## **UNEP-Eurobats**

A Study Guide by Rasmus Conrad and Moritz Adam, ZuMUN 2022

## Topics:

- 1. The Effects of Urbanisation and Infrastructure Development on the Habitat of European Bats
- 2. Creating Structures for the Conservation and Care for Endangered Bat Species in Europe



# 1. Personal Introductions

## Dear Delegates of EUROBATS,

My name is Rasmus Conrad, I'm 21 years old and currently studying Business Administration and Civil Engineering at the TU Braunschweig. It is my honour to chair this extraordinary Committee together with Moritz. This will be my fourteenth MUN in general, the seventh time chairing but the first time on university level. Apart from MUN, I love to do sports, play the clarinet and the tenor saxophone and of course meeting with friends.

I'm really looking forward to this year's conference and hope we'll meet in person in April!

P.S. I still have to watch Batman for preparation.

Dear delegates,

my name is Moritz Adam, and it is my great pleasure to chair the UNEP-Eurobats committee at this year's ZuMUN conference together with Rasmus. I am very excited about this topic, which I have wanted to do at an MUN conference for a long time. Currently, I am a doctoral candidate, writing my doctoral dissertation in Classical Hebrew Literature and Ancient Jewish Studies at the Faculty of Theology of the University of Zurich. ZuMUN will be my eighteenth MUN conference, which makes me feel terribly old and somewhat boring for doing the same thing for such a long time. I also quite enjoy reading novels and poetry, at the moment my main interest is in Russian literature, albeit only in translation for now, and since I have moved to Switzerland, I have discovered the Swiss Alps as a wonderful destination to go hiking.

I look forward to welcoming you to Zurich in April, and to meet all of you in person then!



## 2. How to Use this Guide

This study guide serves the purpose to introduce the general directions of the topics chosen for the committee, and to present some avenues along which delegates may wish to proceed in the preparation. It is not a comprehensive treatise, and the consultation of the study guide alone does not suffice as preparation for ZuMUN. The purpose of this guide - as its name suggests - is to guide you whilst you undertake research on the two topics of the UNEP-Eurobats committee, and to give you directions on your way.

Please take the following advice to heart and proceed accordingly in your preparation:

- Begin your research in time and do not wait until the last minute when reading up on the topics and preparing your position paper. Understanding the topics of the debate and their complexity well is essential for you to be able to participate actively in the debate and to write meaningful and innovative draft resolutions with your fellow delegates.
- Remember to use a variety of sources for your research. While your position paper needs not the same amount of referencing as an essay for submission in your university degree, of course, it is necessary and helpful to consult a range of literature in order for you to gain a broad and nuanced impression of your role in the debate. If possible, please try to consult sources published in or by the country which you have been assigned, in order to be as specific and accurate as possible in representing this country at ZuMUN. Ideally, try to consult some sources which provide you with a general overview on the topics for debate as well as other ones which help you understand your country's specific policies on these matters.
- In the process of this preparatory research, it is often not necessary to start completely from scratch when thinking about what kinds of ideas you might want to introduce to the debate as a delegate of your assigned country. You may wish to look up whether your country has recently passed laws or whether there might exist organisations, committees or the like on the topic at hand, and what kinds of approaches they have taken in the past. Building on this, you should think further and develop further ideas as to how the issues at hand could be tackled in line with your country's previous policies.
- When articulating proposals in your position paper, as well as later in working papers and draft resolutions, do remember to be realistic whilst being innovative. While MUN gives you room to be imaginative and innovative, try to remain within reasonable boundaries.
- Please bear in mind that your role in the debate is to represent specifically the views of the country that you have been assigned, and to work towards resolutions which reflect its policies. It is imperative for the format of MUN debating to work that you stick to this role at all times. This might be quite easy or rather difficult for you, depending on whether your own views align with those of your assigned country. But even if you are asked to participate in a debate where you need to take a position that might not be your own, this can be a great opportunity to think about points that you might not necessarily consider otherwise, and perhaps to add more nuance to your political opinions. In this sense, MUN is a great exercise in pluralistic thinking.



# 3. Introduction to the Committee

## EUROBATS

This committee is perhaps somewhat different to most that are simulated in the context of Model United Nations. While most committees of the United Nations derive their affiliation from being one of the six principal organs of the UN, a part thereof, or a specialised agency, the

historical point from which the committee simulated here set out is an agreement, i.e. a document adopted by another UN body.

Subsequent to the Convention on the Conservation of Migratory Species of Wild Animals, also known as the Bonn Convention, coming into effect in 1983, it was decided at the third Meeting of the Parties, i.e. representatives of the countries that had ratified this convention, which took place in September 1991 to pass a further, more specialised convention entitled the "Agreement on the Conservation of Populations of European Bats", in short EUROBATS. This treaty, in turn, has by August 2021 been ratified by 38 of the 63 range states, i.e. the states in which there are currently populations of European bats.



Besides establishing general guidelines on the

conservation of bats, which will be outlined in the following and which constitute the basis of all further political efforts in relation to conservation policy on the subject of European bats, there were four bodies set up to coordinate the further efforts on this issue.

Firstly, there is a working body, called the Advisory Committee, which deals with current issues in relation to European bats from a scientific perspective and drafts material used for political implementation. Secondly, there is a standing committee, which oversees administrative matters. Thirdly, there is the Secretariat, which fulfils other coordinative and representative duties and is the public face of the agreement and its signatories. The most important and powerful body of Eurobats, which is simulated at the ZuMUN conference, is the Meeting of the Parties. The Meeting of the Parties is the body in which resolutions on the subjects of European bats are adopted, which can amend the original agreement, and which is the link to policy making on the national level. Currently, there are 38 voting members in this body, namely the countries which have ratified the EUROBATS agreement. Further representatives of range states participate in the Meeting of the Parties as observers, yet they do not hold voting rights. Any vote on substantial matters, i.e. amendments to the original agreement, passing of resolutions etc. requires a majority of two thirds of the votes cast, while abstentions are not counted in calculating the number of votes. There is a further stipulation that any votes on financial matters require a majority of three quarters of Parties present.<sup>1</sup>

<sup>&</sup>lt;sup>1</sup> Cf. Agreement on the Conservation of Populations of European Bats, Art. V.1

# **General Information: Bat Populations in Europe**



Bats occur in a wide range of habitats, such as forests, agricultural land, and even in cities on all continents except Antarctica. In the last 70 years bat populations have been in serious decline, especially in Western Europe, which was stopped to a certain degree by strict protection paired with investments in their conservation. But still almost half of the bat species found in Europe are assessed to be endangered (Very high risk of extinction in the wild), Vulnerable (High risk of extinction in the wild) or near threatened (Likely to become threatened in the near future) according to the IUCN Red list. Being highly sensitive to slight environmental changes due to their specialised way of living, bats are a good ecological indicator revealing habitat fragmentation, ecosystem stress or changing habitat use.<sup>2</sup>

According to EUROBATS data currently a total of 51 bat species occurs in the EUROBATS area (the list can be found at <u>8th Session of the Meeting of the Parties</u>), consisting of 43 species of the insectivorous *vespertilionid* family, 5 members of the insectivorous *rhinolophidae*, *taphozous nudiventris* of the insectivorous *emballonuridae*, *tadarida teniotis* of the insectivorous *molossidae*, and *rousettus aegyptiacus* of the *pteropodidae*, the only frugivorous (consuming mostly fruit but also leaves) bat species in the EUROBATS area. *Rousettus aegyptiacus* is also the only so-called megabat with a maximum length of 15 cm and a 60 cm wingspan, weighing up to 170 g. All the other occurring species are microbats with a body length between 3 and 14 cm, a wingspan up to 50 cm, weighing between 4 and 80 g. The most important difference between megabats and microbats is that microbats use echolocation, whereas megabats usually do not. Thus in summary, we only deal with insectivorous microbat species, apart from one frugivorous megabat species.

In general, the amount of different bat species increases the further south one moves in Europe. For example, Norway is inhabited by about 11 different species, whereas Germany

<sup>&</sup>lt;sup>2</sup> Cf. Action Plan for the Conservation of All Bat Species in the European Union 2018 – 2024 p. 4 ff.

is home to 24 and Greece even to 34 different bat species (all of these countries are of a similar size). This has some consequences concerning the effects of climate change on bats, discussed in Topic 2. But it also means that research and protection strategies in countries located in the south need to be more diverse and are usually more complex, since different bat species partly have huge differences in hibernating, behaviour, foraging, commuting and roosting. Generally, insectivorous bats hibernate during the winter, since there is almost no food available. In spring, bats start to build up reserves, explore new areas and roosting sites, while the embryos of females that mated in the previous autumn begin to develop. During summer, mostly in June and July, pregnant females give birth to a single baby (some species are able to produce twins sometimes) in maternity roosts gathered together with other females. After one month the young are able to fly and at the end of summer they are almost independent. In autumn, males start courting the females, as the maternity colonies split up into smaller groups. Mainly in caves there are social gatherings where up to a thousand bats interact and mate. Afterwards, the bats search for suitable hibernation sites, either individually or in groups of up to several thousand. Potential roosts are caves, mines, rock crevices, buildings, trees, bridges and tunnels. Bats forage mostly at night and eat flies, moths, beetles, other insects and spiders in areas close or up to 30 km away from their roost, depending on the species. The average life expectancy varies between two and five years, but some individuals are reported to live for up to 40 years. Since bats reach sexual maturity after around one year, it is crucial for them to reach an age of at least two years, so that the population remains stable. Apart from human activity and domestic cats, bats have no major predators. To monitor and protect bats it is important to understand that some species migrate over more than 1000km, which makes international cooperation crucial. As it is quite difficult to study night-active migratory species, there is still a lot of research to do, to fully understand the migration of bats<sup>3</sup>.

After consulting this brief overview of bats in EUROBATS range states, you should do more specific research on the bat populations in your respective country during your preparation for the conference.

<sup>&</sup>lt;sup>3</sup> Cf. Action Plan for the Conservation of All Bat Species in the European Union 2018 – 2024 p. 8 ff.

# Topic 1: The Effects of Urbanisation and Infrastructure Development on the Habitat of European Bats

# A. Introduction

Urbanisation is slowing down in Europe, but infrastructure development in certain areas is increasing. Especially railways and wind turbines are being built more and more. But also large roads, mainly in Eastern Europe are planned and being constructed. The resulting and already existing fragmentation of habitats endangers all bat species.

In general, there is a low bat diversity and a low relative abundance in urban areas compared to forested areas, since only certain species (e.g. P. Kuhlii) seem to have the ability to exploit the urban landscape and artificial illumination. The following graphic shows the frequency of threats listed in the IUCN assessments of bat species, where urbanisation ranks third highest, underlining the impact of urbanisation on bats.



Mainly domestic cats, cars, trains and wind turbines lead to unnatural bat fatalities which are a serious threat for their populations because bats are long lived, have low reproduction rates, and thus their population growth is quite slow. That makes it harder for them to recover from increasing casualties caused by humans, e.g. through urbanisation and infrastructure development. As urbanisation as well as infrastructure development are crucial for economic development, they are unavoidable trends. But with smart legislation and international collaboration there is a chance to minimise the negative effects on bats and thereby safeguarding the bat populations in the EUROBATS Member States.

<sup>&</sup>lt;sup>4</sup> Bats in the Anthropocene: Conservation of Bats in a Changing World p. 5

## **B.** Current challenges

The EU Bats Action Plan<sup>5</sup> lists several current threats and conservation issues. Important for this topic are the issues "Loss and disturbance of roosts", especially roosts in buildings, "Commuting and Foraging in Fragmented Landscapes", with special attention to light pollution and land fragmentation, and "Infrastructures and Mortality" concerning traffic infrastructure and wind energy deployment. In addition to these topics, we will discuss the effect of artificial water bodies on bats, which also are important infrastructure and at the same time an insect-rich habitat for bats. The following paragraph will address some main challenges, but for the debate it will be important for you to do some more specific research to make the resolution as diverse and helpful as possible.

## (a) Roosts in buildings and other infrastructure

Bats originally only used natural roosts like caves and cavities or cracks in trees, but with the loss of old trees and the urbanisation and huge infrastructure projects there are many manmade alternatives, such as tunnels, cellars, bunkers, bridges, castles, churches, houses, flats, stables, cowsheds, barns or artificial roost site built for bats. In general, bats in northern European countries rely more on roosts in buildings than bats in southern countries. A EUROBATS survey found that at least 33 bat species depend on castles, 32 on churches, buildings and houses, 27 on stables and 23 on bridges, which is a huge share of the 51 species living in the EUROBATS Member States. Their urine and droppings can damage the buildings, some human neighbours may be disturbed by noise, especially at night, and by the serious smell of bats, which is why some people might try to get rid of their bat neighbours. Due to their large naked wings, bats are highly sensitive to chemical sprays and timber treatment substances that are used for renovation are poisonous and dangerous for them. Also the insulation of existing buildings can be a huge problem for bat roosts, as they might be trapped inside the attic, in cavities under the roof, air ducts, etc., are disturbed or lose their roost in a potentially disadvantageous time of the year.<sup>6</sup>

<sup>&</sup>lt;sup>5</sup> Action Plan for the Conservation of All Bat Species in the European Union 2018 – 2024

<sup>&</sup>lt;sup>6</sup> Cf. Action Plan for the Conservation of All Bat Species in the European Union 2018 – 2024 p.34 ff.

#### Case study: Bats enclosed in their roost during insulation works, Czech Republic

Hundreds of dead bats were found by workers of Czech Bat Conservation Trust during the control of an insulated building in Lovosice in April 2011. Bats died because the under-roof cavities, where they roosted, was blocked off by a metal grill during insulation works on block of flats. The case was investigated by the Czech Environmental Inspectorate.



The bats also occur in fissures among panels and are threatened by isolation layers of polystyrene. These cases could be solved e.g. by installation of special bat boxes, which have openings in both front and back sides enabling bats to enter their original roost.

### (b) Roads and railways in rural areas

Road building obviously fragments habitat, destroys parts of it and also degrades the surrounding area through noise, light and chemical pollution. The occurring traffic further kills bats directly through collision, which in some cases can lead to a population decline. For some bat species roads may be barriers, because of the interruption of existing flight lines and because some species avoid lit areas. There is evidence that in consequence of the fragmentation bats have reduced access to crucial habitats, which causes lower reproduction rates. Furthermore, the barriers reduce the gene flow between populations causing inbreeding with negative impact on the bats fitness and resistance against disease. Very important to notice is that roads affect different species differently. Larger, fast flying bat species usually foraging in the open are less affected by roads than smaller, slower flying species foraging in woodland and near the ground. Obviously, there is a general rule concerning the size of the road and the occuring traffic: the bigger the road and the bigger the amount of traffic, the more severe is the negative impact on bats.<sup>8</sup> As the following map shows, there are quite substantial differences in Europe concerning the fragmentation of landscapes. Corresponding to the population density, especially Belgium, the Netherlands, Denmark, Germany, France, Poland and the Czech Republic are highly fragmented regions in Europe.

<sup>&</sup>lt;sup>7</sup> Action Plan for the Conservation of All Bat Species in the European Union 2018 – 2024 p.38

<sup>&</sup>lt;sup>8</sup> Cf. Bats in the Anthropocene: Conservation of Bats in a Changing World p. 35 ff.



## (c) Roads in urban areas / light pollution

In contrast to the generally observed trend of bat activity declining with increasing urbanisation, some studies like a case study from Greece found that this trend does not apply to all bat species. It highlights that streetlamps and other artificial lights emitting UV light (more present in highly urbanised areas) can have a positive effect for certain insectivorous bat species like *P. kuhlii*, since there are more insects assembled than usual.<sup>10</sup> Also the species *P. pipistrellus, P. pygmaeus, H. savii, Eptesicus spp., Plecotus spp.* and *Nyctalus spp.* seem to take advantage of insects around light sources (LEDs don't emit UV light, so there are less insects drawn to them). Problematic for bat safety are illuminated entrances to roosts, as it makes it much easier for their predators, mainly birds, especially owls, to hunt the bats. Further studies show that certain bat species were avoiding illuminated areas when being installed along preferred commuting routes (without any streets). The light intensity and whether there were LEDs or HPS lamps didn't make any significant difference for *R. hipposideros and Myotis spp.*, whose activity along those routes was significantly reduced. In general, open-space and edge foraging bats are most tolerant to artificial lighting. Slower and forest-dwelling bats need the cover of trees to be protected against birds, thus tend to avoid illuminated areas.<sup>11</sup>

## (d) Artificial water bodies

Water bodies in general have a very positive effect, especially on insectivorous bats, as they provide high insect prey availability and drinking water. Moreover, linear water bodies (natural, as well as artificial) also function as corridors facilitating bat movement between different parts of urban and peri-urban habitats, without any cars etc. endangering the bats<sup>12</sup>. Since bats drink on the wing by swooping over a water source, the size and accessibility decides whether a certain species can drink from a water body or not. Small and more manoeuvrable bats are

<sup>&</sup>lt;sup>9</sup> Action Plan for the Conservation of All Bat Species in the European Union 2018 – 2024 p. 45

<sup>&</sup>lt;sup>10</sup> Cf. Winners and losers in an urban bat community: a case study from southeastern Europe p. 4

<sup>&</sup>lt;sup>11</sup> Cf. Bats in the Anthropocene: Conservation of Bats in a Changing World p.198 ff.

<sup>&</sup>lt;sup>12</sup> Cf. Winners and losers in an urban bat community: a case study from southeastern Europe p. 5

consequently able to drink from smaller water pools, whereas larger, less manoeuvrable bats need a large water surface, thus species richness and general activity increases with the size of water pools. That is why artificial bodies of water especially in urban areas, but also drains beside roads and railways and of course remaining natural water bodies play a key role in bat protection. Important to notice is that the water quality also determines the health and survival of bats, which is yet another reason for stricter legislation concerning water quality and wastewater deployment. Bats are affected either directly by polluted water when they drink it or indirectly when feeding on insects. When insect larvae feed on microorganisms in polluted water, they concentrate the pollutants in their body transferring them to the bats when being eaten as adults. Most studies on polluted water and its effect on bats were pertaining to organochlorine insecticides, metals and polychlorinated biphenyls.<sup>13</sup>

## (e) Wind turbines

In 2000 all European States had combined approximately 13 MW wind energy installed, which increased to 219 MW in 2020 (+1700%)<sup>14</sup>. About 15% of all wind energy is produced offshore, whereas 85% is produced onshore<sup>15</sup>, which means that the majority of wind turbines are built in potential habitat of bats. Since wind energy is one of the most important renewable energy sources, it is highly likely that we will see a further increase in the construction of wind turbines in the next decades - even bigger than in the last two decades. That is why wind energy development is one of the biggest threats for bat populations, especially in the coming years and decades.

"Bats are killed by blunt force trauma or barotrauma and may also suffer from inner ear damage and other injuries not readily noticed by examining carcasses in the field."<sup>16</sup> Scientists argue that bats supposedly collide directly with wind turbines because of either direct attraction, as wind turbines may resemble roosts and the outer extremities of the blades are too fast to be detected by echolocating bats. Or indirectly by insects, which are attracted to the white or grey colour of wind turbines, security lights as well as acoustic effects<sup>17</sup>, on which bats feed.

In total 27 different bat species have been found as casualties beneath wind turbines in Europe until 2014 (there are 51 different bat species living in Europe). EUROBATS Members reported 6429 documented killed bats at turbines between 2003 and 2014. The average annual bat casualties per MW in European regions vary between 0 and 11, being especially high in forested areas like the Black forest region in Germany with an average of 10.5 bats killed per MW per year, whereas it ranged between 0.0 and 0.8 in Spain. More than 90% of all bats killed at wind turbines in Southern Europe were the common pipistrelle, Nathusius' pipistrelle, soprano pipistrelle (*Pipistrelluspygmaeus*), Kuhl's pipistrelle (*Pipistrellus kuhlii*), and Savi's pipistrelles (*Hypsugo savii*) and the common noctule, giant noctule (*Nyctalus leisleri*). Across Northern Europe the species common pipistrelle, common noctule (*Nyctalus noctula*), Nathusius' pipistrelle (*Pipistrellus nathusii*) and Leisler's bat (*Nyctalus leisleri*) were most commonly killed at wind turbines. Thus there are quite similar

<sup>&</sup>lt;sup>13</sup> Bats in the Anthropocene: Conservation of Bats in a Changing World p.215ff.

<sup>&</sup>lt;sup>14</sup> Cf. Europa in Zahlen | BWE eV (20.3.2022 20:23)

<sup>&</sup>lt;sup>15</sup> Cf. Europa - Offshore-Wind Industry (20.3.2022 20:34)

<sup>&</sup>lt;sup>16</sup> Bats in the Anthropocene: Conservation of Bats in a Changing World p.296

<sup>&</sup>lt;sup>17</sup> Cf. Guidelines for consideration of bats in wind farm projects - UNEP ... p.8

bat species endangered by wind turbines in Northern and Southern Europe.<sup>18</sup> Other studies estimate that for example in Germany presumably 250 000 bats are killed at wind turbines annually, which highlights the importance of mitigation measures at wind energy facilities. A quite successful measure is the raising of the cut-in speeds (the wind speed at which the generator is connected to the grid and producing electricity) by 1.5-3.0 m/s, which results in a reduction of bat fatalities of about 50% (with 1.5 m/s raise), when applied at day-/night-times with high bat activity.<sup>19</sup>

In summary, studies generally conclude that bats that regularly forage in less cluttered and more open air-space are most vulnerable to collisions with wind turbines, regardless of habitat, roost preferences and migratory patterns. Throughout Europe aerial-hawking and relatively fast-flying, open-air bat species were most often killed at wind turbines.<sup>20</sup>

C. Topics a Resolution could include

After gaining a basic overview in the guide, we now expect you to do your own, country-specific research. It can be helpful for you to find information on current legislation for infrastructure projects concerning bat protection, which bat species are endangered by urbanisation and infrastructure development in your country, what actions bat conservation organisations in your country call for and of course what position your countries government has regarding this topic.

The following questions can be seen as guidance to what you should aim to answer in your policy statement and draft resolution, but please feel free to include more ideas that you find suitable for tackling the problem:

- How can renovation and insulation activities be bat-roost compatible? Compensation? (artificial roosts?)
- How can we reduce the fragmentation of habitats? Protection areas, underpasses<sup>21</sup>?
- How can streetlamps be adapted to minimise their negative impact on some bat species and how can the positive effects of artificial lights be used in order to help bats?<sup>22</sup>
- How can bats be protected proactive against the background of the drastically increasing construction of wind turbines?<sup>23</sup>



<sup>&</sup>lt;sup>18</sup> Cf. Bats in the Anthropocene: Conservation of Bats in a Changing World p.300 f.

<sup>&</sup>lt;sup>19</sup> Cf. Action Plan for the Conservation of All Bat Species in the European Union 2018 – 2024 p.57

<sup>&</sup>lt;sup>20</sup> Cf. Bats in the Anthropocene: Conservation of Bats in a Changing World p.303

<sup>&</sup>lt;sup>21</sup> Cf. Bats in the Anthropocene: Conservation of Bats in a Changing World p.35

<sup>&</sup>lt;sup>22</sup> EUROBATS Guidelines for considerations of bats in lighting projects

<sup>&</sup>lt;sup>23</sup> Resolution 8.4 - Wind Turbines and Bat Populations

# Topic 2: Creating Structures for the Conservation and Care for Endangered Bat Species in Europe

## A. General Matters

In relation to studies pertaining to the subject of European bats, it is initially noteworthy that "[b]ats constitute one of the most diverse mammal groups in Europe."<sup>24</sup> Accordingly, any consideration of issues relating to conservation policy must account for geographical and climatic differences and peculiarities whilst attempting to resolve pressing problems.

For the purposes of this overview of significant issues that may be dealt with in the debate, should participants choose to do so, three distinct aspects shall be covered in the following. This serves not to provide a comprehensive account of all current matters of concern or to induce necessarily a concentration solely on the issues presented in this study guide, but rather to provide an insight into some important issues, which stand exemplarily for the range of directions into which research into this the wider topic of the committee might be taken, or perhaps to provide an exemplar for the direction into which delegates' preparation for the conference might be taken. The three issues are (a) the provision of facilities for rearing or care of endangered bat species in order to protect endangered species, (b) the impacts of climate change on European bat populations, and (c) the monitoring of populations for the purpose of determining where there are needs for human intervention into the natural ecosystem in the interest of the conservation of species.

- (a) Protecting Endangered Species
  - i. Introduction

The first issue at hand has been dealt with regularly in meetings of the members of UNEP-Eurobats, most recently in the 8th session of the so-called "Meeting of the Parties", which took place in October 2018 in Monaco. During this event, the resolution 8.8 "Guidelines for Bat Rescue and Rehabilitation" was adopted, which contains in an annex a draft for a compendium on this subject.

Besides providing an overview as to the countries in which there are currently facilities for the care for bats, and numbers for how many bats are being taken care of as well as which species are most frequently found in them, the document highlights a significant variation in relation to national legislation. It was reported that only 13 countries from among the range states in which there are habitats for European bats currently have national regulations in place regarding the rescue of and care for bats.<sup>25</sup> In five of these (Austria, the Czech Republic, Hungary, Ukraine, and the United

<sup>&</sup>lt;sup>24</sup> Rebelo et al., "Predicted impact of climate change on European bats in relation to their biogeographic patterns", *Global Change Biology* 16 (2010), p. 562

<sup>&</sup>lt;sup>25</sup> Eurobats MoP 8, Res. 8.8, p. 9

<sup>(</sup>https://www.eurobats.org/sites/default/files/documents/pdf/Meeting\_of\_Parties/MoP8.Resolution%208.8%20Guidelines%20on%20Bat%20Rescue%20and%20Rehabilitation.pdf)

Kingdom) there exists legislation specifically pertaining to bats. Usually the regulations cover restrictions as to which organisations or groups of people may handle found bats, which are in need of care, what qualifications are necessary for such activities, if and for how long they may be kept by individuals or organisations, as well as frameworks for live bats being used for events and presentations to the public. Moreover, the draft contains detailed guidance to the public on how to deal with the rescue of and care for bats with practical advice.

Besides such studies and guidance by Eurobats itself, which for the moment remain incomplete and are currently in the process of being finalised by Eurobats' advisory committee, there exist further regulations on the level of the European Union, which is accordingly binding for those parties of Eurobats that are also members of the EU. The most important international policy document on this subject is the EU's Habitats Directive (HD), which states as its main aim that "the preservation, protection and improvement of the quality of the environment, including the conservation of natural habitats and of wild fauna and flora, are an essential objective of general interest pursued by the Community, as stated in Article 130r of the Treaty [establishing the European Economic Community]".<sup>26</sup>

ii. Current Challenges

In a recent contribution on the issue of conservation policy, the European Commission published an action plan which sets out a number of issues in relation to which political action is called for.<sup>27</sup> Besides matters such as "Commuting and Foraging in Fragmented Landscapes" and "Infrastructures and Mortality", which are covered in topic 1, the report lists "Loss and Disturbance of Roosts", "Infectious Diseases", and "Misunderstandings and Myths [on the part of the public]" as key threats in conservation policy. More specifically, issues at hand include, but are not limited to, varying factors which hinder bats from inhabiting different natural or artificial structures (caves, buildings, bridges, etc.) that could be addressed in the development and maintenance of these spaces, the risk to bats' health - especially during hibernation - from viruses, bacteria, parasites, fungi, and attacks from cats,<sup>28</sup> as well as matters of political communication.

The report contains also a series of proposals for actions to be taken,<sup>29</sup> and specifically calls for further work to be undertaken within the framework of Eurobats.<sup>30</sup>

iii. Policies in Different Member States

<sup>&</sup>lt;sup>26</sup> Council Directive 92/43/EEC on the conservation of natural habitats of wild fauna and flora (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31992L0043)

<sup>&</sup>lt;sup>27</sup> Action Plan for the Conservation of All Bat Species in the European Union 2018 – 2024, October 2018

<sup>(</sup>https://ec.europa.eu/environment/nature/conservation/species/action\_plans/pdf/EU%20Bats%20Action%20Plan.pdf)

<sup>&</sup>lt;sup>28</sup> In the current public health situation it may be of interest to some that the issue of the transmission of the coronavirus Covid-19 from animals to humans does not relate to European bats specifically. While it is currently assumed that Covid-19 was initially transmitted from a Chinese bat to a human in the city of Wuhan in 2019, European Bats do not carry the virus.

<sup>(</sup>cf. https://fledermausschutz.ch/coronaviren-und-fledermaeuse)

<sup>&</sup>lt;sup>29</sup> EU Action Plan, pp. 65-72

<sup>&</sup>lt;sup>30</sup> Ibid., pp. 73f.

For the purpose of illustrating how current approaches to endangered species are being undertaken, two member states of EUROBATS shall be considered in greater detail in order to give insight into current policies which the debate in the committee may build upon.

In Germany, a substantial part of conservation efforts in relation to endangered bat species is coordinated through the national conservation NGO "Naturschutzbund Deutschland" (NABU). In implementing the Habitats Directive of the European Union, NABU has designated a substantial number of sites as nature reserves, so that bats can live and breed there without any uncontrolled outside disturbance. Some projects have already yielded great success, as, for instance, one particular mine in Rhineland-Palatinate is home to more than 50,000 bats hibernating there during the winter.<sup>31</sup> Comparison with other sites, however, shows that substantial attention must be paid to a thorough investigation in the process of designating sites as nature reserves in relation to relevant natural factors that are necessary for bats to survive the winter. A comparable site in the same German state, for instance, was only partially designated as a reserve with such areas that were particularly suitable for bats notably having been left out.<sup>32</sup> The question may accordingly be raised whether more thorough guidelines could be published, i.a. on which characteristics must be considered for a site to be protected as a roost for bats, perhaps by an international body such as Eurobats, so that the efforts in the member states could be coordinated and further international comparison, as well as collaboration could be achieved. A further important issue, albeit on an overall smaller level, is the involvement of civil society. While the handling of bats that were found in need of rearing is, for good reason, restricted in many member states to such individuals that are in some way qualified to do so, it is noteworthy that institutions such as NABU use their presence in the media to present cases where people are caring for bats, so as to encourage others to follow these examples.<sup>33</sup> In fact, the latter case helps to tackle two issues at the same time, namely dealing with conservation as such, whilst helping to raise awareness and tackle misconceptions on the part of the public at the same time.

Another example for conservation efforts, which takes shape slightly differently, is that of Switzerland. In addition to those aforementioned studies dealing with the issue of bat conservation policy on an international level, a report was published by the Swiss federal office for the environment in 2014, which expands in detail policy suggestions to be implemented by subordinate bodies.<sup>34</sup> These are separated by different types of landscapes, e.g. forests, agriculturally used land, bodies of water and subterranean areas. A central issue addressed here is the provision of corridors to connect different habitats which exhibit suitable conditions for bat habitation. The importance of not only

 <sup>&</sup>lt;sup>31</sup> https://www.nabu.de/natur-und-landschaft/aktionen-und-projekte/naturschaetze/19124.html
<sup>32</sup> Ibid.

<sup>&</sup>lt;sup>33</sup> Cf. for instance the adorable story of the tiny bat "Emil" and his foster father, a university student who would take Emil with him to his university lectures in a neck pouch, detailing a number of Emil's adventures. https://brandenburg.nabu.de/tiere-und-pflanzen/saeugetiere/fledermaeuse/11233.html <sup>34</sup> Cf. Federal Office for the Environment, Red List Chiroptera (bats),

https://www.bafu.admin.ch/dam/bafu/en/dokumente/biodiversitaet/uv-umwelt-

vollzug/rote\_liste\_fledermaeuse.pdf.download.pdf/red\_list\_chiropterabatssummary.pdf

increasing the size of populations but also bringing them in contact to mutually reproduce with one another will be discussed further in the following section.

A further issue that is raised by Swiss experts, which is yet in need of resolving, is that of light pollution. As bats usually prefer to hunt in areas that should be as dark as possible, even relatively small installations such as streetlights and illuminated footpaths can disturb their patterns of migrating. While the illumination of outside areas increases in evermore densely populated areas, it might be an interesting point to debate in which ways larger coherent areas unrestricted by boundaries caused by illumination could be established.

In addition there are a number of independent organisations which strive to aid the rearing of injured or abandoned bats. One of them is the "Stiftung Fledermausschutz Schweiz" in Zurich, a charity which offers guidance and instruction to the public in relation to dealing with bats and is active in public campaigning for conservation issues. In the context of ZuMUN 2022, an excursion is planned to visit this organisation in order to learn further about their work.

## (b) Climate Change

## i. Introduction

In 2021 a new and updated report was published by the Intergovernmental Panel on Climate Change (IPCC) on the developments of man-made climate change.<sup>35</sup> In its assessment of the state of global climate its summary of the situation was that "it is unequivocal that human influence has warmed the atmosphere, ocean and land. Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred."<sup>36</sup> The further particulars of the dimensions, causes, potential effects, and suggested political responses have been extensively covered in the media in recent months and years and need not be substantially repeated here.

In relation to the study of bats and political efforts towards species conservation, the developments of global warming are alarming especially insofar as most bats are either hibernating or migratory animals and adjust their metabolism to surrounding factors. In this context, one must observe that "[bats'] diversity comprises several biogeographic groups [...] with a widespread distribution in Europe, covering all the major biomes from the warmer Mediterranean to the colder Boreal and Alpine regions."<sup>37</sup> A study conducted by the University of Bristol and the Instituto de Ciências Agrárias de Vairão in Portugal has found that "of special concern are northern latitude species where climate change could eliminate suitable climatic conditions whichever future scenario is modelled. As for Temperate and Mediterranean bat species, their future seems to be more dependent on the modelled scenario."<sup>38</sup> Essentially the research suggests that there will be a substantial migration of bats to new locations which exhibit the

<sup>&</sup>lt;sup>35</sup> "Climate Change 2021. The Physical Science Basis"

<sup>(</sup>https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC\_AR6\_WGI\_Full\_Report.pdf) <sup>36</sup> Ibid., p. SPM-5

<sup>&</sup>lt;sup>37</sup> Rebelo et al., loc. cit., p. 562

<sup>&</sup>lt;sup>38</sup> Ibid., p. 571

climatic circumstances which previously existed at their original habitat. It is further argued that the rate at which global warming occurs is a central factor in any model concerning bat conservation in the sense that migration of species to more favourable habitats requires time. This is especially the case if the regions into which bat species would enter are geographically quite distinct from their current environment, while the prospects for individual species of bats vary depending on their respective ability to tolerate some variation in the environmental conditions of their habitat.<sup>39</sup> In addition, it is suggested that it might, regardless of the precise scenario in which global warming will manifest itself, be necessary to place particular emphasis on establishing as large a bat population as possible now, so as to avoid future risks of extinction or genetic degradation through inbreeding under less favourable circumstances than the present ones, so that sufficiently large groups of bats could migrate north when necessary. As the habitable environments for different species might not be as geographically connected as they are at the moment, an adequate genetic diversity must be accounted for, even if several groups of the same species migrate into different regions.

## ii. Current Challenges and Policies

As it is suggested in the relevant research that maintaining a large population of bats is essential for future conservation of species - while already many species are endangered today<sup>40</sup> - it will be an important task to provide ideal conditions for bats' reproduction. There are several ways in which this can be accomplished. A key option which is at the disposal of national as well as international policymaking is the designation of areas as nature reserves and other kinds of protected areas in which bats can live and reproduce without much disturbance. This can relate to areas in which there are currently significant populations of bats as well as those that might become important habitats in the future according to current projections in relation to climate change. Especially considerations on the latter require international collaboration, as they may rely on population monitoring in foreign countries from which bats could migrate should this be required in light of future unsuitability of their current habitats population MoP8 8.7, in which the following is called for:

"The Meeting of the Parties to the Agreement on the Conservation of Populations of European Bats [...] advises Parties and non-party Range States, if not already done so, to [...]

3. monitor changes in species migration, hibernation, reproductive and rangeshift patterns and consequent species interactions,

4. ensure habitat availability and connectivity for bats now and in the future by appropriate means of habitat protection, the establishment of ecological networks and adaptive habitat management,

5. ensure that climate change impact on bats is taken into account in land-use planning and impact assessment in future projects evaluation.

<sup>&</sup>lt;sup>39</sup> Ibid., p. 572

<sup>&</sup>lt;sup>40</sup> Currently there are 51 bat species which inhabit the area covered by Eurobats that are listed as vulnerable or near endangered species. Cf. IUCN. 2021. The IUCN Red List of Threatened Species. Version 2021-3.

While this general interest is already established in the communications of earlier resolutions of Eurobats, policy proposals discussing these general proposals in further detail remain scarce, and there remains need for an international coordination of efforts which are usually undertaken at the national level at the moment. It might be of interest for future debate to consider previous efforts to provide habitats for endangered species in areas to which they had only recently migrated, e.g. wolves in central Europe, and assess in which ways comparisons or distinctions might be in order for the conservation policy efforts at hand. Moreover, one may further consider whether and/or at what point it may be ethically and practically appropriate for human efforts to actively contribute to the reproduction of especially endangered bat species by means of science and technology. For reference, such efforts have recently been undertaken with certain species which are close to extinction, such as lynxes<sup>41</sup> or rhinoceroses,<sup>42</sup> for which there have been specific breeding programmes.

Lastly, it may be of interest to expand the monitoring of the effects of bats migrating into new regions beyond the measuring of populations. Comparable evidence from south-east Asia, where in some regions the effects of climate change are already more drastically visible than in most parts of Europe, shows that the movement of bat species in this part of the world had a direct impact on the spreading of infectious diseases that the local bat species carried. Amongst other infectious diseases, this included no less than 100 different coronaviruses, one of which was transmitted onto a human in a market in Wuhan, leading to the Covid-19 pandemic.<sup>43</sup> Accordingly, policy proposals must, besides reflecting immediately upon bats and their habitats, take further consequences of the movement of species into account. Comparable evidence for problematic consequences of species entering new habitats in Europe with detrimental consequences for their surroundings in recent years include the Chinese mitten crab and the nutria. Even though both of these species did not arrive in Europe as a result of natural migration, they stand as evidence for potential detrimental effects of invasive species for existing ecosystems.<sup>44</sup> It would accordingly be necessary for risk assessments to be compiled also for the case of potential future migrations of animals, including, in the case of the current subject, bats.

B. Topics a Resolution could include

Based on the outline of current issues in conservation and care policy in relation to European bats that was presented above, delegates may wish to address some or all of the following questions in their own preparation for the conference, as well as others that they find to be important for representing their assigned country's policies:

<sup>&</sup>lt;sup>41</sup> Cf. e.g. https://www.lynxexsitu.es/programa-en.php

<sup>&</sup>lt;sup>42</sup> Cf. e.g. https://www.youtube.com/watch?v=EqYI5I2bWWI

<sup>&</sup>lt;sup>43</sup> https://www.klimareporter.de/erdsystem/ein-klima-fuer-fledermaeuse

<sup>&</sup>lt;sup>44</sup> Cf. for responses in policy the EU regulation No 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species (https://eur-lex.europa.eu/legal-content/EN/TXT/PDE/2uri=CELEX:32014P11438from=EN)

content/EN/TXT/PDF/?uri=CELEX:32014R1143&from=EN)

- How can national legislation among signatories of EUROBATS as well as other range states be streamlined?
- Where is there potential for further frameworks for international collaboration?
- How and/or where should previous policy decisions of EUROBATS be amended or changed in light of recent developments in political, ecological, and climatic circumstances?<sup>45</sup> Where can we build upon previous efforts and how can their implementation be aided?
- How can conservation and care policy efforts undertaken by European countries in relation to other species inform policy making in relation to bats?
- How can the public be involved in creating awareness and support for policy efforts?
- How do efforts for the protection or enlargement of populations of bats relate to other political responses to changes in ecosystems because of species migration and climate change?

## C. Literature and Links

A lot of the relevant literature for this topic has been cited in the footnotes of this section of the study guide. Delegates may consult in their research firstly any publications by their assigned country's ministry for environmental affairs, domestic newspapers and journals, and the output of academic research that may be available on the internet. A substantial amount of information, moreover is provided on the EUROBATS website: www.eurobats.org. In addition, there are many NGOs devoted to the protection of bats, which also provide a range of material online. In attempts to search for more specific information, after having gained a first overview, it can be helpful to consider which specific kinds of bats live in a delegate's assigned country and then to search for more specific literature that deals specifically with these species. Should you have further questions about the subject or their preparation for the conference, please do not hesitate to write to the chairs.

Further Helpful Links on General Issues:

- Resolutions of the Meeting of Parties | UNEP/EUROBATS
- Stiftung Fledermausschutz
- Bats in the Anthropocene: Conservation of Bats in a Changing World
- Winners and losers in an urban bat community: a case study from southeastern Europe
- Action Plan for the Conservation of All Bat Species in the European Union 2018 2024

<sup>&</sup>lt;sup>45</sup> Note that all past output of working groups of EUROBATS is published on their website: https://www.eurobats.org/official\_documents/

