in the affected area. The study on bats and subterranean fauna submitted in 2009 by Elektroprojekt d.d., for which the Croatian Biospeleological Society was contracted, included all speleological objects in the area of 1 km from river Dobra in the affected area, larger objects in the area of 3 km from the river and some objects more than 10 km from the river, in order to determine possible alternative habitats for bats from Dragina cave. Based on the recommendations from the study, two cave entrances has been shut at the end of February and at the beginning of March to prevent bats from entering. Several caves in the area with important bats roost and subterranean fauna were proposed for higher level of legal protection and monitoring of bats in potential refugia was suggested. Additionally, two rivers in the area were suggested for stricter protection in order to preserve hunting habitats. In April 2010 Croatia informed Eurobats Secretariat about the removal of Dragina cave from the list of important underground habitats.

In regards to the planned construction of the underground hydropower plant Ombla, where there is the important underground habitat Vilina cave with a maternity colony of several species, an additional expert study on bats was required. The expert study from December 2008 done by the Faculty of Science of the University in Zagreb, Biological Department, proscribes the construction of drainage channels, to ensure that the parts of the cave with bat colonies will not be flooded in case of water drainage from the surrounding subterranean area, and monitoring of bat fauna during the construction works and the operation of the underground hydropower plant.

5. Data collection, analysis, interpretation and dissemination

The Ministry of Culture is the responsible authority for nature protection in Croatia. According to the Article 67 of the Nature Protection Act (OG 70/05, 139/08), bat research may be carried out based on a permit from the Ministry, which sets out the nature protection requirements. A legal entity or natural person who carried out the research must report the results of the research to the Ministry and the State Institute for Nature Protection within thirty days from the date of research completion on a yearly basis.

The State Institute is responsible for expert tasks of nature protection – data collection and processing, establishment and maintenance of relevant data bases, monitoring the conservation status of biological and landscape diversity and proposing the conservation measures, drawing up the reports on the state and protection of nature, educational and promotional activities in nature protection.

Consistent and standardized monitoring methodology on national level isn't established so far, although SINP made the Manual for inventarisation and monitoring of bats in 2008. The Manual has protocols and field forms for surveillance and basic monitoring of species or groups of species which are easily recognised or identified by bat detector, so data can be gathered using non-invasive techniques. Currently, development of monitoring methodology for the purpose of reporting to the European Commission according to the Article 17 of the Habitat Directive is in progress.

Republic of Croatia should start at the end of 2010 the IPA project "Development of faunistic and speleological databases (CRO fauna and CRO speleo)", as part of the NPIS (Nature Protection Information System). This project aims at improving biodiversity data acquisition, organization and availability, as a basis for the efficient implementation of Natura 2000, in particular in regards to monitoring of Natura 2000 network and assessment activities. A specific assignment of this project is development of the faunistic database "CRO fauna" and speleological database "CRO speleo". All relevant data on bats should be entered and stored in this database from 2012 and further.

At this moment, majority of data collected by various organisations is stored in the existing SINP databases. SINP is using this data for defining future Natura 2000 proposal, evaluation of potential impact of certain environmental interventions on bats, proposals for new protected areas and management of the existing ones etc. In terms of data interpretation SINP is contacting Croatian bat experts/organisations depending on the analysis demand and target group/topic. Defining the Natura 2000 sites important for bats according to the criteria of the Annex III of the Habitat Directive is in progress. For bat species not listed in the Annex II of the Habitats Directive clear criteria for defining the important sites on the national level are not yet established.

Public institutions which govern protected areas or other protected natural values on county level also collect data on bats in their area and finance projects on bats.

C. MEASURES TAKEN TO IMPLEMENT ARTICLE III OF THE AGREEMENT

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

All 35 bat species recorded in Croatia are strictly protected by the Nature Protection Act (OG 70/05, 139/08) and the Ordinance on Proclamation of Wild Taxa as Protected and Strictly Protected (OG 99/09), same as all cave fauna including bat colonies in caves, but in practice this protection is hardly ever materialized. Misdemeanour provisions of the Nature Protection Act proscribe fines for deliberate capture, holding or killing of strictly protected animals, for deliberate disturbance particularly during the period of breeding, rearing young, hibernation or migration, and for deterioration or destruction of their breeding or resting sites. According to the Ordinance on the amount of indemnity for damage inflicted by unauthorised action on protected animal species (OG 84/96, 79/02), the indemnity tariff for killing a single bat is from 140 to 550 Euros (1.000,00 – 4.000,00 kunas), depending on the species.

The Ministry of Culture as a competent authority issues permits containing the nature protection requirements, for bat research and all activities in speleological objects.

Seventeen bat species are listed in the Red List of Endangered Plants and Animals of the Republic of Croatia.

Bat conservation action plans were included in the new Strategy and Action Plan for the Protection of Biological and Landscape Diversity of the Republic of Croatia from 2008, especially in regards to wind farms. However, management plan for any bat species in Croatia still does not exist. Analysis and as appropriate a revision of the implementation and enforcement of action plans foreseen by the Strategy will be made in 2013.

Based on the Regulation on Proclamation of the Ecological Network (OG 109/07), the Ecological Network of Republic of Croatia was proclaimed in 2007 on 47% of land and 39% of sea territory. It includes 28 sites for which bats are the conservation objective, so guidelines for protection measures aimed at maintaining or establishing a favourable conservation status are proscribed. All speleological objects also represent an integral part of the national Ecological Network of Republic of Croatia. The Nature Impact Assessment needs to be carried through for every project that can have a considerable impact on the conservation objectives and the integrity of the Ecological Network.

Since bats are strictly protected, they are also being viewed in a scope of the Environmental Impact Assessment (EIA) for projects that can have an impact on bats. EIA then needs to assess the impact on bats and give the mitigation measures to avoid a negative impact. The obligation to conduct the EIA study for certain types of projects is proscribed by law. The EIA procedure is under the jurisdiction of the national or local government, depending on the size of the project. The investors are obliged to finance the EIA study in order to obtain the relevant permits and to finance the mitigation measures and monitoring if proscribed by the EIA.

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

Most of sites important for bats are recorded in the SINP database (both man-made and underground sites). The Ecological Network of Republic of Croatia, proclaimed in 2007 by the Regulation on Proclamation of the Ecological Network, includes 28 sites with bats as target species (Table 3) and also all speleological objects that meet the definition of a speleological object in accordance with the Nature Protection Act.

Table 3: Number of sites in the Ecological Network of Republic of Croatia with bats as a key species in the conservation objectives.

Site type	number
Polygon	7
Point	21
Total	28

Current Natura 2000 proposal includes 55 locations with bat colonies. The Natura 2000 proposal is still in the working phase and is updated during public presentations, workshops and with additional scientific research (www.natura20000.hr).

Some of the sites important for bats are inside protected areas (strict reserve, national or nature parks, special nature reserves, nature monuments, important landscapes), where additional protection measures and management exist.

8. Consideration given to habitats which are important to bats

As highlighted previously, many habitats important for bats are included in the Ecological Network of Republic of Croatia – in some bats are listed as key species, and some are important as hunting or roosting habitats for bats, although conservation objective of the site is not directly connected to bats. Some of the examples of habitats included in the Ecological Network which are important to bats are:

- all speleological objects
- aquatic habitats – rivers, lakes, marshes, ponds, streams
- karst fields
- forest habitats

Ecological Network of the Republic of Croatia is covering 47% of land territory. This large percentage, together with the conservation objectives and guidelines for the protection measures aimed at maintaining or establishing a favourable status of threatened and rare habitat types and species, contributes to the conservation of habitats important to bats.

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

European Bat Night (EBN) events:

2007 – 11th anniversary of the European Bat Night

The 11th EBN was celebrated in the capital Zagreb, where Public Institution City Park Maksimir, Zagreb Zoo and Public Institution Nature Park Medvednica continued the tradition of organising Bat Night events.

On September 1st during the day in the city park Maksimir there were workshops for children and visitors had the opportunity to listen to bat sounds with bat detectors and learn about bats from bat experts. In the evening there was a "Bat party" in the Zagreb Zoo, with lectures, video presentations, educational workshops and the "extinct bat cemetery" installation. MC – Nature Protection Directorate, State Institute for Nature Protection, Croatian Biospeleological Society and Association for Bat Conservation Tragus presented their work and publications.

On September 2nd Public Institution Nature Park Medvednica offered free tours through the Veternica cave. During the guided tour visitors had a chance to see the bat roost and learn more about 14 bat species that dwell there. In front of the cave visitors were able to take part in the programme "Adopt a bat from the Veternica cave".

On the occasion of the 11th EBN the Public Institution Nature Park Biokovo posted on their web site an article on bat ecology and conservation demands.

2008 – 12th anniversary of the European Bat Night

The 12th anniversary of the EBN in Croatia was celebrated on 30th August in the capital Zagreb, in the Nature Park Kopački rit and in the town of Osijek, the regional centre of the eastern part of the country.

In Zagreb, the Public Institution Nature Park Medvednica offered free tours through Veternica cave. Some 500 to 600 visitors went on a 1 hour guided tour to see the bat roost and learn more about 14 bat species that dwell there. In front of the cave visitors were able to take part in the programme "Adopt a bat from Veternica cave".

The programme in Zagreb Zoo, organised in cooperation with the Public Institution City Park Maksimir, consisted of bat exhibitions, including the "extinct bat species cemetery", best bat mask competition and educational workshops and playgroups where visitors had the opportunity to listen to bat sounds with bat-detectors and learn about bats, their habitats and habits. State Institute for Nature Protection, Croatian Biospeleological Society and Biology Students Association BIUS - Bat Group presented their work and publications. Apart from this educational and fun part, the event had a humanitarian aspect also. The Croatian Institute for Transfusion Medicine set up a mobile station for voluntary blood donating under a motto "We are the only mammals in Europe that need your blood".

The Public Institution Nature Park Kopački Rit organised a celebration of the EBN in the Ludos forest for the media and artists from the art colony that took part in the Kopački rit at the same time. There was a presentation on EBN and bat species in Kopački Rit and a demonstration of bat detectors.

Also, for the first time the Bat Night took place in Osijek Zoo, organised by Unikom Ltd, which runs the Zoo, and the Association for Bat Conservation Tragus. The educational workshops included video and oral presentations about bats, demonstration of bat-detector together with the software that analyses bat sounds, and construction of bat houses. After dark, the visitors were able to listen to bats with bat-detectors, take part in Batman party under masks, see the magicians and juggling artists, and eat food and cocktails with bat names made up especially for this occasion.

2009 – 13th anniversary of the European Bat Night

The 13th EBN in Croatia was celebrated during the last weekend in August and on 5th September in the capital Zagreb, Nature Park Medvednica and Nature Park Kopacki Rit.

On the 28th the Public Institution Nature Park Medvednica offered traditional free tours through Veternica cave with the expert guidance. Visitors had a chance to learn more about 14 bat species that live there and take part in the programme "Adopt a bat from Veternica cave". A new documentary about Veternica cave was presented. Workshop organised for children included creating a bat origami, doing bat drawings and masks. Visitors had the opportunity to try bat cookies and buy bat souvenirs.

On the 29th the Public Institution Nature Park Kopacki Rit organised a presentation on bat species in Kopacki Rit and a demonstration of bat detectors.

Due to bad weather forecast for 29th, the programme in the Zagreb Zoo was postponed for Saturday September 5th. On evening walks through Maksimir Park, groups of visitors were able to listen to bats with the help of bat detectors and learn more about bats and their diet, bat habitats and their co-habitation with people, ways how to build a bat house, speleological research and much more. Bat exhibitions and video presentations, best bat mask competition and educational workshops and playgroups were organised. The State Institute for Nature Protection, the Croatian Biospeleological Society, the Biology Students Association BIUS and the Association for Bat Conservation Tragus presented their activities in bat conservation and research. There was once again the well accepted action of the Croatian Institute for Transfusion Medicine with a mobile station for voluntary blood donating.

Rehabilitation

Based on contract with the Ministry of Culture, there are currently 5 rescue centres in Croatia authorised for the keeping, healing and recovery of injured or diseased strictly protected animals, but not all are able to take in mammals and provide veterinary service for them. Animal rescue Centre AWAP reported on rehabilitation of some bats, mostly Pipistrelles. Falconry Rescue Centre Šibenik tried to cure Longfingered bat female and its young in 2008.

Education, lectures, exhibitions, publications:

State Institute for Nature Protection

- Participation at 11th, 12th and 13th EBN celebration
- Bookmark Protected species in Croatia – *Rhinolophus ferrumequinum* (2006) (<http://www.dzpz.hr/publikacije/ostale-publikacije/bookmarkeri-zasticene-vrste-hrvatske-594.html>)
- Bookmark Biodiversity of Croatia - *Plecotus kolombatovici* (2007) (<http://www.dzpz.hr/publikacije/ostale-publikacije/bookmarkeri-bioloska-raznolikost-hrvatske-595.html>)
- Bookmark Biodiversity of Croatia – *Rhinolophus ferrumequinum* (2007) (<http://www.dzpz.hr/publikacije/ostale-publikacije/bookmarkeri-bioloska-raznolikost-hrvatske-595.html>)
- Leaflet: Did you see them - Bats? (2007) (http://www.dzpz.hr/dokumenti_upload/20100310/dzpz201003101242090.pdf)
- Holcer D., Pavlinić I. (2008): Manuals for inventarisation and monitoring the status of species and habitats in Croatia; Chapter: Bats. (http://www.dzpz.hr/dokumenti_upload/20100316/dzpz_201003161547430.pdf)

Croatian National History Museum:

- Lecture on bats and caves during visits to Veternica cave with expert guidance, organised for biology students and general public in May 2009 and 2010
- Programme "From the Museum to Medvednica" in 2009 and 2010, with scientific lectures for general public about Medvednica Nature Park and its natural values in the fundus of CNHM and educational excursions – lecture on bats of Medvednica

Croatian Biospeleological Society (http://www.hbsd.hr/Onama_eng.html - CBSS Annual Reports)

- Lectures and workshops at 11th, 12th and 13th EBN celebration
- Lectures in 8 schools for more than 600 children living in the area near the biggest nurseries of the Longfingered bats as well as for mountaineers and cavers
- Lectures for general public and children as part of projects conducted through CBSS
- Lectures and workshop “Week of Natural History” at the Island of Korčula (15-21 March 2010)
- Participation at Museum Night 2010 organized by Natural History Museum Dubrovnik on 29th January 2010 - workshop, quizzes, presentation and bat masque bal
- Lecture for high school children from Krapina/Croatia and Germany for Environmental Networking – Young Europeans in Dialogue Project in June 2010
- Media coverage regularly on National and regional TV
- Bedek J., Cvitanović H., Mlačak K. (2009): World Under World: Cave Fauna Biodiversity in Ogulin and Kamanje – Globally Important Subterranean Heritage Hidden in Karlovac County, Croatian Biospeleological Society, educational exhibition for the Vrlovka Cave.
- Ozimec R., Hamidović D. (2009): Living cave treasure of Dubrovnik area, Photo exhibition of Croatian Biospeleological Society, permanent exhibition in Natural History Museum Dubrovnik since 2009.
- Conservation of the Longfingered Bat for the Conservation of karstic habitat in Croatia – posters and educational leaflets (Croatian and English)
- Bedek J., Bilandžija H., Hamidović D., Cvitanović H., Dražina T., Jalžić B., Jalžić V., Kovač Konrad P., Lukić M., Miculinić K., Ozimec R., Pavlek M. (2009): World Under World: Cave Fauna Biodiversity in Ogulin and Kamanje – Globally Important Subterranean Heritage Hidden in Karlovac County, Croatian Biospeleological Society, exhibition catalogue, (<http://www.hbsd.hr/vijesti/Svijet%20ispod%20svijeta%20katalog.pdf>).
- World Under World: Cave Fauna Biodiversity in Ogulin and Kamanje – Globally Important Subterranean Heritage Hidden in Karlovac County, leaflet, (<http://www.hbsd.hr/vijesti/Svijet%20ispod%20svijeta%20deplijan.pdf>)
- Jalžić B., Ozimec R., Bedek J., Hamidović D., Slapnik R., Franičević M., Lukić M., Bilandžija H. i Pavlek M. (2007): Subterranean fauna of the Krka National Park, Krka River and Krka National Park Symposium: Cultural and natural heritage, conservation and sustainable development, Šibenik 2005 (ed. D. Marguš), Book of Papers: 491-506.

Biology Students Association BIUS, Bat Group:

- Educational workshop "Secrets of flying mammals", for children in elementary schools (*January 2007 - present*)
- Lectures and workshops at 12th and 13th EBN celebration
- Workshops, quizzes, lecture and bat research techniques presentation on Biology Night on March 2009 and 2010 (Faculty of Science, University of Zagreb)
- Workshops, quizzes and bat research techniques presentation on the International Biodiversity Day celebration in Maksimir park on 22nd May 2010
- Lecture on bats and bat detector presentation on the celebration of the 2010 International Biodiversity Day in the Northern Velebit National Park .

Association for Bat Conservation Tragus:

- Lectures and workshops at 11th, 12th and 13th EBN celebration

- Leaflet “Bats in towns – Welcomed or uninvited guests?” prepared by the Public Institution City Park Maksimir and the Association for Bat Conservation Tragus (http://www.park-maksimir.hr/Maksimir_media/letak_digitalni.pdf)
- Lecture and workshop on bats and biodiversity for the elementary school teachers in Osjecko-baranjska county in 2008
- Workshop for school children in the “Young rangers” programme in Nature Park Lonjsko Polje, with the installation of bat boxes in 2009
- Lecture about bats, followed by building and installation of bat boxes for the ecology group in an elementary school in Zagreb in 2009 and 2010

Other:

- Public Institution Nature Park Medvednica continuously promotes bat conservation with the "Adopt a bat from Veternica cave" programme (http://www.pp-medvednica.hr/Medvednica_en/Medvednica_usvoji_sismisa_en.htm)
- in February 2008 bat expert Daniela Hamidović and Public Institution Nature park Medvednica participated in HRH Royal Princess Anne’s (UK) official visit, with the protocol arranged by Croatian President Office and British Embassy, when she visited Veternica cave promoting bat management and conservation activities in her role as a Patron of the Whitley Fund for Nature (UK).
- Hamidović D. (2009): DDD permanent education, Poisonous, irritating and detesting animals and bats Book of lectures, 91-97. (permanent education for contractors on mandatory measures of disinfection, desinsection and deratisation and for inspection - 3 lectures held so far)
- Hamidović D. (2007): Bats, invited lecture for the Public Open University in the Sova Programme

10. Responsible bodies, in accordance with Article III.5 of the Agreement, nominated for the provision of advice on bat conservation and management

Responsible body for the provision of advice on bat conservation and management has not been nominated yet. Questions and problems in regards to bats in buildings and other human settlements usually get directed to bat experts and NGOs, Croatian National History Museum, zoos, State Institute for Nature Protection, Nature Protection Inspection or Nature Protection Directorate in the MC.

Important bat habitats and roost sites inside the Ecological Network of the Republic of Croatia or protected areas are managed by public institutions governing protected natural values on county level or national and nature parks. These public institutions are responsible for adoption and implementation of management plans and annual programmes for protection, maintenance and conservation of the Ecological Network site or protected area. Management plans and annual programmes are subject to the approval of the Ministry and prior opinion of the State Institute for Nature Protection.

However, no management plans for the Ecological Network sites were adopted since the proclamation of the Ecological Network in 2007.

State Institute for Nature Protection also provides expert basis for the conservation measures and gives opinion when needed in the Nature Impact Assessment procedure for plans and programs that could have an impact on the Ecological Network. When the NIA procedure is conducted by the regional administration this opinion by SINP is obligatory.

11. Additional action undertaken to safeguard populations of bats

The Ministry of Culture, Nature Protection Directorate distributed EUROBATS publications to relevant parties:

- “Protecting and managing underground sites for bats“ in 2008 to bat experts, NGOs and public institutions governing protected areas;

- “Guidelines for consideration of bats in wind farm projects” in 2008 to agencies, companies and bat experts involved in the planning and environmental impact assessments of wind farms and in 2009 based on these generic guidelines also the national guidelines;
- “Protection of overground roosts for bats“ in 2010 to bat experts and NGOs, cultural heritage conservation departments, public institutions governing protected areas and county public institutions governing protected natural values on regional level;
- “Guidelines for Surveillance and Monitoring of European Bats” in 2010 to bat experts and NGOs, public institutions governing protected areas and county public institutions governing protected natural values on regional level.

In regards to caves with bats open for tourism, the nature protection conditions proscribed by a concession approval to use a speleological object for economic purposes include a requirement for a bat friendly entrance. In Veternica cave there are visiting restrictions due to the hibernation colony of several species. The cave is closed for visitors in winter period (from November until April).

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

State Institute for Nature Protection:

- Pavlinić I., Čivić K., Topić R., (2006): “Inventory and monitoring of cave dwelling bats”. Final report. SINP and CNHM. Funded by SINP (state budget) and EPEEF in 2006;

Croatian National History Museum:

- Pavlinić I., Holcer D., Čivić K. (2006): “*Plecotus kolombatovici* ecology and distribution”. Final report for 2006. CNHM and SINP. Funded by SINP (state budget);
- Pavlinić I., Đaković M., Čivić K. (2007): “Monitoring of bat nurseries in caves in 2007”. Final report. CNHM and SINP. Funded by SINP (state budget);
- Pavlinić I., Đaković M., Čivić K. (2007): “*Plecotus kolombatovici* distribution in south Dalmatian islands”. Final report. CNHM and SINP. Funded by SINP (state budget);
- “Croatian endangered and endemic species biology”. Scientific project funded by the Croatian Ministry of Science, Education and Sport. 2007 – ;
- Pavlinić I. and Đaković M. (2008): “NATURA 2000 in Croatia for bats - analysis”. Final Report. CNHM. Funded by SINP (state budget);
- Tvrtković N., Pavlinić I. (2007): “Sites with bat species from the Annex II of the Habitats Directive in Croatia from 1956 to 2006”. Funded by SINP (state budget);
- Pavlinić I. and Đaković M. (2009): “Scientific analysis of 12 bat species from the Annex II of the Habitats Directive for the preparation of NATURA 2000 sites for bats proposal”. Final report CNHM. Funded by SINP (state budget);
- Pavlinić I. (2008): “Bat research in Veternica cave to determine the species that use it as an occasional roost”. 2007 – 2008. Own funding;

Centre for Research and Protection of Nature - Fokus

- Pavlinić I. and Đaković M. (2009): “Development of bat monitoring methodology for the purpose of reporting pursuant to the Article 17 of the Habitats Directive and monitoring of *Rhinolophus ferrumequinum* i *R. blasii*”. Final report. Funded by SINP (state budget);
- Pavlinić I. and Đaković M. (2009): “Inventory of bats (Chiroptera) of the lower course of the Una River”. Final report. Funded by SINP;
- Pavlinić I. and Đaković M. (2009): “Monitoring and abundance analysis of the bat population in Trbušnjak cave near Pakrac with conservation measures”. Final report. Funded by SINP (state budget);

Croatian Biospeleological Society:

- “Biospeleological research of the Krka National Park”. Funded by the Public Institution Krka National Park in 2005. Report in 2006;
- Hamidović D.: “Conservation of the Long-fingered Bat, *Myotis capaccinii*, for protection of karstic habitat in Croatia”. Funded by Whitley Fund for Nature (UK), EPEEF, SINP and MC. 2007 – 2009. Reports in 2008 and 2009;
- Hamidović D., Žvorc P. (2006): “Bat ecology research in the Veternica Cave with the long-term monitoring proposal”. Funded by Public Institution Nature Park Medvednica. 2003-2005. Report in 2006;
- Žvorc P., Hamidović D.: “Bat monitoring in the Veternica Cave”. Funded by Public Institution Nature Park Medvednica. 2007 – . Reports in 2008, 2009 and 2010;
- Žvorc P. and Hamidović D. (2008): “Bat inventory in the Vransko Lake Nature Park”. Final report. Funded by Public Institution Nature Park Vransko Lake in 2007;
- Žvorc P.: “Migratory colonies of cave dwelling bat species monitoring in the Vransko Lake Nature Park”. Funded by Public Institution Nature Park Vransko Lake in 2008. Report 2009;
- Bedek J., Hamidović D., Lukić M., Ozimec R., Bilandžija H., Slapnik R., Pavlek M., Dražina T., Iepure S., Žvorc P., Gottstein S “Research on subterranean fauna and bats in the Dobra River Canyon” in regards to the Bern convention “Recommendation No.129 (2007) on the construction of a dam and hydroelectric power station in Lešće on the Dobra River”. Funded by Hrvatska Elektroprivreda d.o.o. (Croatian Electricity Ltd) in 2008 – 2009. Report 2009;
- Bedek J. (project leader): “Biodiversity of subterranean fauna of Karlovac County”. Funded by the European Union through PHARE 2006 Program. 2008 – 2009;
- Ozimec R. (project leader): “Ombla-Paleombla”. Funded by CBSS and SINP (state budget). 2008-2009. Report in 2009;
- Ozimec R. (project leader). “Expedition Pišurka”. Funded by CBSS and the town of Korčula. 2010;
- Ozimec R. (project leader): “Monitoring of speleological objects in Biokovo Nature Park”. Funded by Public Institution Biokovo Nature Park. 2010 – ;

Biology Students Association BIUS, Bat Group, supervisor: Hamidović D., CBSS

- „Inventarisation of flora and fauna of Lika river“. In cooperation with Green Action NGO. October 2006 – April 2007. Report in 2007;
- Interdisciplinary biological research camp "Lastovo 2007" in Nature Park Lastovsko otočje (inventarisation of bat fauna). February 2007 – February 2008. Report 2008. Research camp almanac 2008;
- „Biological inventarization of rivers Glina, Ričica and upper Una in Lika-Senj County“. Within the Green Action project „Promoting conservation of border river ecosystems and sustainable use of resources in border area of Croatia and Bosnia and Herzegovina“. November 2007 – November 2008. Report 2008;
- Biological research camp "Paklenica 2008" in National Park Paklenica. April 2008 – October 2009 (bat fauna research in spring and autumn migration period in 2008 and bat fauna research with special emphasis on altitude distribution in 2009). Report 2009;
- Biological research camp „Kornati 2009“ in National Park Kornati (inventarisation of bat fauna) in cooperation with „Argonauta“ NGO. January 2009 – October 2009. Report 2010;
- „Bat fauna of park Maksimir, Zagreb“. April 2009 – . Preliminary report 2009;

- „Contribution to biodiversity protection in Croats Kornati Archipelago – Mobilizing NGO's in protected areas” (monitoring of bat fauna in National Park Kornati). Project bearer “Argonauta” NGO. January 2009 – ;
- International biological research camp “Biodiversity research of river Zrmanja 2010” (inventarisation of bat fauna). April 2010 – ;

Association for Bat Conservation Tragus:

- Mazija M., Štefan A., Domazetović Z. (2010): “Bat fauna research in the National Park Mljet”. Final report. May 2008 – May 2009. Funded by Public Institution National Park Mljet;
- “Forest bat species in Nature Park Medvednica”. Funded by Public Institution Nature Park Medvednica, May 2010 - ;

Individual reports:

Pavlinić I., M. Đaković (2008): “Distribution of bats in the ecological network areas along the Sava River, with the emphasis on *Myotis dasycneme*”. Funded by SINP (Project LIFE Sava);

Pavlinić I., M. Đaković (2008): “Maternity roosts in churches in the Jelas polje area along the Sava River, with the emphasis on *Myotis dasycneme*”. Funded by SINP (Project LIFE Sava);

Hamidović D. (2007): “Report on bat research in the Bijela River Canyon – River Bijela Spring Cave”. Funded by SINP (state budget);

Hamidović D., Presetnik P. (2007): “Report on *Myotis emarginatus* maternity roost in the St. Peter Chappel, Gradec, Lekenik”. Report for the Ministry of Culture. Funded by P. Presetnik and D. Hamidović;

Other:

Fressel N. (2010): “Conservation and sustainable cave management for two endangered bat species summer colony in Croatia”. Poster presentation. Student Conference on Conservation Science 2010. University of Cambridge, UK. Book of Abstracts;

Fressel N., Kipson M., Kovač D., Josić D., Zrnčić V., Prohaska A., Drakulić S., Medvedović J. (2008): “BIUS – Croatian Biology Student Organization; Presenting the Bat section”. Poster presentation. XI EBRs, Cluj-Napoca, Romania. Book of Abstracts;

Hamidović D., Perović F., Šterk I., Zupan I. (2007): “Diet of the Longfingered Bat *Myotis capaccinii* nursery inhabiting Miljacka II Cave”. Poster presentation. XIVth International Bat Research Conference and 37th North American Symposium on Bat Research, Mexico. Book of Abstracts;

Hamidović D., Žvorc P. (2007): “Conservation of bats in the Veternica Cave, Croatia”. Poster presentation. XIV International Bat Research Conference and 37th North American Symposium on Bat Research, Mexico. Book of Abstracts;

Hamidović D., Zupan I., Jokić M., Alegro A., Bedek J., Cukrov N., Jalžić B., Ozimec R., Perović F., Popijač A., Štefan A., Žganec K. (2008): “The role of the Long-fingered bat, *Myotis capaccinii*, as an indicator species for Dinaric karst – bridging the gap between terrestrial and aquatic ecosystems”. Oral presentation. XI EBRs, Cluj-Napoca, Romania. Book of Abstracts;

Hamidović D., Žvorc P., Kipson M., Cvitanović H., Rnjak G., Bedek J., Ozimec R., Jalžić B., Rade P., Cukrov M., Zupan I., Fressel N., Jalžić V. (2008): “Croatian Biospeleological Society – cave dwelling bats research and conservation activities”. Oral presentation. XI EBRs, Cluj-Napoca, Romania. Book of Abstracts;

Kipson M., Medvedović J., Kovač D., Drakulić S., Fressel N., Zrnčić V., Josić D., Prohaska A., Jagarinec A., Jaković Ž. (2008): “Bat fauna at two Croatian islands distant from the coast: the island of Vis and the island of Lastovo”. Poster presentation. XI EBRs, Cluj-Napoca, Romania. Book of Abstracts;

Kovač D., Kipson M., Drakulić S., Fressel N., Zrnčić V., Josić D., Prohaska A., Grgurev M. (2008): “Bat fauna of Paklenica National Park: Searching for new swarming sites and migration

roosts". Poster presentation. 1st International Symposium on Bat Migration, Berlin, Germany. Book of Abstracts;

Mazija M. (2009 and 2010): "Report on the permit use for bat research and monitoring regarding EIA". OIKON Ltd. Institute for applied ecology.

Pavlinić I. (2008): "Ecology of alpine long-eared bat (*Plecotus macrobullaris* Kuzjakin, 1965) and Balkan long-eared bat (*P. kolombatovici* Đulić, 1980) (Mammalia, Chiroptera)". PhD thesis. University of Zagreb, Faculty of Science;

Pavlinić I., Tvrtković N., Holcer D. (2008): "Morphological identification of the soprano pipistrelle (*Pipistrellus pygmaeus* Leach, 1825) in Croatia". *Hystrix It. J. Mamm. (n.s.)* 19 (1): 47-53;

Pavlinić I., Čač Ž., Lojkić I., Đaković M., Bedeković T., Lojkić M. (2009): "Bats-biological reservoirs and potential lyssavirus carriers". *Veterinarska stanica: Scientific Veterinary Journal (0350-7149)* 40 (2009), 5; 297-304;

Spitzenberger F., Pavlinić I., Podnar M. (2008): "On the occurrence of *Myotis alcathoe* von Helversen and Heller, 2001 in Austria". *Hystrix It. J. Mamm. (n.s.)* 19 (1): 3-12;

Zrnčić V., Josić D., Drakulić S., Hamidović D., Bakić J. (2010): "An overview on bat zoonosis and ectoparasite research in Croatia". Poster presentation. 2nd International Berlin Bat Meeting: Bat Biology and Infectious Diseases, Berlin, Germany. Book of Abstracts;

Žvorc P., Hamidović D., Kipson M. (2008): "Bats of the Vrana Lake Nature Park". Poster presentation. XI EBRs, Cluj-Napoca, Romania. Book of Abstracts;

Žvorc P., Hamidović D., Kipson M. (2008): "Monitoring of bats in the Veternica Cave". Poster presentation. XI EBRs, Cluj-Napoca, Romania. Book of Abstracts;

Žvorc P., Hamidović D., Kipson M. (2009): "Cave dwelling bats in the Vrana Lake Nature Park". Poster presentation. 1st International Symposium on Bat Migration, Berlin, Germany. Book of Abstracts;

13. Consideration being given to the potential effects of pesticides on bats, and their food sources and efforts to replace timber treatment chemicals which are highly toxic to bats

No surveys and actions have been undertaken in this field since the last report.

D. FUNCTIONING OF THE AGREEMENT

14. Co-operation with other Range States

Croatian bat experts have carried out joint projects and cooperated with colleagues from Czech Republic, Slovenia, Serbia, Turkey, United Kingdom, Switzerland and Austria.

CNHM cooperates with:

- Dr. Raphaël Arlettaz, University of Bern, Division of Conservation Biology, Institute of Zoology, Bern, Switzerland
- Dr. Friederike Spitzenberger, Natural History Museum, Mammal Department, Vienna, Austria

CBSS cooperates with:

- MSc Radek K. Lučan, Department of Zoology, Faculty of Science, Charles University in Prague, Czech Republic
- Mr. Primož Presetnik, Centre for Cartography of Fauna and Flora (CKFF), Ljubljana Office, Slovenia
- Dr. Ibrahim Raşit Bilgin, Boğaziçi University, Institute of Environmental Sciences, Istanbul, Turkey
- Dr. Henry Schofield, Vincent Wildlife Trust, United Kingdom.

BIUS cooperates with:

- Mr. Emrah Çoraman, Boğaziçi University, Institute of Environmental Sciences, Istanbul, Turkey
- Dr. Ibrahim Raşit Bilgin, Boğaziçi University, Institute of Environmental Sciences, Istanbul, Turkey

- Dr. Pavel Hulva, Charles University Prague, Faculty of Science, Department of Zoology, Prague, Czech Republic
- MSc Radek K. Lučan, Charles University Prague, Faculty of Science, Department of Zoology, Prague, Czech Republic
- Mr. Primož Presetnik, Centre for Cartography of Fauna and Flora, Ljubljana Office, Ljubljana, Slovenia

BIUS members visited Czech Republic in 2008 and 2009 for educational purposes and attended field work organized by bat scientists Radek K. Lučan and Michal Andreas.

Tragus cooperates with Mr Branko Karapandža, Wildlife Conservation Society “Mustela”, Serbia.

D. Hamidović is a member of the IUCN Bat Specialist Group (<http://www.batconservancy.org/75.php>).

N. Fressel attended the Student Conference on Conservation Science 2010 at the University of Cambridge and the internship programme with the Vincent Wildlife Trust with mentorship from dr. Henry Schofield in spring 2010.

15. Measures taken to implement Resolutions adopted by Meeting of Parties

Resolution 2.2: Consistent Monitoring Methodologies followed by Resolution 5.4: Monitoring Bats across Europe

Croatian bat experts participated in the IWG “Producing Guidelines on Bat Monitoring Methods to Assess Population Trends at Different Levels” and “Pan-European Monitoring Project for Underground Sites (PEMBUS)”. Croatia was included in the feasibility study of PEMBUS project to develop Pan European Monitoring of Bats in Underground sites (April 2008, London).

Standardized monitoring system of Croatian bat populations is still lacking. The population trend of selected species cannot be specified in statistically significant way yet. However there are several sites (caves mostly) that are being regularly monitored for the past 10 years.

In 2008 SINP published the *Manuals for inventarisation and monitoring the status of species and habitats in Croatia; Chapter: Bats*, covering *Rhinolophus ferrumequinum*, *R. hipposideros*, *Pipistrellus pipistrellus*, *Pipistrellus pygmaeus*, *Nyctalus leisleri*, *N. noctula* and *Plecotus* species. The Manual has a description of the data collecting methodology, protocols and field forms for basic monitoring of species or groups of species which are easily recognised or identified by bat detector, so data can be gathered using non-invasive techniques.

Currently, the development of monitoring methodology for the purpose of reporting to the European Commission according to Article 17 of Habitat Directive is in progress.

MC - Nature Protection Directorate distributed EUROBATS publication “Guidelines for Surveillance and Monitoring of European Bats” to bat experts and NGOs, public institutions governing protected areas and county public institutions governing protected natural values on regional level.

In regards to data storage and analysis mechanisms, in the scope of the IPA project “Development of faunistic and speleological databases (CRO fauna and CRO speleo)”, faunistic database “CRO fauna” and speleological database “CRO speleo” will be developed, so all relevant data on bats should be entered and stored in this database from 2012 and further.

Resolution 2.3: Transboundary Programme: Species proposals

There are currently no transboundary co-operation projects in Croatia to identify the distribution and migration patterns of *Myotis dasycneme* and *Pipistrellus nathusii*.

Resolution 2.4: Transboundary Programme: Habitat proposals

In regards to bats in underground sites and forests, research and monitoring are ongoing. The list of important underground sites for bats is increasing from year to year because of growing number of bat researchers and ongoing bat research done by several

organisations, especially in the scope of defining future Natura 2000 proposal. Forest dwelling bat species are not so thoroughly researched and data on these species is scarce or lacking.

Defining the Natura 2000 sites important for bats according to the criteria of the Annex III of the Habitat Directive is in progress. For bat species not listed on the Annex II of the Habitats Directive clear criteria for defining the important sites on the national level are not yet established.

Underground sites important for bats in Croatia were identified and included in EUROBATS Publication series 2 "Protecting and managing underground sites for bats". In April 2010 SINP and MC-NPD submitted a revised list of important underground sites, derived from the current data gathered for the NATURA 2000 proposal. This is still a draft list of important underground sites, since the data and criteria for selection of sites need to be revised and unified.

Assessment of conservation problems and protection measures for bats in forests and underground habitats on national level hasn't been made.

Resolutions 1-J, 2.7 and 3.3: Format of National (Implementation) Reports

This report has been prepared in accordance with the adopted format.

Resolutions 1-K, 2.8, 3.8, 4.9, 5.10: Implementation of the Conservation and Management Plan

All relevant activities are elaborated in points 1 to 14 of this report.

Resolution 3.4: Guidelines for the Issue of Permits for Bat Ringing Activities; incorporated in Resolution 4.6: Guidelines for the Issue of Permits for the Capture and Study of Captured Wild Bats and Resolution 5.5: Guidelines for the Issue of Permits for the Capture and Study of Captured Wild Bats

The Ministry of Culture as the responsible authority for nature protection in Croatia, issues permits for the capture and study of captured wild bats. According to the Article 67 of the Nature Protection Act (OG 70/05, 139/08), bat research and activities in speleological objects may be carried out only based on a permit from the Ministry, which sets out the nature protection requirements (permitted actions, techniques, equipment, etc.). Permit is issued for a fixed term. A legal entity or natural person who carried out the research must report the results of the research to the Ministry and the State Institute for Nature Protection within thirty days from the date of research completion. Infringement of a permit or carrying out of bat research and activities in speleological objects without a permit is subject to misdemeanour provisions of the Nature Protection Act.

Bat ringing hasn't been licensed since Croatia became a party to EUROBATS in 2000.

Resolution 3.7: Amendment to the Agreement

Croatia hasn't deposited an instrument of acceptance to the Amendment yet.

Resolution 5.1: Financial and Administrative Matters (Budget 2007 – 2010)

Croatia has paid all annual contributions to EUROBATS in the reporting period as requested by the Resolution.

Resolution 4.3: Guidelines for the Protection and Management of Important Underground Habitats for Bats

Underground sites important for bats in Croatia were identified and included in EUROBATS Publication series 2 "Protecting and managing underground sites for bats". In April 2010 SINP and MC-NPD submitted a revised list of important underground sites, derived from the current data gathered for the NATURA 2000 proposal. This is still a draft list since the data and criteria for selection of sites need to be revised and unified. Projects on cave dwelling bats and underground sites important for bats are listed in point 12.

All 35 bat species recorded in Croatia and all cave fauna are strictly protected. According to the Nature Protection Act (OG 70/05, 139/08), prior to performing any activity in a speleological object (organised visits or other use, reconstruction, scientific and technical research, recording films, taking photographs or other activities affecting fundamental features,

conditions and natural flora and fauna), it is necessary to obtain a permit from the Ministry. All speleological objects also represent an integral part of the national Ecological Network.

For caves open for tourism a bat friendly entrance is being proscribed. Veternica cave is closed for visitors in winter period (from November until April) due to hibernation of several bat species.

The MC - Nature Protection Directorate distributed EUROBATS publications „Protecting and managing underground sites for bats“ to bat experts and NGOs, public institutions governing protected areas and county public institutions governing protected natural values on regional level.

Resolution 4.4: Bat Conservation and Sustainable Forest Management

Forest dwelling bat species are not thoroughly researched and data on these species is scarce or lacking. Bat assembly in different forest habitat types has yet to be evaluated. For species listed on the Annex II of the Habitats Directive, defining Natura 2000 sites is in progress.

In regards to forest management practices and conservation of biological diversity, Nature Protection Act proscribes it is necessary to safeguard a constant share of mature, old and dead trees, particularly hollow trees, pursuant to nature protection requirements which constitute an integral part of forest management plans and are proscribed by the MC - Nature Protection Directorate. At final cut of major forest surfaces, minor surfaces defined in forest management plans shall be left uncleared. In order to enrich biological and landscape diversity, forest management shall be implemented in such a manner as to preserve forest clearings (meadows, pastures, etc.) and forest edges to the maximum extent. However, greater efforts need to be put into further practical implementation of the legislative provisions.

According to the Forestry Act, national forest and woodland management company »Hrvatske šume« and forest owners are obliged to manage forests by preserving and improving the biological and landscape diversity and taking care of protecting the forest ecosystem (taking care of other species in the ecosystem which are tied to dry or rotting trees i.e. leaving a required number of old oaks, hollow and rotten trees in such a pattern and number as to preserve the biological diversity)

So far, forest management plans didn't include specific conservation measures for bats.

In 2006 the project "Inventarisation of forest bat fauna in Nature Park Medvednica" was conducted by the CNHM, in the scope of the project "Forest management in harmony with nature" financed by the Royal Netherlands Embassy in Croatia as a part of "Matra Kap Programme". In 2007 Public Institution Nature Park Medvednica published a booklet and presented project results to forestry sector with the purpose of their implementation in the forestry management program.

Resolution 4.5: Guide for the Use of Remedial Timber Treatment

No specific measures or actions undertaken.

Resolution 4.7 and 5.6: Wind Turbines and Bat Populations

The obligation to conduct the Environmental Impact Assessment (EIA) study for the installation of wind turbines is proscribed by law in Croatia. The EIA procedure is under the jurisdiction of the national or local government, depending on the size of the project.

Potential wind farm sites are identified in the Physical Plan. So far, the choice of potential locations for wind farms in Croatia has mainly been based on wind potential of specific locations, and no account has been taken of cumulative effects of installation of a substantial number of wind farms in a certain area.

Previously, in the EIAs for the installation of wind turbines only the impact on birds was studied, but in the newer EIAs the assessment of the impact on bats is also required.

The wind energy investors are obliged to finance the EIA study in order to obtain the relevant permits and to finance monitoring after installation. In the EIA procedure the measures are proscribed to avoid the negative impacts of wind turbines on bats. These measures include the obligation of monitoring.

For the projects planned on the area of the Ecological Network of Republic of Croatia the Nature Impact Assessment needs to be carried through and take into account cumulative effects of installation. For all wind farm projects the Environmental Impact Assessment is obligatory and needs to assess the impact on bats and give the mitigation measures to avoid the negative impact.

The MC, Nature Protection Directorate distributed in 2008 EUROBATS publication "Guidelines for consideration of bats in wind farm projects" to agencies, companies and bat experts involved in the planning and EIA of wind farms and officially recommended the use of these Guidelines until the national guidelines are developed.

In 2009 national guidelines were prepared by the MC, Nature Protection Directorate, based on the EUROBATS guidelines and in consultation with bat experts working on wind turbines impact assessment.

In December 2009 guidelines were sent to the Ministry of Environmental Protection, Physical Planning and Construction (MEPPPC) to be distributed to all the companies authorised for EIA for wind farm projects. The Ministry of Culture also requested these guidelines to be included in the general guidelines for EIA for wind turbines developed by the MEPPPC.

In the guidelines it is specified that the measures proposed in the EIA for the avoidance of negative impact on bats during the operation of the wind turbines should include the adaptation of time of operation or stopping of wind turbines in the peaks of bat activity (identified by the EIA and monitoring).

Current activities on UNDP project COAST include support to SINP in the introduction of Nature Impact Assessment practices in coastal areas. That includes development of Manual and guidelines appropriate for different kinds of NIA. The Manual will be applied to a specific location of wind power plant. This will include analysis of biological data of the respective location with special valorisation of the area regarding bats (and birds), bat monitoring, assessment of the acceptability of planned location and detection of possible influence on the Ecological Network (planned NATURA 2000).

Resolution 5.2: Bats and Rabies in Europe

No specific measures undertaken.

At the Second Symposium on Rabies in Croatia with International Participation held in December 2006 in Zagreb, Croatia, it was concluded that during last 42 years no human rabies incident was recorded. It is compulsory to conduct antirabid treatment on a person bitten by bat suspicious of rabies.

Occasionally, bat corpses and museum specimens were analyzed for rabies at the Croatian Veterinary Institute and proved to be negative (Pavlinić I., Čač Ž., Lojkić I., Đaković M., Bedeković T., Lojkić M. (2009): Bats-biological reservoirs and potential lyssavirus carriers, Veterinarska stanica: Scientific Veterinary Journal (0350-7149) 40 (2009), 5; 297-304.)

Resolution 5.7: Guidelines for The Protection of Overground Roosts, with particular reference to roosts in buildings of cultural heritage importance

The current data on overground roosts important for bats is stored in SINP database.

The MC, Nature Protection Directorate distributed EUROBATS publication "Protection of overground roosts for bats" in 2010 to bat experts and NGOs, cultural heritage conservation departments, public institutions governing protected areas and county public institutions governing protected natural values on regional level, with a request to provide data on bat roosts in cultural heritage buildings.

But so far, cooperation between the cultural heritage conservation departments or managers and nature protection sector in regards to bat roosts in cultural heritage buildings has been sporadic. In a few cases restoration works have been conducted in cooperation and under supervision of bat experts. Conservation measures for bats, to be undertaken during restoration of cultural heritage buildings, were given by bat experts in a few cases. National guidelines for the protection of bat roosts in historical buildings do not exist.