

Photo: Krzysztof Gajda - Greater mouse-eared (*Myotis myotis*)



Nature Conservation underground

Visiting greater mouse-eared bats and others

The heavy steel door just doesn't want to budge. Norbert Bartel curses. "It jams every time!" I lend a hand, we rattle the door hard and give a combined shove, and finally it gives, opening the way to hundreds of bats, mostly greater mouse-eared (*myotis myotis*) but also other species too.

With a surface area of a mere 0.25 hectares, the building of the former Ostquell brewery in the middle of Frankfurt on Oder is Brandenburg's smallest nature reserve, and yet its significance is enormous. The old brewery was acquired by EuroNatur in 2003 and is looked after by our partner on the ground, the Landscape Conservation Association of the Middle Oder. It is quite simply the most important hibernation roost for bats in Germany.

Equipped with head torches and powerful lights, the group, made up of German and Polish conservationists, moves carefully through the vaulted cellars, where beer was once stored. It is dark, cool and damp, and in several places water drips off the walls. Over the decades, small stalactites have formed. I feel I could almost be in a limestone cave.

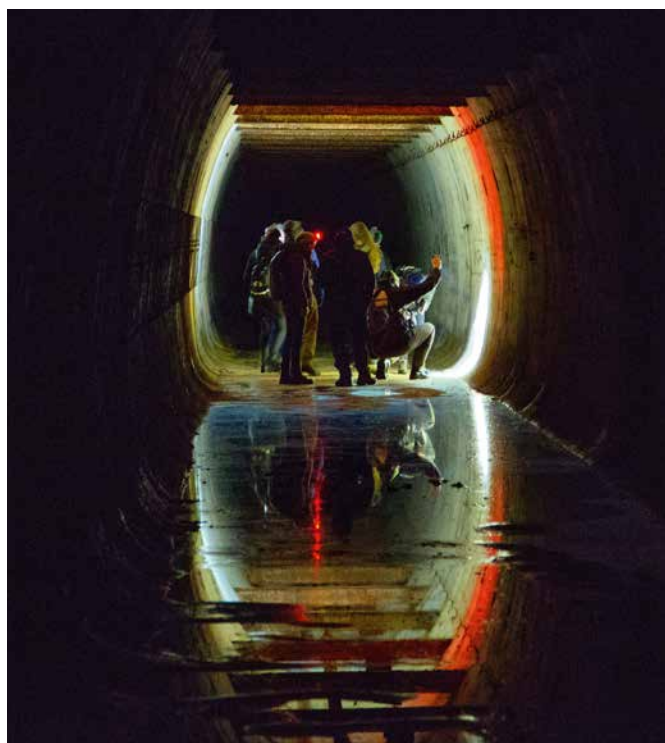


Photo: Tunnel in the bunker of Mieroperek

A ruin close to collapse

Suddenly Norbert Bartel, a bat specialist from the State Office for the Environment in Brandenburg, points his torch at the ceiling. We see our first cluster of greater mouse-eared, about 50 individuals, sleeping all huddled up together. A crack in the ceiling provides ideal conditions for their hibernation, allowing them to hang head down, hooked on firmly by their pointed claws. The thick, greyish-white fur on their stomachs gives them the appearance of a cuddly toy animal. The long broad ears of the species are unmistakable. It is fascinating to be able to observe the animals from such close quarters; usually you just catch a glimpse of a barely identifiable silhouette in the twilight.

It is important not to shine the torches on the cluster of mouse-eared for too long, and our bat expert, Norbert Bartel, suggests we move on in case the light and heat disturbs the bats' hibernation sleep. As our little group walks from one cellar vault to the next, our guide explains why each year there are so many bats in, of all places, an old brewery. "The microclimate in the ruined building is perfect, as there is a consistently cool temperature and it never freezes down here even if there are very low minus temperatures outside. The humidity in many places is over 90% and there is hardly any disturbance. You would almost think that the brewery had been built specially for the bats." We discover further clusters of mouse-eareds, as well as numerous, much smaller Daubenton's and Natterer's bats that have squeezed themselves into narrow cracks and crevices, or hang singly on the walls. Both these latter two species are less sociable than *Myotis myotis*.

When I saw the old brewery from outside, I could scarcely believe that over 1200 bats spend the winter here in this rather uninviting 'bat hotel'. Bushes and trees grow out of the ruin and in places the roof has collapsed. The premises are fenced off like a building site, which is indeed what it is, as since 2018, the summers, when the bats have left their roost site, have been filled with the noise of hammering, sawing and welding. "The building must be saved from collapse. Otherwise the bats will lose their hibernation site in the near future," said Sandra Wigger, the EuroNatur project leader for bat conservation.

In the upper storey of the brewery, where last year part of the roof was renovated and new supporting beams were fitted, Norbert Bartel again emphasises to us the importance of this outwardly so unattractive building. "Europe's bats are under tremendous pressure because of the lack of food, destruction of habitats and loss of winter roosts. The preservation of the brewery is therefore of immense significance for the future of the greater mouse-eared bat and its cospecies.

In Europe's biggest bat roost

The following day, it's off to western Poland. In the carpark of the visitor centre in Pniewo, we are greeted by a Russian T34 tank, surrounded by mighty howitzers. We walk past the tank traps, across fields full of larks singing in the air above, and reach the bunker, only made visible by the turrets and entrance door sticking out above the ground. The bunker complex of Nietoperek, about 80 kilometres east of the River Oder, is the biggest man-made winter roost for bats in the whole of Europe. Each autumn, over 35,000 bats from over 200 square kilometres come here to spend the cold period of the year in the bunkers.

Robert Jurga, an architect from Cracow specialising in military history, relates the history of the bunker complex (see text box). Toilets and camp beds are still there in the original, and some weapon systems, which the Soviets never took away after the Second World War, just sit there slowly rusting away. A Daubenton's bat has made itself comfortable in a big flame thrower – at last a meaningful use for this appalling weapon. The majority of the small mammals that spend winter 40 metres under the earth are to be found in the sector of the complex which is not accessible to the public.

Adventurous descent

135 steps take us down under the ground. Then we walk through the former soldiers' quarters and through the storage rooms for munitions. Finally, through a gate, we enter the Nietoperek bat reserve. The only people to have access to this area are the scientists who carry out surveys approximately every two weeks throughout the winter. We continue on our way, following the track of the narrow gauge railway, which used to link together the individual sections of this gigantic bunker network. We have to be very careful not to fall into the holes in the ground, some of which are up to four metres deep. There is no light here and if our torches went out, we would be standing in complete darkness.

After the first kilometre it begins to get progressively damper, and thus much more to the liking of the bats. Anna Bator-Kocoł, a biology student doing her PhD at the University of Zielona Góra, draws our attention to the first cluster of greater mouse-eared bats. Around 150 individuals have snuggled together at this point to spend the coldest part of the year. The range of species is similar to the old brewery in Frankfurt, principally clusters of greater mouse-eared with mainly Natterer's and Daubenton's bats squeezing into the cracks and crevices. These are all species which do not spend the winter in hollow trees or in warmer, more southerly climates, but which seek out underground chambers, whether natural or man-made.



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Photo: Greater mouse-eared (Myotis myotis)



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Photo: Krzysztof Gajda - Daubenton's bats (Myotis daubentonii)

- 1 A breath of Transylvania in the middle of Frankfurt: On approaching the old brewery, you could almost imagine yourself in front of Count Dracula's castle.
- 2 Norbert Bartel (3rd from right) tells the group about the progress in the renovation of the ruined building.
- 3 Bats instead of beer barrels: Alcohol is no longer stored in the vaulted cellars of the former Ostquell brewery, and a thousand and more bats have been made their home here.
- 4 The entrance to one of the biggest fortifications in Europe, the Oder-Warthe line or East Wall.
- 5 Most of the bunker system was buried deep in the ground to protect it from enemy fire.
- 6 No social distancing here! For the greater mouse-eared bat this is the time to all snuggle down together.
- 7 Even the much smaller Daubenton's bats appreciate body contact at this coldest time of the year, but prefer smaller groups.



Anna Bator-Kocoł carefully dries the fur of the fallen bat. It was presumably from this cluster of greater mouse-eared bats (righthand picture) that the exhausted bat fell.



Dangers in the winter roost

Suddenly there is a murmur of excitement. One of the party has discovered a bat lying on the ground. The Polish biologists rush over immediately and shine their torches at the ceiling above the unfortunate bat. There above is a cluster of mouse-eared. "It's not unusual for individual bats to fall off," says Anna Bator-Kocoł, whilst she carefully picks up the animal off the ground with a piece of kitchen roll. "If the paint or the plaster on the wall becomes loose, the bats lose their grip and plunge to the floor. Sometimes, when a bat in the cluster wakes up, there are little tiffs within the group and this can end up with one of the bats falling down." Bats are however robustly built, and they can usually survive a fall of several metres. "Ideally the animal will scabble back up the wall and become torpid again. It is more serious if they fall in a puddle. The cold water prevents them from waking up properly and they can drown or die of hypothermia," she adds. She carefully dries the bat's fur and hangs it back up on the wall; the locking mechanism in its tiny claws immediately grips onto the ceiling. It is impossible to tell, though, whether the mouse-eared bat will survive.

As we walk through the underground corridors, again and again we catch sight of single bats fluttering around in the light of our torches. The winter in western Poland has been unusually mild, and many bats are waking up now, at the end of February, much earlier than usual. But there is still too little food for these insect-eaters, and this can prove fatal for many of them. Anna Bator-Kocoł draws our attention to another phenomenon of climate change, namely that the bunker is losing its humidity. The last two summer have been extremely dry and even the winters have not had sufficient rain. The water table is sinking and less and less water is penetrating in from underneath. That makes the bunkers less attractive to the bats. Since they do not take in any water or food during their hibernation, the bats are reliant on high air humidity. If this is lacking over the winter, they will dry out and die.

When we find a half-eaten bat on the ground, Marcin Bochenski, a biologist with our partner organisation Liga Ochrony Przyrody, tells us about the other dangers present in these tunnels. Martens and raccoons regularly come into the tunnels and prey on the bats which have fallen to the ground or are hanging within easy reach of these predators. There are also other undesirable guests, such as enthusiasts of military history who break into the tunnels in search of historic remnants from the Nazi era, as well as people, mainly young, who want to spend a night in the bunker as a test of their courage. These troublemakers not only leave rubbish behind, but also make a lot of noise and often light fires which may quickly lead to carbon dioxide poisoning. Bats in hibernation reduce their body function to a minimum during hibernation, so a premature awakening will cause the bats to expend a considerable amount of energy, and this may lead to their death. "We are trying to block up all potential entrances holes," says Marcin Bochenski, but he also emphasises that this is difficult in practice because of the enormous size of the one-time bunker complex. The securing of the entrances is just one of the many tasks which the Polish bat conservationists will be carrying out in the next few years to improve conditions for the animals in what is surely one of the most unusual of European bat roosts.



Christian Stielow



Warmth-loving animals that live in close proximity to people.

With a head and body length of 7–8 cms and a wing span of up to 43 cms, the greater mouse-eared bat (*myotis myotis*) is the largest species of bat in Germany. In central and southern Europe, as well as the Middle East, it is very widespread. The greater mouse-eared is a prime example of a synanthropic species, one which lives in a close relationship with human beings. The nursery roosts, in which the females bring up their young, are often to be found in attics, whilst the winter roosts are in mine adits, bunkers and cellars. Thanks to these "ersatz caves", the warmth-loving mouse-eareds have succeeded in expanding their range into the northern parts of central Europe. Despite their relatively large populations, *myotis myotis*, like all bats, is endangered by the sharp drop in insect numbers and by the renovation of old buildings which does not take account of the bats' needs. Because of Corona virus, bats have probably lost some of their good reputation. It must be stressed, however, that the species indigenous to Europe have proven not to carry the virus (more on page 28).



The line of fortifications along the Oder-Warthe

The construction of the bunker system known as the East Wall was begun in 1934. It was designed to protect the then eastern border of Germany from an attack by Poland. The complex stretches in a north-south direction over a length of more than 30 kilometres and includes 60 bunkers and other buildings, which in the central part are linked together by an eight-kilometre long communication route. Before its completion, however, building work was stopped in 1938; the Nazis no longer required a defensive bunker system, because they were now planning an offensive war against Poland. The Oder-Warthe line was of no further significance to the course of the war. Today a part of the bunker system can be visited at the village of Pniewo.

Nature conservation in the German-Polish border zone

The measures for protecting bats in Frankfurt on Oder and Nietoperek are part of the INTERREG project "Natura Viadrina+". The aim of this project, which began in January 2018, is the stabilisation and improvement of the habitats of endangered species on both sides of the Oder. This extends well beyond the protection of bats. The cross-border project also, for example, includes white storks, European fire-bellied toads and smooth snakes. A further component is the reinforcement and intensification of cross-border cooperation between conservationists in Poland and Germany.

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