

**AGREEMENT ON THE CONSERVATION OF BATS IN EUROPE
(EUROBATS)**

Fourth Report to the National Implementation of the Agreement

Croatia

2004 - 2006

**Croatian Natural History Museum
April 2005**

A. General information

Party: Hrvatska (Croatia)

Period Covered by Report: April 2004 – April 2006

Competent Authority: The Ministry of Culture, Department of Nature Conservation (MC,DNC)

Competent expert group: Croatian Natural History (CNMH) Museum Bat Group (D. Hamidovic, D. Holcer, I. Pavlinic and N. Tvrtkovic)

Appointed members of the Advisory Committee: Mr Nikola Tvrtkovic, PhD, Croatian Natural History Museum, Demetrova 1, 10000 Zagreb, Hrvatska (as bat expert); Mrs Andreja Štefan, Ministry of Culture, Department of Nature Conservation

B. Status of Bats within the Territory of the Party

1. Summary Details of Resident Species

Table 1. List of Croatian bats

* = scarce field data; Status: *Rare, Common, Very common*

No.	Species	Resident	Evidence of Breeding	Evid. of Wintering	Supposed status
1.	<i>Rhinolophus blasii</i>	Yes	Yes Rare	Yes Rare	Rare
2.	<i>Rhinolophus euryale</i>	Yes	Yes Common	Yes Rare	Common
3.	<i>Rhinolophus ferrumequinum</i>	Yes	Yes Very common	Yes Common	Very common
4.	<i>Rhinolophus hipposideros</i>	Yes	Yes Common	Yes Rare	Very common
5.	<i>Rhinolophus mehelyi</i>	Vagrant ?	No	No	Probably extinct
6.	<i>Barbastella barbastellus</i>	Yes	Yes Rare	Yes Rare	Common
7.	<i>Eptesicus serotinus</i>	Yes	No*	No*	Common
8.	<i>Eptesicus nilssonii</i>	Hibernation	No*	No*	Rare
9.	<i>Hypsugo savii</i>	Yes	Yes Common	Yes Rare	Very common
10.	<i>Miniopterus schreibersii</i>	Yes	Yes Common	Yes Common	Common

No.	Species	Resident	Evidence of Breeding	Evid. of Wintering	Supposed status
11.	<i>Myotis alcaethoe</i>	Yes	No*	No*	Rare
12.	<i>Myotis aurascens</i>	Yes	Yes Common	Yes Rare	Common
13.	<i>Myotis bechsteinii</i>	Yes	Yes Rare	Yes Rare	Common
14.	<i>Myotis (blythii ?) oxygnathus</i>	Yes	Yes Very common	Yes Rare	Very common
15.	<i>Myotis brandtii</i>	Yes	Yes Common	Yes Rare	Common
16.	<i>Myotis capaccinii</i>	Yes	Yes Common	Yes Rare	Common
17.	<i>Myotis dasycneme</i>	Hibernation	No*	Yes Rare	Rare
18.	<i>Myotis daubentonii</i>	Yes	No*	Yes Rare	Very common
19.	<i>Myotis emarginatus</i>	Yes	Yes Very common	Yes Rare	Very common
20.	<i>Myotis myotis</i>	Yes	Yes Common	Yes Rare	Common
21.	<i>Myotis mystacinus</i>	Yes	Yes Common	Yes Rare	Common
22.	<i>Myotis naterreri</i>	Yes	Yes Rare	Yes Rare	Rare
23.	<i>Nyctalus lasiopterus</i>	Migration ?	No*	Yes? Rare	Rare
24.	<i>Nyctalus leisleri</i>	Yes	No	Yes Rare	Common
25.	<i>Nyctalus noctula</i>	Yes	No	Yes Common	Very common
26.	<i>Plecotus austriacus</i>	Yes	Yes Rare	Yes Rare	Rare
27.	<i>Plecotus auritus</i>	Yes	Yes Common	Yes Rare	Very common
28.	<i>Plecotus kolombatovici</i>	Yes	Yes Common	No*	Common
29.	<i>Plecotus macrobullaris</i>	Yes	Yes Common	Yes Rare	Common
30.	<i>Pipistrellus kuhlii</i>	Yes	Yes Common	Yes Rare	Very common
31.	<i>Pipistrellus nathusii</i>	Hibernation	No	Yes Rare	Common
32.	<i>Pipistrellus pipistrellus</i>	Yes	No*	No*	Common
33.	<i>Pipistrellus pygmaeus</i>	Yes	Yes Very common	Yes Rare	Very common
34.	<i>Tadarida taeniotis</i>	Yes	Yes Common	Yes (but active)	Common
35.	<i>Vespertilio murinus</i>	Hibernation	No*	No*	Rare

35 bat species in total have been recorded in Croatia: 29 resident, 4 only came for hibernation, 1 probably in migration, 1 probably vagrant in the past. For 23 species at all breeding was confirmed, and by 28 at all wintering registered. In Annex 2. of Habitats Directive are 13 species.

Only *Rhinolophus mehelyi* has not been confirmed in the recent studies, and new data of *Nyctalus lasiopterus* need confirmation. On the basis of molecular method and morphology we registered two specimens of *Myotis alcaethoe* (male collected and female released) from field survey in 2003.

2. Status and Trends

Provisionally status and trends of species are registered on the basis of historical data (wintering and maternity colony counts) from Professor B. Djulić's notes before 50 years and new data from the same localities since 2002. For status and trends must start monitoring in relevant number of samples (sites). In autumn 2005. State Institute for Nature Conservation start with one kind of monitoring (permanent data loggers for temperature and humidity, monthly counts of bat species) in four sites (Vištica pothole, Tradanj cave, Matešića cave, Kuštrovka cave).

Table 2. List of threatened bat species with some species from Annex 2. Habitats Directive in Croatia with provisional status and trends.

No.	Species	Supposed population trend	Number of known maternity roosts	Supposed number of breeding specimens	IUCN Category	Regional Category	Percent of whole species population
1.	<i>R. blasii</i>	decline	1	1.500	NT	VU A1a;E	small
2.	<i>R. euryale</i>	decline	8	10.000	VU	VU B2b(iv)	?
3.	<i>R. ferrumequinum</i>	stabile ?	30	35.000	NT	NT	?
4.	<i>R. hipposideros</i>	stabile ?	8	?	VU	NT	small
5.	<i>B. barbastellus</i>	unknown	0	?	VU	DD	small
6.	<i>M. schreibersii</i>	decline	12	13.000	NT	EN A1ac	small
7.	<i>M. bechsteini</i>	unknown	1	?	VU	VU A2c;B2b(iii)	small
8.	<i>M. capaccinii</i>	decline	8	15.000	VU	EN B2ab(iii)	significant
9.	<i>M. dasycneme</i>	unknown	0	?	VU	DD	small
10.	<i>M. emarginatus</i>	unknown	14	48.000	VU	NT	significant
11.	<i>M. myotis</i>	decline ?	3	9.000	NT	NT	small
12.	<i>N. leisleri</i>	unknown	0	?	NT	DD	small
13.	<i>P. austriacus</i>	decline	1	?	LR	EN A1e	small
14.	<i>P. kolombatovici</i>	decline ?	3	1.500	NE	DD	?
15.	<i>P. macrobullaris</i>	decline ?	5	?	NE	DD	?
16.	<i>M. blythii oxygnathus</i>	unknown	15	60.000	LR	LR	?

3. Habitats and Roost Sites

Locations (coordinates) of sites were deposited in database of T. Mitchell-Jones, but only for usage as points in mapping projects, without permit for using exact coordinates for other purposes. Added are, also, Croatian biogeographical regions after Emerald Network project (**Alpine**, **Continental**, **Pannonian**, **Mediterranean**).

Table 3. List of the most important natural multi-species roost sites in Croatia with more than 200 specimens/site in nursing or/and hibernation roosts. It is a selection from 77 known underground sites with bats. Methodology and categories after EUROBATS Habitats group, but proposed column *location* are changed with column *region* (biogeographical region).

No	Site name	Region	Site Type	Usage	Max count	Species recorded; Target species
1.	Spilja Kustrovka	Alp	Cave	Hibernation	30.250	4; MS
2.	Visticina jama	Med	Pit	All year RF Hibern. MS	20.150	5; MS, RF, MC
3.	Spilja Tradanj	Med	Cave	Maternity	20.000	5; ME, RF, RE, MO
4.	Jamina	Med	Pit	Hibernation	6.000	1; MS
5.	Culumova pecina	Med	Cave	All year	6.000	6; MS, MC, RF, MM
6.	Spilja Miljacka II	Med	Cave	All year	6.000	8; MC, MS
7.	Medova buza	Med	Sea-cave	Maternity	4.270	5; MS, ME, RE, MO
8.	Markova jama	Med	Pit	Maternity	3.000	4; MS, MM, RF, MO
9.	Spilja Golubinka	Med	Cave	Maternity	3.000	2; ME, RF
10.	Skarin Samograd	Med	Cave	All year	1.590	5; MS, RF, MO
11.	Zagorska pec	Med	Cave	All year	1.300	5; RF, MO, MS
12.	Draskova spilja	Med	Sea-cave	Maternity	1.200	2; ME, RF
13.	Matesica pecina	Con	Cave	All year	1.177	5; MC, MS, RE

No	Site name	Region	Site Type	Usage	Max count	Species recorded; Target species
14.	Jama Suhi Rumin	Med	Pit	All year	1.000	4; ME, RF
15.	Vilina pec	Med	Cave	Maternity	910	5; MS, ME, RE, MO
16.	Spilja Tounjcica	Alp	Cave-spring	Maternity	700	3; MS
17.	Spilja Veternica	Con	Cave	All year	500	13; MS, RF, RE
18.	Jopiceva jama	Con	Cave	All year?	404	3; RF
19.	Medvidja ropa	Med	Sea-cave	Maternity	400	3; ME, RF
20.	Rogovac spilja	Con	Cave	Maternity ?	400	1; RE
21.	Uviraljka	Pan	Swallow hole	Hibernation	> 370	11; MD, MDas, RF
22.	Boltekova spilja	Med	Cave	Maternity	300	1; ME
23.	Spilja Bela voda	Med	Cave-spring	Maternity	300	1; MO
24.	Modra pecina	Alp	Lake-cave	Maternity	250	5; MS, MC, MO
25.	Bariceva cave	Alp	Spring-cave	Maternity	234	9; RE, MS
25.	Spilja near Krupa	Med	Cave	Maternity	200	2; MO, MS
26.	Spilja na rtu Kabel	Med	Sea-cave	Maternity ?	200	2; RF, ME

MS= *Miniopterus*; ME= *M. emarginatus*; MO=*M. oxygnathus*; MM=*M. myotis*; MC=*M. capaccinii*; MD=*M. daubentoni*; MDas=*M. dasycneme*; RF=*R. ferrumequinum*; RE= *R. euryale*

Table 4. Roost sites in attics and other artificial shelters with more of 150 bats.

No.	Site name	Region	Site type	Usage	Max count	Species recorded
1.	Šibenik	Med	Old factory	Maternity	5.000	2; ME, RF
2.	Metković	Med	Building	Maternity	4.000	1; ME
3.	Boljun	Med	Church loft	Maternity	400	2; PM, PK, RH
4.	Rudnik Vora	Med	Mine	Hibernation	400	1; RF
5.	Donji Miholjac	Pan	Building	Maternity	300	1; PP
6.	Zagreb	Con	Hospital	Hibernation	300	1; NN
7.	Sisak	Con	Factory	Maternity	300	1; NN
8.	Karlovac	Con	Building	All year	250	1; NN
9.	Ozalj	Con	Old castle	Maternity	250	1; RF
10.	Donji Miholjac	Ung	Building	Maternity	200	2; PP, PN
11.	Novigrad	Med	Old house	Maternity	200	2; MO
12.	Metkovic	Med	Building	Hibernation?	170	1; PK

NN=*N. noctula*; PK=*P. kuhlii*; PP=*P. pygmaeus*; PM=*P. macrobullaris*; PK=*P. kolombatovici*

Only some new but scarce data of forest foraging habitats of *M. bechsteinii*, *B. barbastellus*, *P. macrobullaris*, *P. kolomatovici*, *Nyctalus leisleri* and *M. brandtii* are known.

4. Threats

The same as in the last report.

5. Data collection

The same as in the last report.

C. Measures Taken to Implementation Article II of the Agreement

6. Legal measurements taken to protect bats

All bats species are legally protected by law, same as all cave fauna which include bat colonies in caves, but in practice this protection is hardly ever materialized. Special measurements do not exist.

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

Table 5. List of identified threatened multi-species sites which are in need of urgent special protection and conservation measures (SSSI).

<i>No.</i>	<i>Site name</i>	<i>Target species</i>	<i>Threats</i>
1.	Tradanj cave Maternity, 20.000 bats, 5 species	<i>R. euryale</i> <i>M. emarginatus</i> <i>R. ferrumequinum</i>	Archeological site; Disturbance
	Miljacka II cave All year, > 5.000 bats, 8 species Part of National Park Krka	<i>M. capaccinii</i>	Disturbance
2.	Čulumova cave All year, 6.000 bats, 6 species	<i>M. myotis</i> <i>R. ferrumequinum</i> <i>M. capaccinii</i>	Touristic plans
3.	Golubinka cave Maternity, 3.000 bats, 2 species	<i>M. emarginatus</i> <i>R. ferrumequinum</i>	Disturbance; Touristic area
4.	Medova buža sea-cave Maternity, 2.900 bats, 5 species	<i>M. schreibersii</i> <i>R. euryale</i> <i>M. emarginatus</i>	Disturbance; Touristic area
5.	Škarin Samograd cave All year, 1.590 bats, 5 species	<i>M. myotis</i> <i>M. schreibersii</i> <i>R. ferrumequinum</i>	Archeological site; Guano harvesting; Disturbance;
6.	Zagorska cave All year, 1.300 bats, 5 species	<i>R. ferrumequinum</i>	Touristic plans; Solid waste deposit
7.	Matešića cave All year, 1.177 bats, 5 species	<i>R. euryale</i> <i>M. capaccinii</i> <i>M. schreibersii</i>	Disturbance
8.	Vilina cave Maternity, 910 bats, 5 species	<i>R. euryale</i> <i>M. emarginatus</i> <i>M. schreibersii</i>	Plans for hydroelectric power station: Ministry signed permit for overflow of cave
9.	Veternica cave All year, >500 bats, 13 species Part of Nature Park Medvednica	<i>R. ferrumequinum</i> <i>M. schreibersii</i> <i>R. euryale</i>	Disturbance; Touristic area
10.	Uviraljka swallow hole Hibernation, > 270 bats, 11 species Part of Nature Park Papuk	<i>M. dasycneme</i> <i>M. daubentonii</i>	Cave is situated near military facilities; building of wider road and lost of water flow in cave
11.	Barićeva cave, Maternity, > 200 bats, 9 species	<i>R. euryale</i> <i>M. schreibersii</i>	Cave is situated ½ km near National Park Plitvice and disturbance of tourists without control was noted

The list of sites identified as SSSI contains most important known and threatened bat sites, mostly recorded during season 2000 / 2001. Report was sent to relevant Ministry, but no SSSIs have yet been protected with exceptions of Veternica cave and Uviraljka cave, both in Nature Parks (protection on local level only). We hope that the negotiations with European Union will help Croatia in implementation of the Agreement in near future.

8. Consideration given to habitats which are important to bats

There are only scarce information for bat important habitats (except for water-surface foragers and cave-dwellers shelters), but some general measurements only for forestry practice will be taken as part of new Nature Protection Law. Foraging key habitats are only registered for one maternity site of *Plecotus kolombatovici* and *P. macrobullaris*, and one maternity site of *Myotis bechsteinii*. No SSSIs have yet been protected.

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

- «Bat Night», held on 20/21st September 2004 in Nature Park «Papuk» in Velika village, and in Nature Park «Zumberak-Samoborsko gorje» in Slani Dol village, and one workshop for children in Samobor hosted and organized by Nature Park's staff and Museum bat group. In 2005 no «Bat Night» activities was registered.

- *Telephone* (CNHM number) with bat experts on line: 00385 1 4851 700

- *Radio*: several reportages;

- Booklet „Bats of Croatia with identification key“ because of shortage of money printing was stoped;

- Translated booklet „Bats in Forest“ was printed in 2005 (MCDNC) with support of EUROBATs Secretariat;

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

It has not been nominated.

11. Additional action undertaken to safeguard populations of bats

Not known

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

- *Scientific project* «The biology of indicator species of threatened habitats» (No. 183007) 2002-2004; Principal investigator: N. Tvrtković; team: D. Holcer, D. Hamidović, I. Pavlinić;

financed by Croatian Ministry of Science: started in September 2002; contain taxonomy and ecology of several bat species, include ringing, radio-telemetry of foraging habitats and food analysis of *Plecotus kolombatovici* and *P. macrobullaris*, started in 2004 (Igor Pavlinić, dissertation);

- *Conservation project* “Conservation of the longfingered bat *Myotis capaccinii* for the protection of karstic habitat”, 1999-2004. Project leader D.Hamidović, co-leader M. Jokic (Croatian Waters Company), funded by Whitley Laing Foundation (UK);
- *Conservation project* “Management of Veternica cave” with assessing influence of visitors on bat population too, 2003-2004, Croatian Biospeleological Society, financed by Nature Park Medvednica;
- *Inventory project*: „Bats in National Park Plitvice lakes“; 2002 - 2004 (N. Tvrtkovic, D. Kovacic, I. Pavlinic, D. Holcer); financed by National Park Plitvice Lakes;
- *Inventory project*: „Bats in Nature Park Zumberak and Samoborsko gorje“; 2002-2004 (I. Pavlinic); financed by Nature Park Zumberak and Samoborsko gorje;
- *Inventory project*: “Karst Ecosystem Conservation project, Croatia” (IBRD/GEF TF N° 050539 HR); 2003 – 2006, financed by WB/GEF and State Government. Include bat inventory in four National Parks and Velebit Nature Park (N.Tvrtković, I.Pavlinić, M.Vuković, I.Mihoci);
- *Inventory project*: Dinaric Alps rare habitats and species conservation project Croatia (PINMATRA /2003/024); 2003-2005; financed by Dutch ministries of Agriculture, Nature and Food quality and of Foreign Affairs. Include bat inventory in Velika Kapela Mt., Plješevica Mt., Dinara Mt, Biokovo Nature Park and Sniježnica Mt. (N.Tvrtković, I.Mihoci, I. Pavlinić);
- *Monitoring* of microclimatic conditions and monthly colony counts in four caves important for bats start in autumn 2005 (State Institute for Nature Protection);

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 official information or any kind of help have been provided from the State institutions considering our intention to fullfil EUROBATs questionnaire for parties which use pesticides and timber treatment chemicals, and for some other questionnaires too.

D. Functioning of the Agreement

14. Co-operation with other Range States

Only co-operation with Bern University in project on ecology of *Plecotus kololmbatovici* and *P. macrobullaris*, and with Vienna Natural History Museum on taxonomy and molecular genetic data on genus *Plecotus*.

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

In last years problem was changing of responsible State institution (from 2004 it is Ministry of Culture) and no money was planned for activities of EUROBATS implementation in 2005. We hope that the situation will change positively as soon as possible because without true cooperation between all involved sides real implementation of the agreement is almost impossible task.