14th Meeting of the Standing Committee
23rd Meeting of the Advisory Committee

Tallinn, Estonia, 14 – 17 May 2018

Draft Resolution 8.8
Bat Rescue and Rehabilitation

The Meeting of the Parties to the Agreement on the Conservation of Populations of European Bats (hereafter "the Agreement"),

Recalling Resolution No. 7.10: Bat Rescue and Rehabilitation (Brussels, September 2014) and all resolutions being referenced in it;

Further recalling that the 7th Session of the Meeting of the Parties to the Agreement requested the Advisory Committee to develop guidelines for bat rehabilitators and develop a system for collecting information for international cooperation;

Recalling the importance of bat rescue and rehabilitation for bat conservation, monitoring, raising public awareness of bat conservation, as well as for bat research and surveillance of bat zoonoses;

Decides that:

1. Parties should direct the Advisory Committee to finalize Guidelines for Bat Rescue and Rehabilitation, currently available as a draft Annex to this Resolution.

Annex

Guidelines:
Bat rescue and rehabilitation for bat conservation, research and monitoring

Prepared by members of the IWG on bat rescue and rehabilitation of the Advisory Committee to the EUROBATS Agreement

DRAFT

version
May 14, 2018

Contents

List of case studies

Introduction

During the interviewing the experts from party and non-party ranges of EUROBATS Agreement carried out by the members if the interessional working group on bat rescue and rehabilitation it was revealed that most of European countries deal with those issues.

In some countries there are many bat rehabilitation centres which had worked for many decades. In others, such centres appeared only recently or no centres exist but the bat rehabilitation is done by efforts of separate bat workers in bigger or smaller scales.

It was also revealed that bat rescue and rehabilitation may be considered a separate method for bat monitoring, research and conservation. These recoveries were adopted as the Resolution adopted by EUROBATS parties at the 7th Meeting of parties (see Annex 2). The resolution requested Advisory Committee of the Agreement to develop guidelines for people currently dealing with bat rescue and rehabilitation or those who will do it in future and to develop a system for collecting information for international cooperation.

After the additional work, the currents guidelines were prepared.

The main goal of the guidelines is to review basic of BRR, best practices and techniques for involving BRR for bat conservation, research and monitoring as well as to facilitate the connection and, therefore, the exchange of experience, of bat workers dealing with these issues.

For this,

1. We briefly review the situation with BRR across Europe (based on answers to the questionnaire and publications).

2. We provide a general review of basics for BRR, including:

basics of communication with applying people (finders)

norms and ethics of transportation, keeping and releasing individual bats and colonies.

3. We provide guidelines for involving BRR for bat research, conservation and public education, paying a special attention to bats engaged in education public events.

4. We also consider the health risks for bat rehabilitators

5. To facilitate a connection between experts and, generally, international cooperation, the list of bat workers dealing with BRR in different countries of EUROBATS range is given. The list of web-links to the corresponding sites or pages is given

6. For those, who are interested in details (veterinary etc) of bat rehabilitation itself, the list of references is provided

We also enlist / engage the case studies on all these issues from different range states.

1. Review of bat rescue and rehabilitation in Europe

The questionnaire was prepared and distributed through the EUROBATS Parties and Range States (Annex 1). The aim of the questionnaire was to collect the information and, correspondingly, to estimate the significance of bat rehabilitation throughout Europe, in view of bat conservation, public education and data collection. As well the respondents were asked to give references to manuals or guidelines available in national languages and to provide contacts of bat rehabilitation institutions and / or persons. Answers from 32 EUROBATS Parties and Range States were received: Albania, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Finland, France, Georgia, Hungary, Ireland, Italy, Latvia, Luxembourg, Macedonia, Moldova, Montenegro, the Netherlands, Poland, Portugal (Mainland + Madeira + Azores), Romania, Russian Federation, San Marino, Serbia, Slovakia, Slovenia, Switzerland, Ukraine, and the United Kingdom. Additionally, we analysed national reports of the EUROBATS Parties and Range States, scientific publications and made oral interviewing of bat-experts from the Agreement range.

Here, we resume the results of the interviewing.

1.1. Countries

Many European countries deal with bat rehabilitation (fig. *). Generally, the developement of bat rescue and rehabilitation centres differs from country to country. Some countries, according to answers, have many centres; some, one or few. In some countries the rehavilitation centres have the funding support from corresponding ministries, NGOs etc; in others, the rehabilitation is being done only with private resourses.

Fig. *. Countries dealing with bat rehabilitation, based on questionnaires and interviewing of countries' bat workers (grey, no rehabilitation; white, no information). As for May 2015; should be updated..

16 countries have bat rehabilitation databases, and 18 countries use finding data as the source for additional faunistic data (new localities, occurrence of species, sex ratio, etc). 20 countries use died animals for virological, morphological, parasitological, histological and other investigations and for replenishment of museum collections.

7 countries have their national manuals for bat rehabilitation.

1.2. Species

The majority of bats being rehabilitated represented mostly synanthropic species which are more or less common in different regions and typically dwell in buildings, forming there aggregations year around or during certain season.

The species, most commonly rescued and rehabilitated, are: Nyctalus noctula, Vespertilio murinus, Pipistrellus pipistrellus, Pipistrellus pygmaeus, Pipistrellus nathusii, Pipistrellus kuhlii, and Eptesicus serotinus.

However, the list of bats being rehabilitated include at least 11 more species: *Rhinolophus ferrumequinum*, *Myotis mystacinus/brandtii*, *M. daubentonii*, *Plecotus auritus*, *Plecotus austriacus*, *Barbastella barbastellus*, *Pipistrellus maderensis*, *Hypsugo savii*, *Nyctalus leisleri*, *Eptesicus nillsonii*, *Tadarida teniotis* (fig. *).

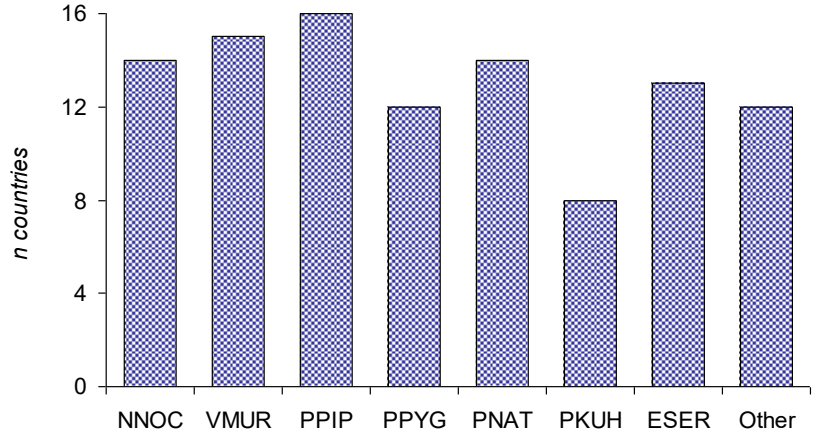

Fig. *. Bat species accepted for rehabilitation in 25 European countries.

Species acronyms:
NNOC – *N. noctula*, VMUR – *V. murinus*, PPIP – *P. pipistrellus*, PPYG – *P. pygmaeus*, PNAT – *P. nathusii*, PKUH – *P. kuhlii*, ESER – *E. serotinus.*

Category "Other" includes:
R. ferrumequinum, *M. mystacinus/brandtii*, *M. daubentonii*, *P. auritus*, *P. austriacus*, *B. barbastellus*, *P. maderensis*, *H. savii*, *N. leisleri*, *E. nillsonii*, *T. teniotis.*

1.3. Numbers

Number of bats received for bat rehabilitation per year differs from country to country. This number may, obviously, be determined by different factors (the severity of winters, availability of contacts of bat carers, the regularity of accidents of demolishing roosts, etc.). However, this number may reach considerable values (>3000 individuals per country / year).

The percentage of bats released successfully after rehabilitation differs throughout countries. It amounts from 50 to 70%.

To estimate the conservation significance of bat rescue and rehabilitation respondents were asked to give a rough number of rehabilitated bats by species (1–10, 10–100, 100–1000, >1000 ind. annually).

Available answers don't allow to give exact total numbers of bats being rehabilitated. However, the rough estimation (if to take 1–10 as 5 ind., 10–100 as 50, 100–1000 as 500, >1000 as 1000) gives the total sum in over 10 000 bat individuals through Europe per year (fig. *).

In reality, the number of bat individuals being rehabilitated through Europe may be even more: not all countries presented information, not all countries-respondents dealing with rehabilitation may provide numerical information etc.

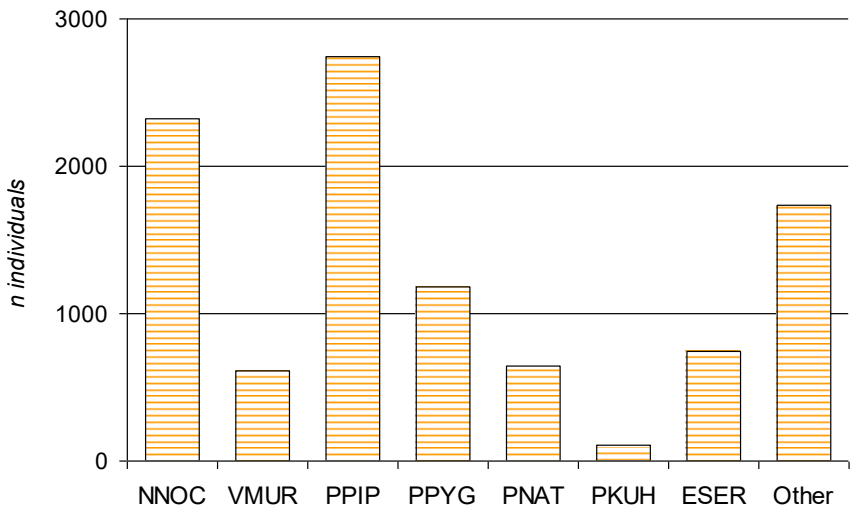

Fig. *. Rough estimation of number of bats being rescued and rehabilitated per year in 25 European countries.

Species acronyms:
NNOC – *N. noctula*, VMUR – *V. murinus*, PPIP – *P. pipistrellus*, PPYG – *P. pygmaeus*, PNAT – *P. nathusii*, PKUH – *P. kuhlii*, ESER – *E. serotinus.*

Category "Other" includes:
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Thus, the total number of bats being rescued and successfully released into the wild through Europe is more than 5 000 – 7 000 per year.

1.4. Situations

Fig. * summarises the information on bats being rescued and rehabilitated by situation categories. The category "invasions" includes cases when bats extracted from rooms require some additional help, like watering, shelter, etc. (they can't be released immediately). For example, there are known situations when bats occasionally invade rooms in winter, in periods of frosts. In such cases they can not be released and, correspondingly, need an (artificial) shelter for further hibernation.

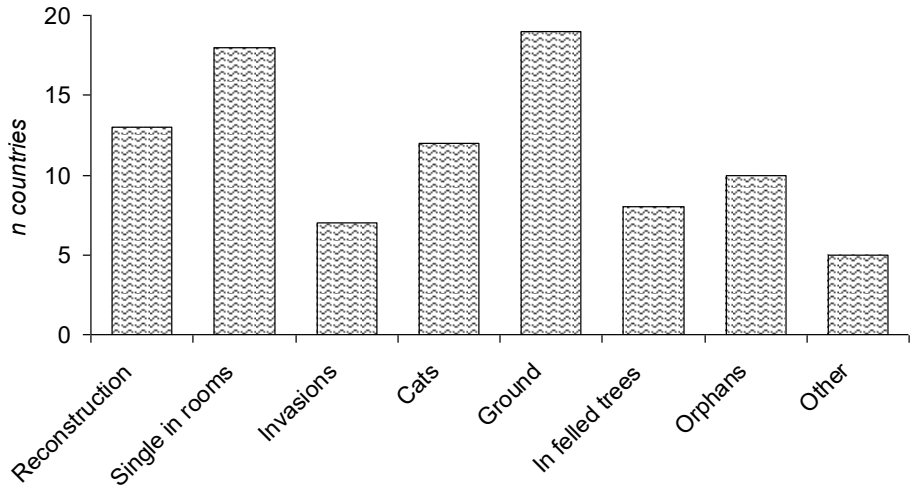


Fig. *. Which bats are being rescued and rehabilitated.

"Reconstruction" – extracted during construction works in buildings, "single in rooms" – single bats found in rooms, "invasions" – seasonal mass invasions into buildings, "cats" – caught by cats, "ground" – grounded adult specimens,

"in felled trees" – bats found in felled trees, "orphans" – orphaned juveniles. Category "Other" includes some other cases, like: bats were trapped in chimney, were hit with a car, were found in piles of firewood, etc.

1.5. Legislation

Only 10 countries have regulations for bat rehabilitation. *****

Case examples

Case study 1.*: Bat Rescue and Rehabilitation in UK

Case study 1.*: Bat Rescue and Rehabilitation in Byelarus

Minsk bat-contact Centre exists as an informal organization since 2007. The work of the Centre is mainly to provide information support to persons, who have applied upon detection of bats. If the animals could not be left in their original roost (finds on the street, on balconies and in living quarters, during construction works, etc.), bats were accepted by the Center for rehabilitation and artificial hibernation with subsequent release into nature. In addition, the indirect result of the work of the Centre is the constant accumulation of scientific information and monitoring of the fauna of bats. Thus, during the operation of the Centre, data on the hibernation of 6 species were obtained from 18 localities of Belarus (Shpak, 2017;). These data have significantly improved our knowledge of hibernating bats in Belarus.

Shpak A. Hibernating bat species of Belarus: results of the work of the Minsk bat-contact Centre // Proceedings of the Theriological School. 16 (2017): 135–141.

Case study 1.*: Bat Rescue and Rehabilitation in Serbia

Bat rescue and rehabilitation procedure in Serbia is not defined by national legislation. However, bats are strictly protected mammals by the Serbian law, and special licence for their handling and capturing is necessary. Permit for capturing and handling bats is given by the Ministry agriculture and environmental protection of Serbia. People who have permit that permit are authorized to do rescue and rehabilitation. There is still no Center for bat rescue and rehabilitation in Serbia, but since 2011 bat experts with permits have been involved in that matter. Main activities are advising people what to do if they find a bat, taking care of juvenile and injured animals and bat popularization to the general public. People call Natural History Museum (NHM) in Belgrade to report that they have found bat on the ground or in their home, and occassionally they bring the animal personally to the NHM. A smaller percent of enquiries are solved by telephone conversation, but in most cases bat experts are going to field, picking up the animal and releasing it afterwards or taking it for rehabilitation. Due to non-existence of facilities, animals are temporarily being kept in houses of authorized bat workers taking care of them. In case of larger numbers of animals rescued at the same time, a group of volunteers (mainly biology students) are involved during feeding sessions. About 10% of rescued animals are juveniles, up to 10% injured animals (most often cat atacks and broken forearms), and majority are healthy adults, sometimes dehydrated and/or underweight. 2 most frequent rescued species are Nyctalus noctula and Pipistrellus kuhlii, and occasionally Hypsugo savii, Vespertilio murinus and Pipistrellus nathusii. Carcases of bats that do not survive are being deposited in NHM mammal collection. All the work is being done on the voluntary basis and with no fundings. There is an initiative for forming an

official Center for bat rescue and rehabilitation, establishing the network of volunteers and providing funding for future activities.

Case study 1.*: Bat Rescue and Rehabilitation in Sweden

Case study 1.*: Czech Republic – animal rescue centres and bat workers in NGOs

Majority of wild animals found by public reach one of 29 animal rescue centres which are coverd by Czech Union of Conservationists and are supported from Ministry of Environments. There are also some private animal rescue centers which must meet legislation requirements. Individual persons can provide to found wild animal only first aid and then should transfer the animal to workers of rescue centre. No center is so far specialized only on bats, nevertheless there are members in NGOs focused on bats (Czech Bat Conservation Trust, Nyctalus) which cooperate with several centres. Rescue centers of CUNC have to send each year list of incoming animals to central database. Database could be shared for scientific purpose. Detailed protocols which can be used for conservational or scientific purpose fill only several centres. Carcasses of bats are provided for scientific purpose only by several centres.

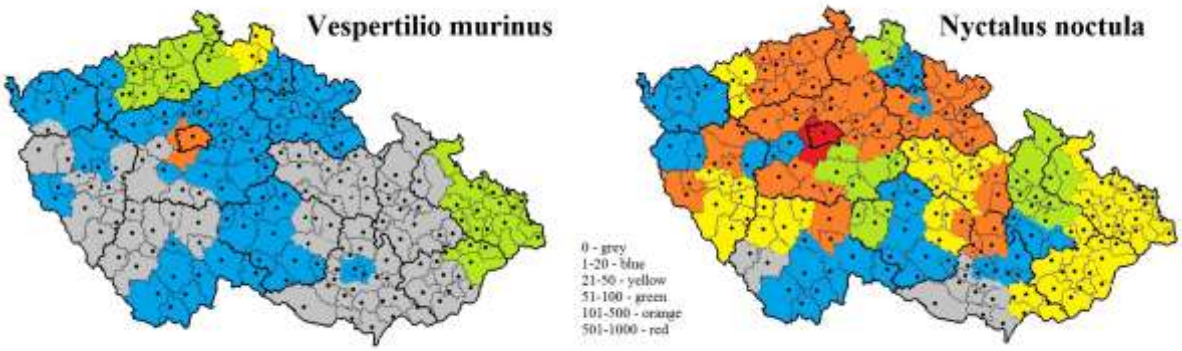


Fig. *. Occurence data of two bat species from 3-year period from 29 rescue centers in the Czech Republic (modified from Hudcová 2013).

2. Communication with public when bats are found

2.1. Basic advices

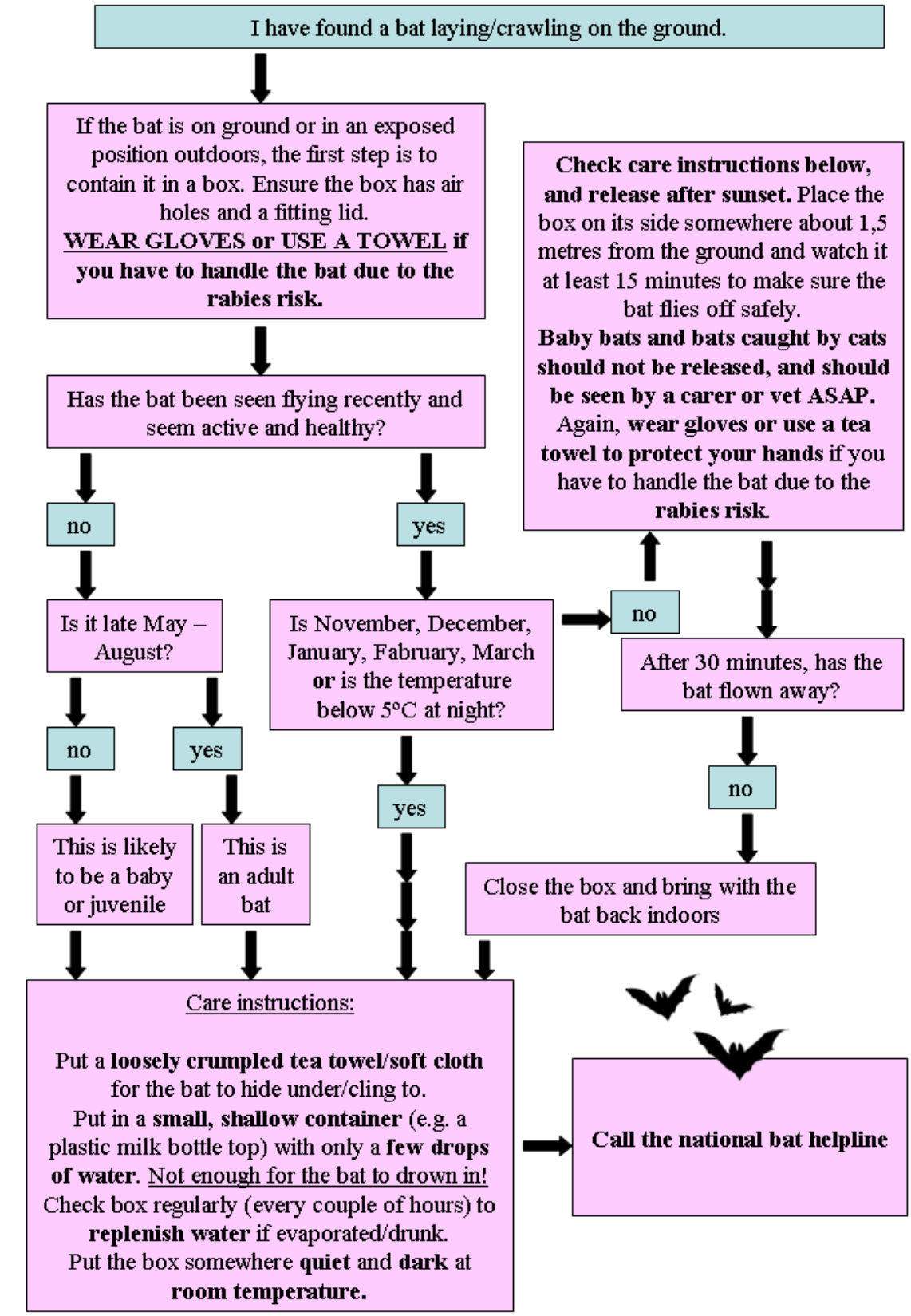
Situations for bat rescue and rehabilitation include not only contact rehabilitation cses but as well calls with questions concerning a bat occasionallly got into a room, about colony in houses, rabies, etc.

- Flight into the room by open window during nights with favourable weather conditions. Advise to enclose the bat into one single room with a window or door to the outside if possible. If it is dark outside, remove any clutter from the room and open the windows and/or external doors as widely as possible, dim or turn off the lights and let it find its own way out
- Hibernation in cellar which has openings allowing bats to leave

If bat worker recognized, that the ***manipulation with bat is necessary***, e.g. bats on ground, bat babies, bat brought by cat, unconvenient weather conditions, than he should with regard to the situation including availability or presence of national rehabilitation centres and national legislation ***recommend the finder following solutions***:

- Do not to touch a bat with bare hands, always use tough gloves or bundled piece of cloth (e.g. towel)
- In case, that there were any biting incidents, ask finder to take contacts of bitten persons or home pets and recommend to contact doctor or vet. Do not advice to release a bat. This bat should be kept separately from other bats and not released until situation is solved.
- To ask finder to put a bat or several few bats with gloves or cloth in a box with a secure fitting lid (e.g. shoe box) by putting a few small air holes into the lid of the box for ventilation. In a corner of the box should be crumpled cloth (no free long sewings, tattered edges or holes) where bat can rest and on the opposite site provide water in bottle cap (fig X). Box should be placed at quite safe room. In winter should be temperature of place cold, but not below zero, in summer the box should not be placed in direct sun. In case bat is injured, crawl, is immobile or in bad weather condition ask finder to stay in touch and wait until bat worker comes.
- If a bat appears healthy and it is adult individual which just landed on improper place, hasn't been involved in a cat attack and the weather conditions are appropriate it may be released. Ask finder to go during sunset to near suitable place (e.g. park, pond with old trees, riverside), put the open box in a place at least 1,5 m from ground and enfold the cloth partly over the top edge of box that the bat can crawl up and start from the fly up form edge of the box. Wait 30 minutes and watch the bat. The bat needs different time for warming its body for functional temperature. If the bat does not fly away within this time, take it back inside and conatct expert. Point out to take torch and gloves in case bat can not fly properly and land on ground.
- In case there is a colony in danger (e.g. felling tree, reconstruction of roost, insulation, invasions, etc.) appropriately large box or boxes should be used tha bats lay on the bottom in one layer. Providing water is not recommanded in huge amount of bats, because stressed bats often crawls and soak themselves. Ask finder to do photodocumentation of the case, especially the place, where the bats where found and take contacts if any person or company was enageged in discovery of colony or in unwanted damage of bat roost (e.g. disinfestation company, construction company, tree felling company). Priority for bat worker is to come as soon as possible.

Case study 2.*: Flowing chart of grounded bat (modified from BCT, UK



2.2. FAQ

Answer to the question are country-specific according to possibilities allowed by legislation and developement of bat or animal rescue centres, level of public interest and participation on nature protection, as well as type of problems concerning bats.

Here, we provide the "average" and possible answers to the most frequently questions which should be added with comments appropriate to the country or region.

Answers for questions are based mostly on Bat Conservation Trust (UK) experience where the bat rescue system is well developed.

Q: I have found a bat on a ground.

A: See chapter 2.1 and case study 2.1.

Q: My cat caught a bat, what o do?

A: Cats do not eat bats but they like to play with them. *If a bat has been caught by a cat it will need expert help and contact vet as soon as possible.* Even a tiny amount of cat saliva in a bat's bloodstream can cause infection and without help they are likely to die. Antibiotics are often administered under the correct supervision if there is a suspicion of a cat related injury and this practice has been found to increase survival rates. If the owner of cat is concerned about transmissions of possible infection from bat to cat, he should speak to their vet. In parts of Europe there are a two recorded cases of a virus EBLV-1, being transmitted by cats.

Advice should also be given on how the cat owner can stop bats being harmed especially if the cat is a repeat offender. Cats will often learn where a bat roost is and catch bats as they leave the roost, putting a whole colony at risk. Possible ways to reduce this risk is for the cat to be brought indoors half an hour before sunset and keep it in for an hour afterwards or all night when bats are most active (April – October). Mid-June to August is especially crucial as mothers will be raising their pups.

Q: What shall I do I have found an injured bat and there is no bat rescue person/organisation nearby?

A: If there are no carers nearby, provide the option of taking the bat to a local vet. Though the vet may not have great knowledge of bats, treating it as any small mammal may allow for a prognosis and further treatment if no one else is available.

When going through the vet advice:

- You could write the number of a bat rescue centre or carer on the box containing the bat, so the vet can seek further advice. If there is no-one available or it is out of hours, then the vet could look online for the BCT Bat Care Guidelines. Add link
- The finder should also make sure that the vet takes a note of where the bat was found and of their own contact details, so that the bat can be released when/if it recovers. Veterinary staff are supposed to record this information anyway, but often don't!
- We can email a copy of the BCT *Bat Care Guidelines* (also easily found on the web to download Add link), put them in touch with closest care contacts if possible, or potentially a bat carer who is happy to give advice remote by phone.

+ Q: It's winter I've found a bat

Legislation and then refer to subchapter 3.

Q: I have a bat roost in my house, what do I do?

A: Having a roost should not present any problems; many home-owners and tenants share their property with bats without being alerted to their presence. Bats are not rodents, and do not nibble or gnaw wood or wires, and will not generally cause any structural damage. They use existing spaces to roost, and will not bring in bedding material or food – they are clean and sociable animals which spend many hours grooming themselves. All bats in the UK are insectivores, and there are no known health risks associated with their droppings. If you need to carry out works or timber treatment, please see FAQ no xx.

Q: I have a bat roost in my house and I am planning maintenance or alterations. What should I do?

A: Bats and their roosts are protected by law whether occupied or not. It is illegal to damage, destroy or disturb any bats or roosts without having taken the necessary precautions. If you need to undertake any works that may affect your roost, it is recommended that you take the necessary precautions by seeking advice on how to do works lawfully. This advice can be provided by the relevant authority for your country. The earlier in the process the bats are taken into account, the less disruption there will be.

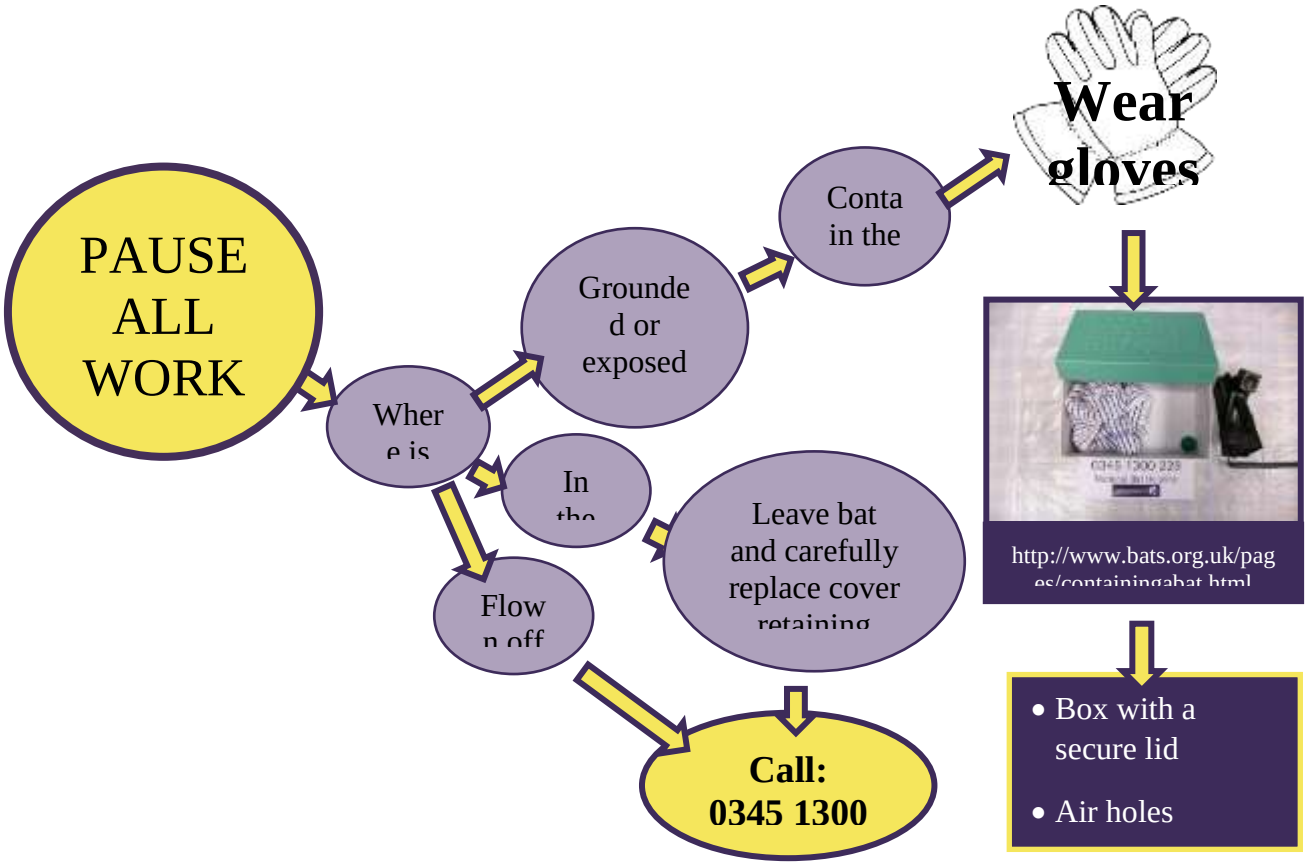
When works are planned where there is a roost, the work will need to be organised so that any risk of harming the bats or their roosts is avoided, for example, by timing operations to fit with the life-cycle of the bats. This is important not only to help protect these scarce species, but also because it will help you get the work done in the most efficient way possible within the constraints of these strict laws.

Natural England provides a free advice service for small scale repair works to dwelling places and churches where bats may be affected, and relies on the generosity of volunteers to be able to run this service. If the scale of the works is outside the remit of the volunteer service e.g. works requiring planning permission or a mitigation licence, it may be necessary to engage the services of an ecological consultant. The ecological consultant will carry out a survey and write a method statement on behalf of the person proposing the work. They will also help apply for a licence if this is necessary.

Q: What to do, if you find a bat or bat colony, during construction or timber treatment procedures?

A: If bats are discovered during work then the **work must stop immediately** until the relevant authority has been contacted and advice given.

Legislation dependent + Marnell and Presentnik 2010: Eurobats publication series no 4.



Q: How do I carry out tree works?

A: Bat populations have suffered significant declines across Europe over the past centry, and are therefore protected under the European Union's Habitats Directive in addition to country specific legislations. Bats and their roosts are protected by law meaning that it is illegal to damage, destroy or disturb bats or their roost sites. A roost is defined as any place that a wild bat uses for shelter or protection, and the roost is protected whether bats are present or not. It is the land owner's responsibility, in addition to those conducting the works, to ensure that protected species, such as bats, have been taken into account before any actions are conducted that could disturb those animals.

If you need to undertake works (pruning/felling/crowning etc.), you will need to consider if the tree has any features that could support bats. Please note that confirming the presence/absence of a roost may require assistance from a specialist with the necessary training and equipment for a full survey. If you are unsure about bat potential it is best to seek advice.

The presence of bats will not stop works, but means that advice needs to be sought on how they are to be done lawfully. If the presence of a bat roost is suspected you will typically need to seek the services of an experienced ecological consultant with knowledge of bats to conduct a survey; establishing any impacts the works are likely to have. The consultant should also be able to assist with any EPS licence application required.

If emergency situations arise where urgent tree works are necessary due to confirmed and overriding public health and safety, and the potential for bats is high or actively present, the relevant authority should be contacted for further advice.

If, after inspection the tree is deemed as low potential for a roost to be present (no potential roost sites visible on the tree), then work may proceed with care. As a precaution, and where possible, we recommend any works are conducted in September/October, to avoid maternity and hibernation seasons when bats are most vulnerable to disturbance. If the tree is to be felled then we recommend

soft felling, where tree limbs are cut and left grounded over night to allow any bats to make their way out.

Q: What to do if find a bat when felling trees?

A: As bats are protected, if you are undertaking tree works, the tree should already have been assessed for the presence/absence of bats (and relevant licences obtained if a roost is present). However, bat roosting sites can change depending on a variety of factors and therefore the presence of bats should never be ruled out completely.

If, in the unlikely event any bats or new evidence are discovered prior to work or whilst work is in progress, we advise pausing work and consulting the relevant authority immediately for further advice. This will help to avoid any harm to bats and offences being committed.

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Q: I was bitten by bat what should I do?

A small number of bats in Europe have been found to carry a type of rabies. This virus is transmitted via a bite or scratch from an infected animal so the risk is very small and is removed if you do not handle the bat. Bats seldom show any aggression but they are wild animals and may be frightened or in pain. In situations where handling is necessary, i.e. if a grounded or injured bat needs to be contained, wear protective thick gloves or use a tea towel and handle the bat as little as possible. If despite precautions you are bitten or scratched by a bat or if a bite or scratch is suspected:

Wash the area bitten or scratched immediately with soap and water for at least five minutes. Additional cleansing of the area with an alcohol base or other disinfectant is also recommended.

Seek advice from your doctor as soon as possible. (For more detailed on rabies look chapter 3.5)

Other questions:

Q: A bat in a room, what to do?

Q: A bat colony lives in my house. I don't like them. May I move them?

****

+ **Making photo**

3. Basics for handling, transporting and keeping bats

Bat care and rehabilitation is dependent on national legislation, which vary in particular countries, standart of rescue centres, number of bat workers and availability of drugs, sanitary material and possibilities of accomodation needed for proper bat care (see tab X – chapter 1.5).

3.1 Transporting bats

Particular bats can be transported both by finder and bat worker. We strongly recommend to take gloves because of rabies risk in case of escape of bat from box or manipulation by bat worker during shift bat to own transport box. Bat can be transported by finder in box recommended during trapping bat (fig. *, chapter 2.1), but the cap with the water must be removed. For shorter distances is possible to use almost any types of box with small breathing holes and no slits or holes allowing bat to escape, with crumpled cloth inside providing roost for bat.

Colonies are often found during unexpected circumstances and their rescue needs prompt act. Hold generally as described above, and the most important is choose transport box/boxes big enough that bats lay on the bottom of the box maximally in one layer to prevent souring, if possible with crumpled cloth on the bottom. The cloth must not have free long sewings, tattered edges or holes because animals can tangle themselves. Avoid to put intead fo cloth e.g. tree bark in cases of tree felling or soft insulation material when bats are found during reconstruction.

During meeting with finder, bat worker should:

- Write down the contact of finder, place and circumstances of finding and if possible to fill down information included in the protocol agreed during 7th MOP (Annex 2)
- Decide, if situation require another solution and it is necessary to contact other organization (e.g. bat experts at universities, NGOs with experiences with building renovation, officials from National conservation agencies, local authorieties, media)
- Take photodocumentation, if neccessary
- Prior transport of bat remove the water from temporary finder box or put a bat to own transport box (fig. *)

Fig. *. Transport box for one or several few bats can be small, if time of transport is not too long to cause dehydratation or souring of bat.

3.2 Basics of handling with bat and colony

3.2.1 Individual bat or few bats – entry control

After transport of bat to the rescue center or private bat worker keeping it is necessary to decide the next fate of bat. The bat should be examined with gloves. We reccomend not to use grip for forearms of bats if not necessary, because it is for bat very stressful and in case of broken or twisted arm also very painful, as well as grip for tips of wings. Bat should be hold softly, but tightly by one hand and the second hand use for examination (fig. *).

Fig. *. Examination of wings in Nyctalus noctula.

Nutrition condition of a bat

In short-haired bats, such as noctules, the condition is visible at first glance, whereas in other species bat worker must touch the site between shoulder blades and neck, and loin region to check amount of fat.

- Well-fed condition – body has „tube shape“, no depressions in loin region, condition for hibernation; in room temperature bat warm itself from low body temperature to active body temperature till 15 minutes and behave normally
- Normal condition – in loin region are slight depressions; in room temperature bat warm itself from low body temperature to active body temperature till 15 minutes and behave normally
- Lean condition – in loin region, behind neck and between shoulders are apparent depressions; in room temperature bat warm itself from low body temperature to active body temperature till 15 minutes and behave normally
- Emaciated/dehydrated condition – in loin region, behind neck and between shoulders are apparent depressions; in room temperature bat is not able to warm itself in 15 minutes, lay on bottom of box

Parasites

Bats can suffer from plenty of parasites. Bigger of them can be removed manually by pincers from hairs or membrane; tiny mites can be removed by small dought roller from flour and water. Antiparasitic preparations (both internal and external) should be used only in bat in well-fed and normal condition.

Most common injuries are:

- Torn wing membranes – holes in wings usually recover and bat is able to fly after some time, in some case even large vertical cuts healed, but usually bat with split and torn membrane is unable to fly in the future. Bats could be ranked as potentionally unable to return back to the wild, but could live in captivity without special care
- Broken fingers – according to species and range of injury bats could be ranked as usually unable to return back to the wild, but could live in captivity without special care
- Broken one limb or one forearm – according to species and range of injury bats could be ranked as mostly unable to return back to the wild, but could live in captivity if healed, mostly with some special care. Often the limb, when open fracture is identified, must be amputated (consider euthanasia)

- Broken both forearms, limb or forearm and limb – bats could be ranked as both unable to return back to the wild and live in captivity without really special care (euthanasia recommended).
- Blood around anus together with inactivity of bat when was warmed up, supposed inner injury – euthanasia recommended.
- Traces of bites on the body, torn membrane, broken arms, inactivity – euthanasia recommended. Keep the body for rabies inspection

In injured and emaciated bats we recommed to place heating stone for geckos in the box. Treatment and surgery of bats can be found in special literature (see chapter 5).

In spring, summer and early autumn bats in normal condition and slightly injuried animals can be released in suitable environment according to current weather and weatherforcast (no rain, not windy, 5°C at night at least for three days). In the winter, when outside temperature often reach values below zero, hibernate bat with well-fed condition with no visible in suitable cellar in a box with cloths from not-moulded material to hang on and a shallow bowl with water and weekly controlled.

3.2.2. Bat colony– entry control

During renovation, felling trees or autumn/spring invasions could be found numerous colonies. Especially in discovery of colonies should be bat experts and scientists informed and ivolved because both data and material could be important for conservation and public health and contribute to knowledge of species. **In case of acceptance hundereds of bats and small capacity of bat workers, it is preferable to save as many bats in normal condition as possible and in bad-injured and emaciated bats rather choose euthanasia.** It is necessary to realize, that feeding one bat take minimally 5-10 minutes/person, so colony with only 100 animals it takes 8-16 hours. After transport is necessary to separate bats into several groups:

- Dead bats (if possible, keep for scietific purpose deeply frozen)
- Ill-wounded bats – broken legs, forearms, etc. (euthanasia recomennded)
- Emaciated and dehydrated bats (in heavy cases euthanasia recommended)
- Wounded bats – broken fingers, long rupture on wing membrane (consider inclusion to permanently disabled bat if possible or euthanasia recommended)
- Slightly injuried bats – little holes in wing membranes, abrasions
- If small babies are present, let them find and attach to the mother (in abandoned pups consider euthanasia or inclusion to permanently disabled bat)
- Bats in normal condition without visible injuries
- **Females and males should be kept in separated boxes**

In **spring, summer and early autumn** bats in normal condition and slightly injuried animals can be released in suitable environment according to current weather and weatherforcast (no rain, not windy, 5°C at night at least for three days), and try to keep and rehabilitate bats, which could return back into the wild.

In the **winter** is situation in many countries different, because it is a hibernation period and outside temperature often reach values below zero. Bats in normal condition with no visible injury should be as soon as possible hibernated in suitable cellar in a boxes with cloths from not-moulded material to hang on and a shallow bowl with water, and weekly controlled. Due to stress many of

bats do not fall into the winter sleep but actively swarm in the box with following exhaustion. These individuals should be taken back into the care. We do not recommend mixing sexes, because males often harrased sleeping females and mate with them. Never put into hibernation box bats with slight injury, because even small abrasions could be infected with bacteria and inactive hibernating bats do not care about themselves.

3.2.3 Euthanasia

Appropriate methods: two phase chlorophorm inhalation; ether in some cases
Not appropriate mothods: freezing, dissection of cervical vertebrae, injections, etc .

3.3. Basics for keeping bats

The final goal of bat rescue and rehabilitation should be return of bats back into the wild. In some cases bats do not fully recover and stay as permanent disabled individuals dependent on human care. For correct type of arrangement of box interier, food and vitamins requirements, bat species should be recognized. We recommed to keep both sexes separated not to mate (especially in late summer, autumn, winter and early spring).

3.3.1 Temporary care

Plastic fauna boxes are very easily to handle, keep clean, they are available in most pet-shops and they are made in several sizes. Plastic box for temporary care should have proportions at least 40x30x30 cm or similar for 2 active bats of noctule size. In very short care it is possible to add more individuals, bat not more than 10 altogether, because of risk of bite incidents among bats and souring. In injured bats the size of used box depend on vet recommendation, and it is usually smaller. Both sexes should be kept separately. At least two walls of the box should be provided by a soft net with small mesh (1mm) , partly covered with cloth, which enables bats to use safe roost of fissure type. Bedding should not be dusty or toxic, there is good experience with some types of bedding for cats for health bats. In case of injured bats should be used easily changeable soft paper towels. Heating stones or pads placed verically in the box help injured or emaciated bats to recover. Water in shallow bowl (e.g. 1cm height) should be always present, and bowl(s) with food (e.g. live mealworms larvae) according to situation. (Fig. *).

Fig. *. Large plastic box can be used for temporary care. It is easy to handle and kept clean. Heating stone for geckos leans against the wall. From the outside is attached to the wall a plastic envelope, where information about species, care and state of bats can be stored (i will take new photo).

Basic food is reperesented by healthy mealworms (larvae only!!!) fed by various types of food (cereals, fruit, vegetable, non-toxic leaves, vitamine mixture, etc.), soluble vitamines could be added to the water. Some species lives quite well on this diet (pipistrelles, noctules, vespertilio, serotine), in some species it is neccessary to add crickets, beetles, wax-moth larvae, etc.

Species mostly accepted to the rescue centers are ***aerial insectivors*** and they are used to seek their food in the air, so it depends on species and adaptability of each individual, when it learns to look food in the bowl. At the beginnig it is usually neccesary to feed them by hand.

Before feeding, bats must be warmed up to their normal body temperature. The bat should be held in the hand with gloves softly, but tigtly, wrapped by fingers, or soft towel can be used instead a hard gloves. The feeding room should be quiet and not with sharp light. Water should be provided during the first feeding by syringe, when bat is licking the tip of it (not allow the water to spirth

forth). Mealworms should be killed and decapitated, that the bat can lick its guts, until the bat is eager to eat them. It is better to offer melaworms by pincers from below, because bat learns to seek food on the ground. It can speed up the process of feeding from the bowl (fig. *) . When mealworms are too small and bat worker has many bats to feed, it is possible to use hand blender to make smooth mealworm mash with addition of little amount of water and feed bats by syringe. Bats in normal condition should be fed once a day during evening.

Fig. *. Bat can be held during feeding in a glove or in a towel to prevent bite incidents. If the grip is tight, but soft, many bats stay calm and cooperate. (new photo, hand should not be without glove)

In emaciated bats it is important to recognized the current state. At the beginning it is better to provide Ringer solution and Glucose (G5) by infusions, or per mouth slightly sweet solution of glucose and water. If the bat reacts normally, and actively wants water, it is possible to feed him afterwards, but preferably only by guts and only by some few mealworms. Another feeding and providing water with glucose should be done after several hours. Following days the amount of mealworms should be gradually increased according the state of the bat.

Non-volant juveniles are often found during summer. Bare and blind juveniles should be fed several times a day by pup milk formula for cats or dogs and gradually during following days add guts of mealworms and later mixed whole mealworms. Heating pads or stones should be placed in the box. If it is possible to make a group of juveniles or add a juvenile to its own species, they seem to face up the orphanhood much better. If there are not conditions in a rescue center to prepare orphaned bats to return back into the wild, it is recommended not to release them. Care of non-volant juveniles is time-consuming and not always succesfull. If there are not conditions to provide proper car, consider euthanasia.

Hibernation in winter is possible only for health bats without any visible injury. In the box should not be any material, which could mould, but provide water in a shallow dish. Noctules, pipistrelles, parti-coloured bats and serotines tolerate relatively dry air in a cellar with relatively stable temperature – if the cellar is good for storage of potatoes and apples, it is suitable for these species. Never mix sexes in hibernation boxes. During hibernation, when activity is very low, plastic box 40x30x30 cm is sufficient for 10 bats of size of noctule bat. During hibernation bats should be controlled. After awaking in spring, some bats are able to be released the same day, some must be fed for several days to reach correct condicition.

Bat mating season lasts during the autumn, but they can mate also during winter and probably also during early spring. Injured females accepted to the centres can be fertilized or pregnant and can give birth in captivity. Fate of juveniles depends on circumstances (e.g. group of juveniles and

adult bats of the same species, outer bat aviary, mother care of baby), but hand-raised pups should not be released. Also, preterm pregnancy could occur in females, which were not hibernated due different reasons and centres should be get ready for this.

More information about bat care can be found in special literature (see chapter 5)

3.3.2 Keeping permanent disabled bats

Permanent disabled bats could be used in environemental education programs. They should have much bigger boxes (e.g. modified wardrobe) with several roosting possibilities, clothes, curtains, etc., with access to water and food (fig. *). If they are capable of gliding flight, the box should have proportions to enable at least short gliding flights. Also it is recommended to make a couple of the same sex or a small colony in pipistrelles, noctules, vespertilio, because in these species even males make one-sex groups and are very social. It is not necessary to be the same species, but it should be rather similar sized species. Long-term care of bats, housing, food and vitamine requirements, possible diseases, etc. can be found in special literature (see chapter 5).

Fig. *. Example of interior design for permanent disabled bats, which do not need special care

3.4 Relase into the wild

Care of bats is time consuming activity, and thus it is important to consider well all circumstances of succesfull release. Flight ability should be always confirmed, because there are some hidden injuries, which do not allow bat to fully control his wings. The bats should be released on the place of finding and if it is not possible or suitable, than on the biotope prefered by particular species, after sunset. River or water body with older trees on the place of release are favourable for many species. The weatherforcast should be kind at least three days (not windy, no rain, at least 5°C in night). The open transport box should be placed at least 1,5 m from ground and cloth or mesh partly enfolded over the top the edge of box, that the bat can crawl up and take off from the top edge of the box. The bat needs different time for warming its body for functional temperature, so it is necessary wait about 15-30 minutes and watch the bat. Some bats warmed themselves during transport and they fly up immediately, but some can be still in torpor. If the bat does not fly away within this time, it should be checked for inconspicuous injuries. Gloves and powerful torch should be in basic equipement.

Release of colony in favourable conditions is possible to use for public education and medialization.

3.5. Health risks for bat rehabilitators

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3.5.1. Bat rabies

Rabies is an infectious disease caused by the classical rabies virus and related viruses. These viruses belong to the family of the Rhabdoviruses and to the genus Lyssavirus. So far, 13 genotypes of Lyssavirus has been found in bat species, of which 5 in European bat species.

Genotype 1 includes the classical rabies virus that can occur almost globally in terrestrial mammals, such as foxes and dogs, but is also regularly found in bats on the American continents and surrounding island.

European Bat Lyssavirus-1 (EBLV-1 is, so far, only found in the Serotine Bat, *Eptesicus serotinus.*

European Bat Lyssa Virus-2 (EBLV-2) is found in Daubenton's Bat, *Myotis daubentonii* and in the Pond Bat, *Myotis dasycneme.*

Bokeloh Bat Lysavirus (BBLV) has been found, so far, in 3 cases in Natterer's Bat, *Myotis natereri* in respectively Germany and France.

West Caucasian Bat Virus (WCBV) has been found in South-eastern Europa in the genus *Miniopterus.*

Lleida Bat Lysavirus (LLEBV) has been found in Schreiber's Bent-winged Bat, *Miniopterus schreibersii,* in Spain.

+ Kotalahti bat lyssavirus

The transfer of rabies infection can take place by a bite, but also by contact with saliva or urine of infected animals through mucous membranes or open injuries of the skin. The rabies virus is mainly found in the saliva. Infected saliva can also be transferred on the animal's fur during grooming. After the death of an infected animal, the virus can remain alive for a period of about two weeks at a normal temperature and even many years at freezing temperatures. After an infection, the virus moves subcutaneously through the nervous system at a rate of 3-4 mm per hour to the central nervous system. There, multiplication of the virus takes place in the neurons. From the central nervous system the virus spreads through the nervous system further into the body.

The incubation period varies and depends on the distance between the place where the infection occurred and the central nervous system. The concentration of the inserted virus particles can also play a role in this. The virus is not spread through the blood circulation.

People infected by rabies virus show first some flu-like symptoms that hold for two to four days. Afterwards, the affected nerves feel painful and a distinct fear of swallowing is felt by painful cramps of the swallowing muscles. Subsequently, paralysis of the respiratory muscles occur, and death will usually follow shortly thereafter. There are no tests that can show or exclude an infection with rabies virus at an early stage before the symptoms of rabies are shown.

Bats infected with rabies virus do not show aggressive offensive behaviour. Rabies virus affects the central nervous system. As a result, paralysis symptoms occur and the emitting and receiving of echolocation does not function properly. In the first phase when the disease manifests itself, the animals show by the paralysis an uncoordinated flight behaviour and can thus fly against objects or sometimes also against humans. This is sometimes misinterpreted as an attacking behaviour. Animals can already be contagious before they already show signs of the disease.

In the next phase the animals can no longer fly and are then sometimes found on the ground, so that they can be easily caught by cats and people. When irritated by high sounds, the animals often show long loud screams. This does, however, not necessarily indicates rabies. The Parti-coloured Bat, *Vespertilio murinus,* shows approximately the same persistent screaming behaviour in case

of disturbance during hibernation or lethargy. Also, persisting bite behaviour (Pitbull-terrier-bite behaviour) in an object is a phenomenon that can occur at this stage. After the animals have become completely paralyzed, they die shortly thereafter. However, most of the bats that are found to be depleted or apparently ill are not infected with rabies virus.

Since 1977, five people in Europe have died from bat rabies, two children in the former Soviet Union, a bat researcher in Finland, and an amateur bat conservationist in Scotland. The genotype of the rabies virus from which the first child passed away. The second child was infected with EBLV-1 and the other two fatal cases with EBLV-2. There may also be a fifth case in the Ukraine, but it is not known about the genotype of the virus and the bat species that had inflicted a bite. This number of deaths is remarkably low when realized that many amateur bat workers, students and professional scientists have been dealing with a study of Serotine Bats or other bat species and have often worked with unprotected hands, with regular bite contacts, while these individuals were not vaccinated against rabies. In addition, many others will have been in direct contact with bats and have also suffered from bites, without being vaccinated preventively or curative.

It seems that people are likely to be significantly less susceptible to an infection with one of the EBL-viruses than for an infection with the classical rabies virus. But there is also evidence that the concentrations of EBL-viruses in the salivary glands of infected bats are relatively low, so that at a bite only relatively few virus particles are transferred. Nevertheless, any unnecessary direct contact with bats will have to be avoided. When handling bats, and certainly live and dead Serotine Bats, it is advisable not to handle these with unprotected hands.

Bats, which have inflicted a bite or which otherwise have had direct contact with damaged skin (hands) or mucous membranes and which are still available, should be examined for rabies as soon as possible. Dead bats with direct contact with men or pets should also be made available for rabies testing as soon as possible. A live bat that has caused a bite case should be offered to for euthanasia and should be submitted for rabies examination.

Pets who have been in direct contact with bats should be vaccinated against rabies for safety as soon as possible by a veterinarian. However, most contact cases between bats and pets are not observed and there is usually no vaccination in these animals. A natural transfer of bat rabies to dogs and cats has not yet been demonstrated, although a cat in France showed contamination with EBLV. This can be an indication that dogs and cats and possibly other terrestrial mammals are also not very susceptible to an infection with one of the EBL-viruses.

Cats are also significantly more in direct contact with bats than dogs. Only at a fraction of the cats who have been in contact with (rabid) bats is observed that this contact has taken place.

There is no public health reason to exclude colonies of Serotine Bats or other bats species from roosts such as cavity walls, to prevent the transfer of rabies to humans and pets. In the first place, the bats present do not have to be carriers of rabies, and when eamination shows that infected animals have probably been present in a colony with rabies virus, it is probably better not to take measures. In colonies where rabies infected bats have been found, most of the animals, including the young, are simply surviving. Most likely, the immune system of these animals builds sufficient resistance to rabies, so that such a colony is free of rabies for a long time and therefore does not constitute a nidus of any possible contamination.

Medical treatment

People who may come into contact with bats because of their work should take the necessary precautions. Direct body contact with bats should be avoided as much as possible. Although there is very little chance of being infected with bat rabies virus, preventive vaccination against rabies is highly recommended in a number of cases. If necessary, vaccination may be carried out in consultation with a family or company doctor or with an area health authority.

If a bat has been bitten or has had direct hand contact, the following actions should be carried out as soon as possible:

• Wash the bite spot /or hands well with water and soap in running water for 10 minutes

• Disinfect the bite spot and/or hands with alcohol 70% and if not available with ordinary household methylated spirit or betadine iodine 10%

• Contact immediately the family or company doctor or with an area health authority.

The administering of rabies vaccinations is done on the basis of schemes recommended by the World Health Organisation (WHO). A distinction is made between preventive and treating or curative (post-exposition) vaccinations.

In the case of preventive vaccination, on days 0, 7 and 21 (day 21 may also be day 28) each time 1 ml rabies vaccine is injected into one of the upper arm muscles. Thereafter, in principle, an injection (booster vaccination) of 1 ml of vaccine can suffice every two years. A revaccination can be delayed for an extended period of time when a titre of antibody in the blood reveals that there is still sufficient immunity to rabies. Excessive vaccination can lead to side effects. Should a bite of a rabid bat occurred within two years of vaccination, a post-exposition vaccination will be advised on days 0 and 3, unless the titre is ≥ 1.0 IU/ml. This scheme can also be held when the last vaccination occurred between 2 and 10 years ago and the vaccination commences within 24 hours of the bite of a rabid bat.

Anyone who has been bitten by a rabid bat or has had any other direct contact with that animal, or has had such contact with a bat that could not be examined for rabies, and has not previously been vaccinated against rabies, needs a more extensive post-exposition vaccination on days 0, 3, 7, 14, 30 and 90, each with 1 ml of vaccine. When this post exposure vaccination commences within 5 days of contact with a bat, usually, certainly with a serious injury, also human anti-rabies immunoglobulins (HARIG) should be administered when the vaccination on day 0 take place. The dose of HARIG to be administered depends on the body weight of the person concerned.

Rabies vaccine is not cheap and HARIG is even very costly. It is, therefore, very important to let examine a rabies suspected bat, which caused a bit contact, as quickly as possible, so that the treatment can be stopped in case of a negative rabies test. People who, in connection with their work, are likely to come into contact with bats in several occasions, could be considered to be on the schedule of preventive vaccination in such a case.

Persons, who can regularly come into contact with wild animals and therefore can incur injuries by bites or scratch, are advised to also be vaccinated against tetanus. An infection with the tetanus bacterium, *Clostridium tetani,* can have a very serious course and can lead to death. The procedure for preventive vaccination and the post-exposition treatment against tetanus is not discussed here. After a preventive vaccination, a revaccination (booster vaccination) is usually only necessary after 10 years. The symptoms of tetanus are untreatable. (by P. Lina)

3.5.2. Allergy to bat fodder

Some people can develop allergic reaction to fodder for bats in captivity (*Tenebrio molitor*, *Zophobas morio*), specificallly to insects' frass and scales. The symptoms include allergic conjunctivitis, rhinitis, eczema, asthmic problems and in serious cases also anaphylactic shock. It is recomended to keep mealworms outside living space; the type feeding can also reduce amount of microscopic fragments, which are airborne (e.g. oat flakes instead of bread or meal products).

4. Bat rescue and rehabilitation for bat research, conservation and public education

In the rescue centers are yearly accepted thousands of bats of differents species and thus represent a huge store of data. If there is no connection between rescue centers and bat specialists in the country, information about bat species occurence, disease (e.g.rabies), roost biology and related

conservation problems (e.g loss of roost or damage of colony by renovation, insulation, felling old trees) are lost. Often it is very hard to establish cooperation between centres and NGOs or individual bat workers and sometimes it is even impossible. Rescue organization can keep no evidence of findings or they can have own databases, which are not willing to share. Even if they are willing to share their database, if they have no bat expert at the center, identification of species is however often uncorrect (e.g. all small bat species including small Myotis and Hypsugo assigned to genus Pipistrellus, etc.). If the cooperation is possible even in small steps, both conservation organizations or universities and rescue centers can profit (e.g collective grants, collective public events, medialization which can attract donators, etc.).

Cooperation with rescued centers with shared database, where bats are identified by bat expert, can be migthy tool in especially in countries with few bat specialists, and can be used as method for: bat monitoring, bat conservation, bat biology studyings, parasitological, virological reserch, and for public education. Not survived animals are the sourch for the replenishment of museum collections.

4.. Source of new faunistic data*

Case study 1.*: Ukraine: Contact-centres and new descoveries

4.. Bat monitoring*

Every year huge amount of reliable data can be evaluated; evalutaion of IUCN status and EU states conservation status,

4.. Bat conservation*

– protection of particular bat roosts and huge bat colonies, prompt act during reconstruction or felling trees, etc.,

4.. Bat biology studyings*

– roosting preferences, migration behaviour, seasonal pattern of occurence, strucure of hibernating or invasive colonies, etc.,

4.. Bat histopatalogy and parasitology*

– dead bats or bats with suspicious behaviour are valuable material for epidemiology research (e.g rabies) or can be used as bioindicators by chemical analysis (e.g. traces of lead, insecticide), etc.,

4.. Zoonotic deseases*

Case study 1.*: the Netherlands: rehabilitation centres and bat rabies surveillance

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4.. Public education*

– if the legislation of country permits, disabled bats kept in rescue centers and acumstomed to handling and petting can be used at public events as well as for education training for officials, insulation companies or forestry staff.

Holding annual **International Bat Nights** is good possibility for establishment the cooperation between bat workers and rescue centres. Captive disabled bats represent an important educational tool for their wild counterparts. Only bats that cannot be released back into the wild should be considered for education and the possible use is restricted to natural temperament, species of bat and actual condition. One of the most popular, social and generally easily tamed species is noctule bat. On the other hand, species that are considered high disease risks (such as Daubenton's bats, serotines, pipistrelles) should not be used widely for public engagement events. To reduce the risk of transmission of zoonotic disease any bat to be used for education must be kept isolated from other bats for at least six months. This isolation period is essential to ensure the health and safety of the bat, the handler and the general public.When using a bat for education the following should always be considered:

- where handled, bats should always be shown in gloved hands,
- the general public should not be allowed to handle the bats,
- showing of a bat in the hand should only constitute few minutes of a talk, the bats have to be used for handling and stay calm during manipulation
- the welfare of the bat should always be a priority, and sufficient food and water provided to the bat as required.
- until the bat is needed, it should be kept out of sight and in a secure box where it is comfortable and its welfare needs are met, and covered so that the bat does not undergo any additional stress.

Caution on species used in demonstrations. There is information that representatives of some species are critically stressed because of touching (e. g. *Plecotus auritus*). Such species should not be used for contact demonstation. The most appropriate species (of European fauna) seems to be Nyctalus noctula. It 's comparatively big and stands well touching and stroking.

Case study 4.*. Serbia: bats use for public education

Non-releasable bats and bats in rehabilitation are being used for bat popularization and education of general public. Most commonly we have *Nyctalus noctula* and *Pipistrellus kuhlii*. Those animals are being shown to people during International bat night events. Occassionally we organize lectures in schools and kindergartens, where kids can see and touch them. Few times we organized "feeding" events where children came with their parents, and assisted during feeding sessions. Also, few times we were releasing bats in front of the "audience" – for example, once a girl rescued a grounded bat that she found in the school yard. After one week of rehabilitation, animal was ready to be released back to the nature. That girl came together with her parents and school friends to watch that bat being released and flying away.

4.. Destination of dead bats*

Dead bats should never be thrown away because they still can be used for many scientific purposes. Non well documented bats can be used for educational purposes. Private collections have hardly any scientific value and are usually not accessible to researchers, so that in fact research material is lost.

The purpose of reseacrh on a dead animal determines how it should be kept for the time being. It is important that the information about an animal, such as the finding location and date and its conditions, are recorded as accurately as possible and attached with a label to the animal. Animals of which material should be used for toxicological research (e.g. pesticides), DNA analyses, rabies research, or other disease tests should be kept at-10 to-20 °C. In any case, they should not be kept in alcohol, formalin or other preservatives.

In order to prevent the drying out of the animals in a freezer, small bats, like the Common Pipistrelle Bat, can be stored in, for example, a small plastic or glass medicine jar.

Larger animals can, for example, be kept in larger glass or plastic medicine jars or in a plastic food box. Dead animals can also be wrapped in aluminium foil. For some research, the animals should be delivered deep-frozen.

Consult the concernd researcher how this can be achieved. Animals for toxicological research should be sent to a research institute as soon as possible, as some substances can quickly disappear from a dead animal. Dead animals for scientific museum collections or for research on endoparasites can be stored frozen or in alcohol (preferably ethanol) 70-96%. In case ethanol is not availble, household methylated spirits can also be used.

Preserve the animals never in formalin. Make with a scalpel or a pointed scissors a small, long cut of about 5 mm in the abdominal skin, so that the preservation fluid can penetrate the inner side of the bat as well. When more animals are kept together, each animal should be labeled with the requirede data, so that exchange of such data cannot take place. The data can best be written with a pencil, Indian ink or any other alcohol proof ink on the label which can then be attached with a thin string or cotton thread to one of the hind legs of the bat.

As said before, dead bats of which no proper finding data are known, can be used for educational purposes. Of dead bats which have already been dissolved, the skeleton material can still be used for a scientific museum collection.

Dead bats should be mailed in a sturdy box and not in an envelope, even not in a blister envelope. Animals that are not treated with a preservative are first wrapped in a plastic bag and then wrapped with paper. Never send dead animals just before a weekend or before general public holidays. Send dead animals per priority mail. Both the post(wo)man and the recipient will not appreciate stinky parcels. Dead bats can, of course, also be delivered at the visiting address of the concerning research institutes. (by P. Lina)

Case study 4.*: Czech republic – colony in gas-heaters: cooperation between NGOs Nyctalus, Czech Bat Conservation trust and media

In old estate in Prague many households use gas-heaters. The vents of gas-heaters are covered by various types of metal equipement, which should protect invasion of birds and light waste. Bat rehabilitators were called by neighbour, because owner did not care about bats, and he used gas heater even when bats were present. After strong reproof, he let dismantle the gas heater, and took out 24 dead and dying burned bats and 13 alive bats. We asked other neighbours and discovered that this roost was traditionally inhabited during autumn migration and also during hibernation. The case was medialized, and thus other new cases of bats in gas-heaters were reported including regular occurence of colonies (Zieglerová et al. 2016). This case was also assigned to Czech Bat

Conservation Trust, which suggest and realized acceptable solution of this problem, and to Czech Inspection of Environment.

Fig. *. Noctules squeeze through horizontal fissures in metal protection and invade to gas heater and according the type they can be imprisoned here. Distress calls of bats often lure other bats. Once the heating season starts, bats are burned alive.

Box case study 4.*. zpracovat výsledky těch grafů, co jsem měla v tom boxu; info bats in Prague, Hsav, trendy, aj.

Box case study 4.*
Education – programy pro děti a pro ostatní s captive bats. Česon a Nyctalus.
Dan Horáček!!! (IBN) ČESON
nyctalus (akce o netopýrech s handicapy; bez hednikepů o netopýrech v průběhu let)

5. List of manuals and guidelines on bat rescue and rehabilitation

Based on answers to questionnaires (2015). Should be recirculated and, possibly, updated.

5.1. General

Barnard, S. M. Bats in captivity. Vol. 1. Biological and Medical Aspects. Logos Press, 2009.
Barnard, S. M. Bats in Captivity–Volume 2: Aspects of Rehabilitation. 2010.
Barnard, S. M. (ed.). Bats in Captivity–Volume 3: Diet and Feeding-Environment and Housing. Logos Press, 2011.
Barnard, S. M. Bats in Captivity, Volume 4: Legislation and Public Education. ***.
Lollar, A., & French, B. A. S. (1998). Captive care and medical reference for the rehabilitation of insectivorous bats. Bat Conservation Intl.

5.2. Regional

Country	Language	References
Czech Republic	Czech	Jahelková, H., Hájková, P., Bláhová, A. 2009. Péče o netopýry: Metodika péče o nalezené, zraněné a hendikepované netopýry, č.21. Český svaz ochránců přírody, MŽP.
France	French	There is only one guideline published in France it‘s only restricted to a few people. See the Natury History Museum from Bourges.
Italy	Italian	Dondini G. & Vergari S. (1998). Manuale per la conservazione dei pipistrelli. Mem.Museo, Riserva Nat. Or. Onferno, 1: 1-52 pp. Linee guida per il primo soccorso. PDF by GIRC on www. pipistrelli.org
the UK	English	Bat Care Guidelines and 2013 Update, BCT http://www.bats.org.uk/pages/batcare.html Bat Rescue Manual Maggie and Bryan Brown 2006. Available from the West Yorkshire Bat Hospital Bat Care News, a newsletter published quarterly (mostly) by Maggie Brown, includes new advice and information for bat carers.
Ukraine	Ukrainian, Russian	A general description of the scheme used in Ukraine for rescue of bats in winter may be read at the web-site of Ukrainian Centre of Bat Protection: L. Godlevska. How bats are rescued in winter. 2014. – http://kazhan.org.ua/ukr/library/rehab.htm (in Ukrainian); http://kazhan.org.ua/rus/library/rehab.htm (in Russian).

6. List of national bat rescue and rehabilitation centres

Based on answers to questionnaires (2015). Should be recirculated and, possibly, updated (2018 eurobats and ask all if agree to be here).

Country	Name	City	Organization	Contacts
Bulgaria	Elena Stoeva	Stara Zagora	Green Balkans	etilova@greenbalkans.org
	Antonia Hubancheva	Sofia	BRCC/NMNHS	a.hubancheva@yahoo.com
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Czech republic	Helena Jahelková	Prague	Nyctalus	helena.jahelkova@seznam.cz
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France	Laurent Arthur		Muséum d'histoire naturelle de Bourges	Laurent.arthur@ville-bourges.fr
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	Keith Redford	Oslo	Norwegian Zoological Society	

Country	Name	City	Organization	Contacts
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Country	Name	City	Organization	Contacts
	Mária Apfelová	Martin	State Nature Conservancy of SR, Velka Fatra NP Administration	maria.apfelova@sopsr.sk
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Slovenia	Zlatko Golob	responsible for whole Slovenia	Golob d.o.o., Zatočišče za živali prosto živečih vrst	golob.doo@gmail.com
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UK /England	Maggie Brown	West Yorkshie	West Yorkshire Bat Hospital	batcarenews@phonecoop.coop
	Jan Ragg	Essex	Essex Bat Group	jan.ragg.t21@btinternet.com
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Country	Name	City	Organization	Contacts
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Ukraine	Lena Godlevska	Kiev	Schmalhausen Institute of Zoology	lgodlevska@gmail.com
	Alona Prylutska	Kharkiv	Bat Rehabilitation Center Feldman Ecopark	alenagukasova@gukasov.net

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***

Literature

A. Summarizing descriptions of bat rehabilitation approaches in different countries

Bulgaria

Translation HJ, probably also comm of Bulg people (elena stoeva info)

Czech Republic

Jahelková, H., Hájková, P., Bláhová, A. 2009. Péče o netopýry: metodika péče o nalezené, zraněné a hendikepované netopýry, Český svaz ochránců přírody, 111 pp. http://www.ceson.org/document/metodikapeceonetopyry.pdf

Norway

van der Kooij, J. 2007. Norsk Zoologisk Forenings flaggermusmottak – fem år har gått [The Norwegian Zoological Society's bat care centre – five years of practise] - Fauna, Oslo 60 (3-4): 183-189 (in Norwegian, English figure texts and English summary).

van der Kooij, J. 2010. Bat Care. What are the benefits? - Powerpoint presentation at the Pre-Symposium Bat Care Workshop at the 2nd International Berlin Bat Meeting.

van der Kooij, J. & Gebhard J. 2010. A practical approach to the successful release of hand-reared bats. - Powerpoint presentation at the Pre-Symposium Bat Care Workshop at the 2nd International Berlin Bat Meeting.

van der Kooij, J. 2013. Fledermauspflege Norwegen – Wie und wieso? - Powerpoint presentation at the Pre-Symposium Bat Care Workshop at the 3rd International Berlin Bat Meeting.

van der Kooij, J. Bat Care in Norway – 12 years of practise. In prep.

[The Norwegian Zoological Society's bat care centre – five years of practice] - Fauna, Oslo 60 (3-4): 183 -189 (in Norwegian, English figure texts and English summary).

Slovenia

General reports summing together work of SDPVN members:

Podgorelec, M., (in press). Odziv na klice javnosti v zvezi z netopirji (2012, 2013). Glej, netopir! Ljubljana 10(1): xxx - Podgorelec, M., 2011. Odziv na klice javnosti v zvezi z netopirji (2010, 2011). Glej, netopir! Ljubljana 8(1): 29–31. (http://www.sdpvn-drustvo.si/FOTKE/PROJEKTI/Publikacije/glej_netopir_8-01.pdf)

Petrinjak, A. & L. Likozar, 2009. Halo, halo, tu netopir, potrebujem pomoč. Glej, netopir! Ljubljana 6(1): 41–43. (http://www.sdpvn-drustvo.si/FOTKE/PROJEKTI/Publikacije/Glej_netopir_09.pdf)

Wildlife shelter apart from early publication (Orehar, 2009) in its publicly available reports (http://www.arso.gov.si/narava/%C5%BEivali/zato%C4%8Di%C5%A1%C4%8De/) doesn't reports specifically on of number/species/ locations/ survival rate ob bats.

Orehar, N., 2009. Pomoč poškodovanim netopirjem. Glej, netopir! Ljubljana 6(1): 44–45.

http://www.sdpvn-drustvo.si/FOTKE/PROJEKTI/Publikacije/Glej_netopir_09.pdf\

Switzerland

Handbuch Fledermaus-Notpflege (Vers. 2014/1 in Überarbeitung) für die fachspezifische berufsunabhängige Ausbildung (Art. 192 Abs. 1 Bst. b TSchV) (Bewilligung-Nr. 13/0028 Stiftung zum Schutze unserer Fledermäuse in der Schweiz, Dr. Hans-Peter B. Stutz).

The United Kingdom

Bat Care Guidelines and 2013 Update, BCT http://www.bats.org.uk/publications_download.php/1114/Bat_Care_Guidelines_Update_2013_May_2013.pdf

Bat Rescue Manual, Maggie and Bryan Brown 2006. Available from the West Yorkshire Bat Hospital http://www.bats.org.uk/pages/batcare.html

B. Estimation of numbers of received and released bats

Hudcová, S. 2013. Analýza nálezových dat výskytu netopýrů na území hlavního města Prahy a v jejím okolí související s lidskou činností. Diploma thesis (in Czech language with English summary). – soon prepared for publication

van der Kooij, J. 2007. Norsk Zoologisk Forenings flaggermusmottak – fem år har gått [The Norwegian Zoological Society's bat care centre – five years of practice] - Fauna, Oslo 60 (3-4): 183 -189 (in Norwegian, English figure texts and English summary).

van der Kooij, J. Bat Care in Norway – 12 years of practice. In prep.

Serangeli M.T., Cistrone L., Ancillotto L., Tomassini A. & Russo D. (2012). The post-release fate of hand-reared orphaned bats: survival and habitat selection. Animal Welfare 21: 9-18.

C. Bat rehabilitation records for collecting additional faunistic data

Ancillotto L., Serangeli M.T. & Russo D. (2013). Curiosity killed the bat: Domestic cats as bat predators. Mammalian Biology. 78: 369-373

Godlevsky L., Tyshchenko V., Negoda V. First records of Pipistrellus kuhlii from Kyiv // Vestnik zoologii. – 2000. – T. 34, № 3. – P. 78.

Godlevska L. V. Results of the work of the bat contact-centre (Ukraine) // Scientific Notes of Taurida V. I. Vernadsky National University. – Series: Biology, chemistry. – 2012. – Vol. 25 (64), No 4. – P. 12-20. (In Russian with English summary.)

Godlevska L. V. New Vespertilio murinus (Chiroptera) winter records. An indication of expansion of the species' winter range? // Vestnik zoologii. – 2013. – T. 47, №3. – C. 239-244.

Hanák V., Neckářová J., Benda P., Hanzal V., Anděra M., Horáček I., Jahelková H., Zieglerová A., Zieglerová D. 2009. Fauna netopýrů Prahy: Přehled nálezů a poznámky k urbánním populacím netopýrů. Natura Pragensis 19, pp. 3-89

Hudcová, S. 2013. Analýza nálezových dat výskytu netopýrů na území hlavního města Prahy a v jejím okolí související s lidskou činností. Diploma thesis (in Czech language with English summary). – soon prepared for publication

Jahelková H, Neckářová J., Zieglerová A., Zieglerová D. 2008. Nové nálezy zimujících netopýrů rodu Pipistrellus sp. v Praze a okolí. Vespertilio 12: 27-32

van der Kooij, J. 2007. Norsk Zoologisk Forenings flaggermusmottak – fem år har gått

Lehotská, B., 2006: netopiere (Chiroptera) urbanizovaného prostredia Bratislavy. In: Acta Environmentalica Universitatis Comenianae. – Vol. 14, No. 2, p. 55-63. http://www.fns.uniba.sk/fileadmin/user_upload/editors/actaenvi/ActaEnvi_2006_2/07_Lehotska.pdf

Likozar, L., 2011. First record of Savi's pipistrelle Hypsugo savii (Bonaparte, 1837) in NW Slovenia. Natura Sloveniae, Ljubljana 13(1): 63–64. (http://web.bf.uni-lj.si/bi/NATURA-SLOVENIAE/pdf/NatSlo_13_1_8.pdf)

Mastrobuoni G., Gaiba G., Ragno R. 2005. Prima segnalazione per il Lazio (Italia Centrale) di Vespertilio di Bechstein, Myotis bechsteinii (Chiroptera: Vespertilionidae). Boll. Mus. reg. Sci. nat. Torino 22: 525-530.

Podgorelec M., Petrinjak A., Mlakar J., Kaučič R., Zidar S., Presetnik S., Zagmajster M., Knapič M., Likozar L. Voluntary helpline provides important data on bats in Slovenia // 13th Bat Research Symposium. – poster & abstract.

Presetnik P., K. Koselj, M. Zagmajster, N. Zupančič, K. Jazbec, U. Žibrat, A. Petrinjak & A. Hudoklin, 2009. Atlas netopirjev (Chiroptera) Slovenije, Atlas of bats (Chiroptera) of Slovenia. Atlas faunae et florae Sloveniae 2. Center za kartografijo favne in flore, Miklavž na Dravskem polju, 152 str.

Presetnik, P., M. Podgorelec & A. Petrinjak, 2013. Is the parti-coloured bat Vespertilio murinus Linnaeus, 1758 a common bat species in Slovenia? Natura Sloveniae, Ljubljana 15(2): 39–50. (http://web.bf.uni-lj.si/bi/NATURA-SLOVENIAE/pdf/NatSlo_15_2_4.pdf)

Shpak A. Bats of Minsk (Belarus): species composition, habitat ecology and features of hibernation // 3rd International Berlin Bat Meeting: Bats in the Anthropocene. – 2013. – P. 83.

SDPVN yearly publication Glej, netopir! (http://www.sdpvn-drustvo.si/zlozenke.html)

Serangeli M.T., Cistrone L., Ancillotto L., Tomassini A. & Russo D. (2012). The post-release fate of hand-reared orphaned bats: survival and habitat selection. Animal Welfare 21: 9-18.

Tyshchenko V. M., Godlevska O. V. First winter records of Vespertilio murinus and Nyctalus noctula (Chiroptera) in Kyiv // Vestnik zoologii. – 2008. – Vol. 42, № 3. – P. 280. (In Ukrainian.)

Vlaschenko A.S. Record of hibernated Nyctalus noctula in Kharkov // Vestnik zoologii. – 1999. - 33 (4-5). - P. 76. (in Russian)

Vlaschenko A. S. Sex ratio in four bat species in north-eastern Ukraine // Journal of V.N. Karazin's National University. Series: biology. — 2008. — № 814, Iss. 7. — P. 65–73. (in Russian)

C. Bat rehabilitation records for science

Zukal, anna nele herdina

Annex 1. Questionnaire

IWG14 – Bat Rehabilitation: Questionnaire

Country	
Completed by	
Organisation	
Contact details	
Date	

Bat rehabilitation is temporary caring for bats which lost their roosts,or were injured or orphaned, folowing to release them back into the wild. ***Please, forward the questionnaire to responsible bat-rehabilitation workers in your country.***

* Circle what is applicable.

General

1) Who is rehabilitating bats in your country? Approximate number?

a) Persons	Y/N*	n =
b) NGOs	Y/N*	n =
c) Governmental organizations	Y/N*	n =
d) Others	Y/N*	n =
e) Nobody	Y/N*	

If others, please, specify:

_____

2) Who is funding bat rehabilitation in your country?

a) Governmental bodies	Y/N*
b) Local authorities	Y/N*
c) NGOs / funds	Y/N*
d) Private contributors	Y/N*
e) Others	Y/N*
e) Nobody	Y/N*

If others, please, specify:

_____

3) Are there any regulations for bat rehabilitation in your country? Y/N*

If yes, please, give detailes:

_____

4) Do bat rehabilitation centres (or people) in your country co-operate with each other? Y/N*

If yes,

a) Bat rehabilitation centres (or people) co-operate closely	X*
b) Bat rehabilitation centres (or people) co-operate more or less	X*

c)	Only some bat rehabilitation centres (or people) co-operate	X*
d)	Bat rehabilitation centres (or people) don't co-operate	X*

5) **Are there summarizing descriptions of bat rehabilitation systems in your country? Y/N***

If yes, please give references to the summarizing publications:
_____

6) Are there databases for bat rehabilitation records available? Y/N*

If yes,

a)	All bat rehabilitation records are inserted in a national database	X
b)	Each rehabilitation centre (or person) has its own database, available for sharing	X
c)	Each rehabilitation centre (or person) has its own database, but they do not share data	X
d)	Only a few rehabilitation centres (or persons) record received bats	X
e)	Others	X

If others, please, specify: _____

Rehabilitation for conservation of bat populations and their roosts

7) **Can you estimate the number of received and released rehabilitated bats per year in your country? Y/N***

If yes, please, give approximate numbers: _____

If available, please, give references to the summarizing publications: _____

8) What species are mostly rehabilitated? In what numbers (per year)?

a)	*Nyctalus noctula*	1–10 / 10–100 / 100–1000/ >1000 ind.*
b)	*Vespertilio murinus*	1–10 / 10–100 / 100–1000/ >1000 ind.*
c)	*Pipistrellus pipistrellus*	1–10 / 10–100 / 100–1000/ >1000 ind.*
d)	*Pipistrellus pygmaeus*	1–10 / 10–100 / 100–1000/ >1000 ind.*
e)	*Pipistrellus nathusii*	1–10 / 10–100 / 100–1000/ >1000 ind.*
f)	*Eptesicus serotinus*	1–10 / 10–100 / 100–1000/ >1000 ind.*
g)	Others	1–10 / 10–100 / 100–1000/ >1000 ind.*

If others, please, specify: _____

If available, please, give references to the summarizing publications: _____

9) Which bats are mostly rehabilitated (choose max 4 points)?

a)	Extracted during renovation works in buildings	X*
b)	Single bats in rooms	X*
c)	Seasonal mass invasions of tens/hundreds of bats in rooms	X*
d)	Caught by cats/dogs	X*
e)	Grounded adult specimens	X*

f)	Found in felled trees	X*
g)	Orphaned juveniles	X*
h)	Others	X*

If others, please, specify: _____

10) Are bat rehabilitation records used to rescue / monitor colonies or to prevent demolishing of roosts during renovation and insulation works?

Y/N*

Rehab data and rehab bats for scientific purposes

11) Are bat rehabilitation records used for collecting additional faunistic data (new localities, occurrence of species, etc, etc,)?

Y/N*

If published, please give references:

_____

12) Are dead animals used for virological, morphological, parasitological, histological etc. research? Or for museum collections?

Y/N*

If yes,

a)	All died bats are stored in a freezer for further research* / museums*	X*
b)	Dead bat bodies are occsionally utilised	X*
c)	Others	X*

If others, please, specify:

_____

13) Do you have national regulations concerning the use of dead animals for different purposes?

Y/N*

If yes, please, specify:

_____

Rehabilitated bats for public education

14) Are bats under rehabiltation used for public education during bat events in your country?

Y/N*

15) Are healthy wild bats used for public education during bat events in your country? Y/N*

16) Are there any regulations and restrictions for using (rehabiliated) bats during bat events in your country?

Y/N*

If yes, please, specify:

_____

If available, please, give references to the summarizing publications:

_____

17) What bat species are used during bat events?

Please, specify:

_____

18) During bat events, in your country, visitors can:

a) See bats in hands of bat-workers	X*
b) See bats only in a box	X*
c) Touch bats by hands in gloves	X*
d) Touch bats by hands without gloves	X*

19) Who is authorized in your country to euthanize bats of which their clinical situation avoids further successful rehabilitation?

Please, specify: _____

Rehabilitation itself: exchange of experience

20) Do you have any manuals or guidelines in your country in national language(s)?

Y/N*

If yes, please, give reference, if possible with an on-line link.

_____

21) Please point few names and contacts of experts involved in bat rehabilitation in your country.

Name	Country	City	Organisation	E-mail

22) Please give references to main bat rehabilitation web-sites, if available:

_____

Other

23) Rabies vaccination is compulsory for all people who works with bats in animal rescue centers
Y/N*

Annex 2. EUROBATS Resolution 7.10 Bat Rescue and Rehabilitation

The Meeting of the Parties to the Agreement on the Conservation of Populations of European Bats (hereafter "the Agreement"),
Recalling Article III of the Agreement, especially paragraphs 1, 2, 4 and 5;
Noting that bat rescue and rehabilitation involves rescuing bats and bat colonies at risk and temporarily caring for bats which have lost their roosts, or those which are diseased, injured or orphaned; then every effort is made to release them back into the wild;
Further noting Resolution 5.2 on Bats Rabies in Europe that recommends rabies surveillance of bats which have died or injured bats which have been euthanized;
Further noting Resolution 5.4 on Monitoring Bats across Europe for the further collection of faunistic data;
Further noting Resolution 5.7 on Guidelines for the Protection of Overground Roosts, with particular reference to roosts in buildings of cultural heritage importance since most bats received by bat rehabilitators are found in or nearby buildings;
Further noting Resolution 6.5 on Guidelines on Ethics for Research and Field Work Practices;
Further noting Resolution 6.8 on Monitoring of Daily and Seasonal Movements of Bats;
Further noting Resolution 6.16 on Implementation of the Conservation and Management plan 2011-2014 that parties should continue efforts to raise public awareness to improve education;
Further noting Resolution 7.11 on Bats and Building Insulation which recommends the collection and sharing of information on bat presence in buildings;
Recognising that Bat rescue and rehabilitation may play an important role in bat conservation;
Further recognising that relevant information obtained from bat rehabilitators can be used for practical bat conservation including roosts;
Further recognising that data collected by bat rehabilitators can provide important information for scientific research such as species distribution and disease monitoring as well as for practical conservation;
Further recognising that the level of bat rehabilitation varies across Parties and Non-Party Range states ranging from countries with no rehabilitators to those with established operating networks;
Further recognising that the recording protocols are not standardised and differ widely across Parties and Non-Party Range states;
Further recognising that public awareness is important for effective bat conservation;

Urges Parties and non-party Range States to:
1. Encourage the establishment and support of effective animal rescue and rehabilitation systems which include bats in their countries;
2. Encourage capacity building and training in order to raise the standards of bat rescue and rehabilitation;
3. Recommend the use of standardised record protocols (Annex 1) by bat rehabilitators and encourage the contribution of data to any existing national database, or if absent, encourage the establishment of such a database;
4. Encourage collaboration between bat rehabilitators and bat scientists for the purposes of data collection, other scientific research and exchange of knowledge;
5. Use only captive disabled bats for public events when national legislation permits it;

Requests the Advisory Committee to develop guidelines for bat rehabilitators and develop a system for collecting information for international cooperation.

Annex for Resolution 7.10

A standard form of bat record protocol applicable for bat conservation should include at least these items:

ID number

Name of finder: C

Name of rehabilitator/organization:

Date of finding:

Location of finding (address if appropriate):

Place of finding: ground bu ng block-of ts facade cellar

tree unknown other

Circumstances of finding: reconstruction in tion fallen tr

brough by cat dog unknown

other

Bite incidents human cat other

Species:

Sex: male fe e **Age:** no plant baby juvenile adult

Individual/colony: Individual Colo Size of colo

Condition of bat: normal s e dehydratation exhaust nd emmaciated

injured dead other

Sent for disease test: Yes No

Final fate: Released Euthanas Captivity Death

Comments:

We also recommend to take photographic documentation if possible.