Prespa Project – Biodiversity Conservation in Transboundary Prespa

Bat conservation and monitoring activities in Macedonian and Albanian part of Prespa during 2021-2024

- Final report -

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1. Introduction

In general, Prespa region is known for its extraordinary biodiversity with high number of species in almost all plant and animal groups, including high number of endemic species. The area has also a highly diverse bat fauna with 27 bat species recorded, adding up to 60% of the total bat fauna of Europe.

In an effort to preserving favourable conservation status of bats and their habitats in transboundary Prespa, between 2011-2012, a series of conservation and protection actions and measures were identified and compiled into two important documents: (i) Status Survey and conservation Action Plan for the Bats of Prespa (Papadatou et al. 2011); and (ii) Status Survey and Conservation Action Plan for the Caves and Cave Bats of Prespa (Papadatou et al. 2012). Both documents are recommending the need to increase the knowledge and the capacities for bat research, and to better know the key roosts in order to manage them in accordance to national and international regulations.

In 2021, The Prespa Project - Biodiversity Conservation in Transboundary Prespa started with the aim to work simultaneously on a broad range of fronts, in order to strengthen the PrespaNet network, support the efforts of nature protection authorities and engage stakeholders, local communities especially younger generations, in conservation initiatives that bring stable, long-term benefits for all. The project facilitated climate change resilience through management and restoration of priority habitats, monitoring and applied conservation actions on endangered species, and active environmental education and communication.

One of the many project components was the bat conservation and monitoring in transboundary Prespa. In order to fill the gaps in the knowledge and contribute to better conservation of bats and their habitats in N. Macedonia and Albania, and in line with the recommendations of the prepared Action plans for bats and caves in transboundary Prespa region, following objectives were defined:

- Support a unified survey and monitoring protocol for underground habitats and forest dwelling species;
- Improve/raise capacities of PA staff with regards to monitoring of bats and their habitats;
- Improve knowledge on bats and their underground and forest habitats;
- Improve the protection and proper management of underground habitats;
- Raise awareness about the importance of conserving bats and their habitats.

This report summarizes the activities and the results from the three-year research and monitoring of bats done on the Macedonian and Albanian side of Prespa in the period 2021-2024. It gives an overview on the presence, distribution and population size of the bats, most important roosting sites, as well as the information on the seasonal use of caves by bats. In addition, it summarizes also the capacity building activities for bat research and monitoring for the project partners and park authorities, awareness rising activities and the application of concrete

conservation measures. The results and achievements of the monitoring and conservation activities are presented for each project objective separately.

2. Objectives, activities and achievements

2.1 Unified survey and monitoring protocols for underground habitats and forest-dwelling bats

First step towards the monitoring of bats in Prespa was to initiate establishment of a transboundary monitoring system and to prepare common and unified monitoring protocols.

In March 2021 were conducted several meetings between Albanian and Macedonian experts involved in the projects in order to discuss and coordinate the activities for preparation, presentation and testing the protocols. Following the initial discussion in March, first drafts of the unified transboundary monitoring protocols were produced at the beginning of April, and the final ones were finalised early May. These protocols (both for cave and forest-dwelling bats) are in line with national and international framework and recommendation. Latest best practices have been included, especially regarding the COVID-19 situation.

On 7th of May 2021, more than 40 participants from different organisations from all three countries attended the transboundary workshop organised both online and with physical presence at the PPNEA's office in Prespa (Fig. 1 and 2). During this workshop, the importance of bats for the ecosystems and humans were presented, as well as legal components of their conservation. Also, the history of bat research and conservation in the Prespa area was also illustrated as well as the activities to be implemented within the frame of the Prespa Project. Finally, an interactive session directly involving participants was organised with regard to the monitoring protocols. Participants provided their inputs on tools and methodologies to be implemented on site in order to monitor bat species.

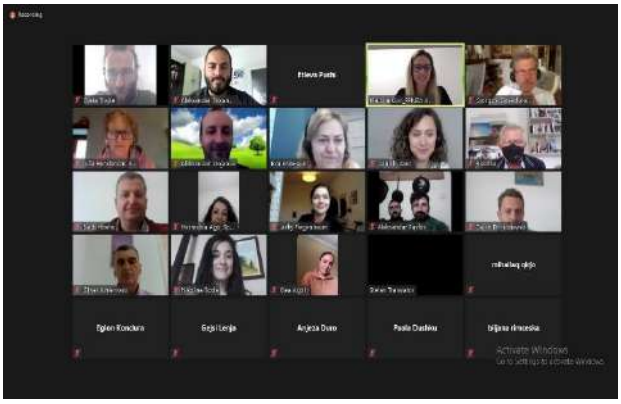

Fig. 1 and 2. Participants at the online workshop for the unified monitoring protocols

2.2 Improved capacities of PA staff for monitoring bats and their habitats

One of the recommendations from the existing Action plans for bats in Prespa was to increase the capacities in bat research and monitoring for the park employees, NGOs or other relevant stakeholders in both countries.

A three-day transboundary training was organized on 20-22 August 2021 in Oteshevo, Prespa. Seven persons (2 from MES, 1 - NP Galichica, 1 - NP Pelister, 2 students from Korcha University, 1 from RAPA) attended the training and got familiar with the *Chiroptera* animal order and the up-to-date research and monitoring methods. The training was led by Marina Radojnich, a bat expert from Montenegro, and consisted of theoretical and practical part (Fig. 3-6).

Fig. 3-6. Photos from the transboundary training in Prespa

At the theoretical part, there were lectures focused on the ecology, biology, behaviour of bat species, species diversity as well as on the most common methods used in bats research and monitoring. During the practical part, the participants got familiarized with the field equipment and get the basic advices about pre and post survey activities which should be applied during bat research actions. They got advices about survey safety, equipment needed for data collection and

they practiced the mist-net set up and use of bat detectors. At the field, mist-net were deployed so the participants had opportunity from the near to see the bat capture and the main characteristics of the *Chiroptera* order and some European bat families. Also, the participants had a chance to practice roost inspection in caves (a visit to Samotska Dupka cave was organized) and echolocation with hand-held bat detector along walked and car-driven transects.

Two volunteers from PPNEA had also an opportunity to practice the methods of echolocation and roost inspection during a joint field visit with MES personnel to Leskoechka Cave and Oteshevo on 26 May 2022.

Another, more targeted training, was organized on 06-08 October 2023 in Blagoevgrad, Bulgaria. Two representatives from Galichica NP and two from MES attended the training. It was led by Elena Stoeva-Tilova, a bat expert employed in the NGO Green Balkans, and was focused on the telemetry of bats, but also on other important research and monitoring methods (echolocation and capture). There was a theoretical part of the training with presentations for the status of bats, methods applied and experience with bat monitoring in Bulgaria, and field work with echolocation survey and bat capture (Fig. 7-10).

Fig. 7-10. Photos from the training in Blagoevgrad, Bulgaria

2.3 Improved knowledge on bats and their underground and forest habitats

Following the unified transboundary monitoring protocols, field surveys were organized in both countries in order to get data on presence and distribution of bats in Prespa, to see the seasonal use of the caves and assess the status of the underground sites. The field work was done in coordination and with involvement of the PA staff. Prior to the field work, the necessary equipment for bat research and monitoring was bought in both countries, including hand-held and static bat detectors, mist-nets, helmets, lamps and other small essential tools.

2.3.1 Cave-dwelling bats

N. Macedonia

Seasonal surveys to determinate the status of the bat population and the seasonal use by bats were done in the following caves in Galichica NP: Leskoechka, Samotska Dupka, Bimbilova, Mechkina Dupka, Crna Pesht, Naumova and Krstova caves (Fig. 11). The surveys were done in the period 2021-2023, using the method of roost inspection. Some caves were visited more than once in season, but in different months (Tab. 1). Mechkina Dupka, Naumova and Crna Pesht caves were not visited in summer season, and Bimbilova Cave was not visited in spring season. Three additional caves, Svinska Strna, Voila and Cherti Kamen, were inspected only during summer, whereas the newly discovered cave Klarova was visited in spring and summer season.

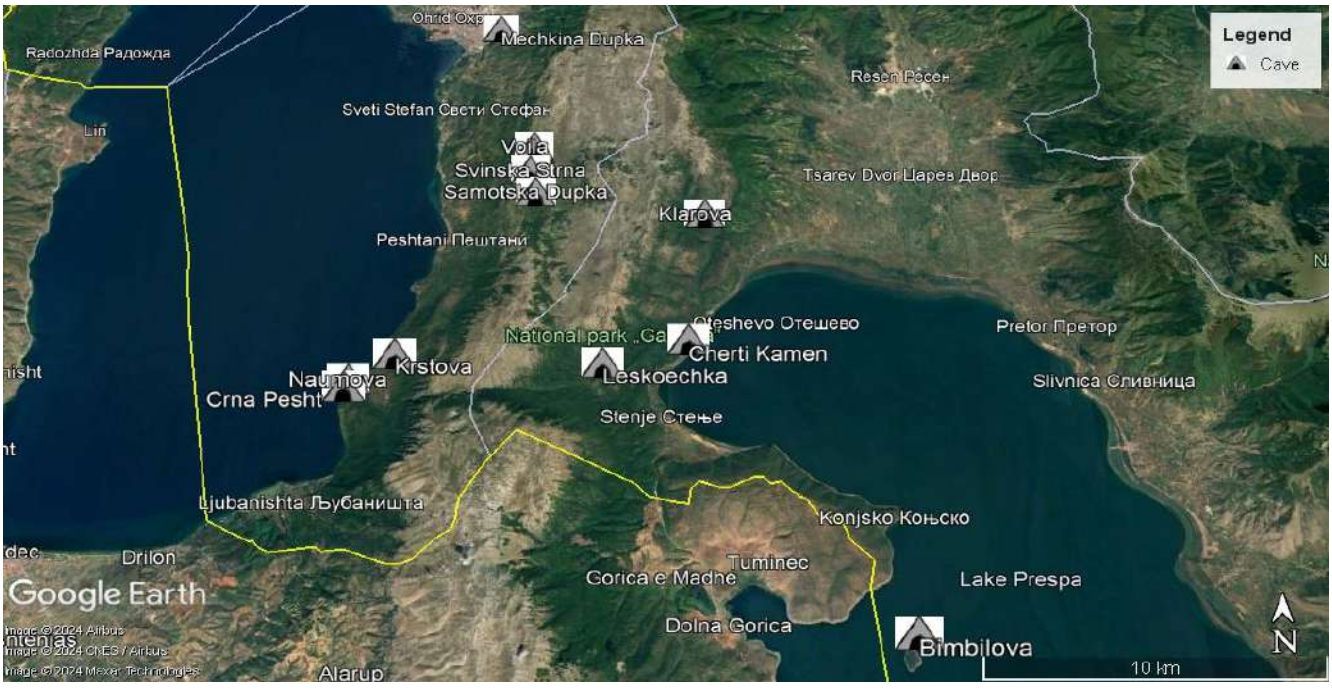

Fig. 11. Locations of the visited caves in Galichica NP

Table 1. Seasonal visits conducted in the caves in Galichica NP

Cave	Date of visit			
	Spring	Summer	Autumn	Winter
Samotska Dupka	05.06.2023	21.08.2021; 04.07.2023; 27.08.2023	20.10.2023	24.03.2023
Leskoechka	16.05.2023	27.07.2022	20.10.2023	02.12.2021; 28.02.2023
Bimbilova	/	29.08.2023	02.10.2021; 14.11.2023	28.02.2023
Krstova	18.04.2022; 14.05.2023	20.06.2023	01.11.2023	27.02.2023
Naumova	18.04.2022	/	01.11.2023	27.02.2023
Crna Pesht	18.04.2022	/	01.11.2023	27.02.2023
Mechkina Dupka	26.03.2022	/	28.09.2022	27.02.2023
Voila	/	15.06.2023	/	/
Svinska Strna		15.06.2023	/	/
Klarova	20.05.2023	26.08.2023	/	/
Cherti Kamen	/	21.08.2021	/	/

During the visits, we identified the bats present in the caves, counted the number of individuals and took photos of the specimens and the colonies. Additionally, for proper identification of the species, we captured individuals inside the caves and recorded bat call using Pettersson D240x and BatLogger M bat detectors. The analysis of the recorded calls was done using the computer software BatSound v.4.0.

Fig. 12. Roost inspection in Leskoechka Cave

During the seasonal surveys of the selected caves, we encountered presence of 7 bat species: *Rhinolophus ferrumequinum, Rhinolophus hipposideros, Rhinolophus euryale, Rhinolophus blasii, Myotis blythii, Myotis capaccinii* and *Miniopterus schreibersii*. The results of the seasonal surveys are summarized in Table 2.

Table 2. Species and number of individuals recorded per season in the caves in Galichica NP

Cave	Species	Spring	Summer	Autumn	Winter
Samotska Dupka	*Myotis blythii*	3	6	18	40
	Rhinolophus ferrumequinum	0	0	5	8
	Rhinolophus hipposideros	1	4	7	7
Leskoechka	*Rhinolophus ferrumequinum*	1	0	1	1
	Rhinolophus hipposideros	4	0	3	3
	Rhinolophus blasii	0	0	100[1]	0
	Rhinolophus euryale	0	2	100[1]	0
Bimbilova	*Rhinolophus ferrumequinum*	/	0	0	4
	Rhinolophus euryale	/	0	2	0
	Myotis capaccinii	/	0	>4000[2]	20
	Miniopterus schreibersii	/	2-3000	>4000[2]	2000
Krstova	*Rhinolophus ferrumequinum*	0	2	0	0
	Rhinolophus hipposideros	5	0	1	2
	Rhinolophus euryale	4	3	6	12
Naumova	*Rhinolophus ferrumequinum*	2	/	0	2
	Rhinolophus hipposideros	4	/	2	4
	Miniopterus schreibersii	5	/	10	0
Crna Pesht	*Rhinolophus hipposideros*	2	/	1	2
Mechkina Dupka	*Rhinolophus hipposideros*	4	/	4	3
	Rhinolophus blasii	0	/	0	2
Voila	*Rhinolophus euryale*	/	1	/	/
Svinska Strna	*Rhinolophus hipposideros*	/	2	/	/
Klarova	*Rhinolophus hipposideros*	~50	4	/	/
Cherti Kamen (small cave)	*Rhinolophus hipposideros*		1		

[1]Mixed colony of app. 100 individuals of *Rhinolophus blasii* and *Rhinolophus euryale*.
[2]Mixed colony of >4000 individuals of *Miniopterus schreibersii* and *Myotis capaccinii.*

The results showed that most of visited caves are important roosting sites for cave-dwelling bats, and their use by bats varies across the seasons, and even within one season.

Bimbilova cave hosts the largest colony with several thousand individuals of at least two bat species throughout the year (*Miniopterus schreibersii* and *Myotis capaccinii;* Fig. 13). It is also an important hibernacula for bats in Prespa region, and most probably as maternity roost. At least two bat species (*Myotis blythii* and *Rhinolophus hipposideros*) are present in Samotska Dupka cave throughout the year, but the highest number of individuals were registered in autumn and winter, suggesting that the cave is used in the swarming period and as hibernacula. In Leskoechka cave, bats are found throughout the year, but the highest number was recorded during autumn (mixed colony of minimum 100 individuals of *Rhinolophus euryale and Rhinolophus blasii*). This means that the cave is an important shelter for bats in autumn, when they mate and prepare to migrate to their hibernacula. In the recently discovered cave Klarova, a colony of about 50 individuals of *Rhinolophus hipposideros* was discovered during spring season, and this is the biggest colony of this species recorded on Macedonian side of Prespa so far. The cave might be used as hibernacula, however, this needs to be determined with further research.

Fig. 13. Mixed colony of Miniopterus schreibersii and Myotis capaccinii in Bimbilova cave

The other caves in Galichica hosts smaller bat populations throughout the year. There is a literature data that Naumova cave hosts mixed colony of few hundred individuals of 4 bat species (*Rhinolophus euryale*, *R. ferrumequinum*, *Miniopterus schreibersii* and *Myotis emarginatus*) in summer season (Boshamer et al. 2006; Papadotu et al. 2011). Thus, further research of the cave in summer season is needed to confirm this data.

Apart of the caves as important underground sites, we opportunistically inspected other artificial underground and overground roosting sites in Galichica and Pelister NP. The ones where bat species were recorded are presented in Table 3.

Table 3. Identified artificial roosting sites used by bats in the area of Galichica and Pelister NPs

No.	Site	Date of inspection	Species recorded
1	Abandoned hotel Evropa	15.05.2023	*Rhinolophus hipposideros (40 ind.), Rhinolophus ferrumequinum (min 100 ind.), Rhinolophus euryale (2 ind.), Myotis emarginatus (~50 ind.)*
2	Tunnel near hotel Lakeview	20.08.2021; 12.05.2023	*Plecotus auritus (1 ind.), Myotis emarginatus (1 ind.), Myotis mystacinus (2 ind.), Myotis myotis/blythii (1 ind.)*
3	Dry drainage pipe near Sirhan	16.05.2023	*Rhinolophus hipposideros (2 ind.)*
4	Barn in Shurlenci	21.08.2021	*Rhinolophus hipposideros (1 ind.)*
5	Objects near church St. Atanasij, area of St. Naum monastery	14.05.2023	*Rhinolophus hipposideros (6 ind.); Pipistrellus nathusii (1ind.)*
6	Abandoned barn above Brajchino	16.05.2023; 14.09.2023	*Rhinolophus hipposideros (20- 30 ind.)*
7	Church in Brajchino	16.05.2023	*No bats, but guano is present*
8	Bunker near Sirhan	15.09.2023	*Rhinolophus hipposideros (2 ind.)*
9	Children resort Pelister	24.08.2023	*Rhinolophus hipposideros (3 ind.), Rhinolophus ferrumequinum (2 ind.)*
10	Abandoned school in Pokrvenik	15.05.2023	*No bats, but guano is present*

It is important to mention that the abandoned hotel Evropa seems to be very important roosting site in summer season for at least four bat species: *Rhinolophus euryale*, *Rhinolophus ferrumequinum*, *Rhinolophus hipposideros* and *Myotis emarginatus.* Moreover, a large mixed maternity colony with about 50 individuals of *Myotis emarginatus* (Fig. 14) and minimum 100 individuals of *Rhinolophus ferrumequinum* was recorded inside the hotel, which is the first such colony of these species discovered on Macedonian side of Prespa.

Fig. 14. Colony of *Myotis emarginatus* at the abandoned hotel Evropa

Fig. 15. Individuals of *Rhinolophus hipposideros* in abandoned barn above v. Brajchino

Albania

Monitoring was conducted in every season: spring, summer, autumn and winter (2023-2024). A total of 33 locations are monitored during this period (Fig. 15).

Fig. 15. Bat monitoring locations in Albania

During the first expeditions in spring (22-24 May 2023), 24 locations were visited, including bunkers, abandoned buildings, caves, tunnels and bridges (Fig. 16). These sites were chosen as they had the highest probability of serving as roosting sites for bats. Throughout the rest of the year, monitoring was carried out using different methods. Mist netting was used during summer and autumn, while winter monitoring focused solely on identifying hibernation sites and counting the number of bats present.

Fig. 16. Different types of sites visited during the bat monitoring in Albania

Out of the 24 locations visited, bats were present in 7 of them. In addition to these, 10 sites showed previous bat presence, as evidenced by droppings and remains from feeding activities. A total of at least 4 species were identified during this expedition, including *Myotis capaccinii* and three species of *Rhinolophus: Rhinolophus euryale, Rhinolophus ferrumequinum, Rhinolophus hipposideros*, and an unidentified *Rhinolophus sp.*, which is most likely either *euryale* or *blasii*. This first expedition did not include mist netting. Instead, the sites were visually checked for bat presence and signs of their activity. In total, 833 bat individuals were counted during this expedition.

Fig. 17. Spring monitoring of bat fauna on Albanian side of Prespa

During the summer monitoring period (1-4 August 2023), a combined monitoring approach was employed to observe bat presence at 19 sites, which were (alongside with additional ones) also monitored during autumn and winter. The monitoring involved visually checking sites with confirmed bat presence/signs, as well as using mist nets in 4 of these locations. 6m and 3m mist nets were utilized for open spaces and caves, respectively. A total of 12 species were identified, with more than 3120 individuals counted, including 28 captured specimens.

Fig. 18. Roost inspection and bat capture in caves during summer season

The autumn expeditions were conducted from 30 October to 2 November 2023. This week is internationally known as “Bat Week”. A total of 20 sites were monitored during these expeditions. In three of the monitored sites, mist netting was used as a method for capturing bats. This involved setting up nets in areas where bats were known to fly, allowing us to safely catch and study them. In total six species were identified (*Rhinolophus hipposideros, Pipistrellus pipistrellus, Rhinolophus ferrumequinum, Myotis capaccinii, Miniopterus schreibersii and Rhinolophus sp.*) and a number of 156 individuals counted (of which 3 captured).

Fig. 19. Autumn monitoring of bat fauna on Albanian side of Prespa

On 9-11 January 2024, the winter hibernation count took place in 23 underground sites. In this period some bat species are hibernating so the locations were only visually checked. The following species (at least 5) were identified: *Rhinolophus hipposideros, Rhinolophus ferrumequinum, Rhinolophus euryale, Rhinolophus sp., and Myotis capaccinii*. 341 individuals were counted in 7 different hibernating sites.

Fig. 20. Inspection of hibernacula sites during winter on Albanian side of Prespa

2.3.2 Forest-dwelling bats

N. Macedonia

The research of the forest-dwelling bats was done in Galichica NP, Ezerani PA and Pelister NP in spring and summer season during 2021-2023, using bat detectors and mist-nets. Walked and car-driven echolocation transects were done along the main road from Sirhan to Stenje, road from Oteshevo to St. Naum monastery, the area of St. Naum monastery, near villages Leskoec, Asamati and Ezerani, road from Asamati to Brajchino, road to Malovishte and road from Trnovo to hotel Molika (Fig. 21). Moreover, passive bat detectors were set at 5 locations in Galichica NP and 4 locations in Pelister NP (Fig. 21). Mist-netting was done in forested areas above v. Brajchino, near v. Leskoec and in Oteshevo (Fig. 21).

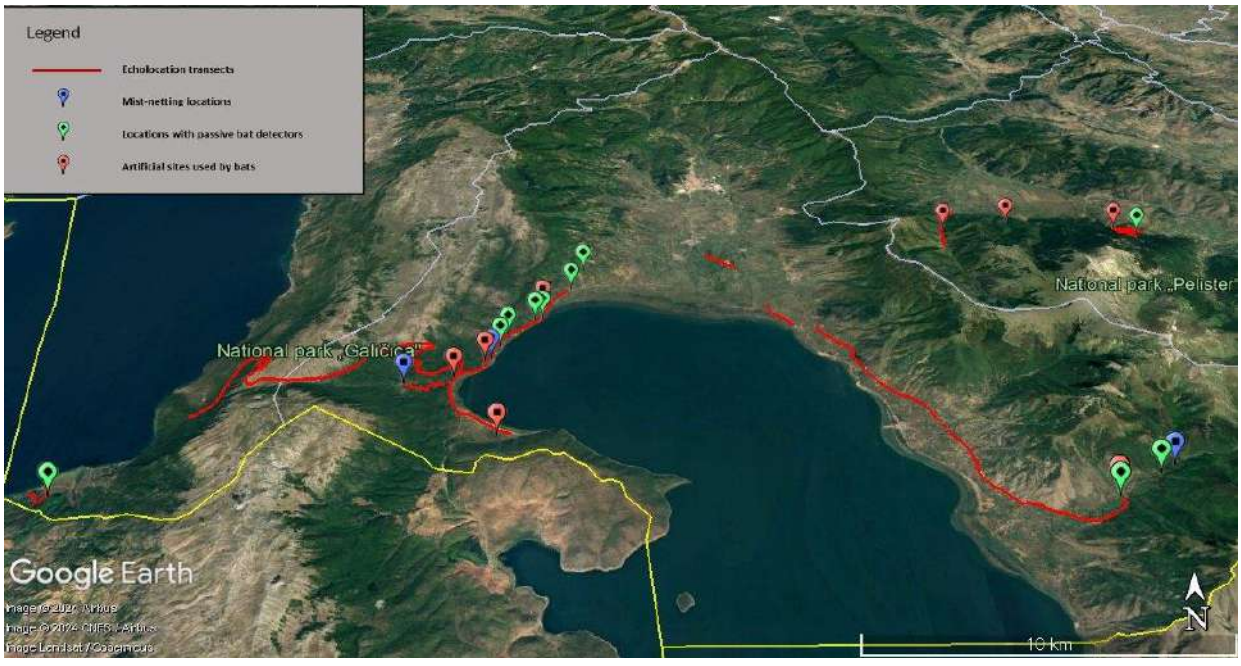

Fig. 21. Locations were surveys of forest-dwelling bats were conducted (red line – echolocation transects; blue pins – mist-netting; green pins –passive bat detectors; red pins –artificial sites used by bats)

Fig. 22. Passive bat detector set in beech forest in Pelister NP

Fig. 23. Setting mist-net in oak forest in Pelister NP

Following species were recorded during the survey: *Pipistrellus kuhlii, Pipistrellus nathusii, Pipistrellus pipistrellus, Pipistrellus pygmaeus, Hypsugo savii, Myotis mystacinus* (Fig. 27)*, Myotis emarginatus* (Fig. 26)*, Myotis myotis/blythii, Myotis capaccinii/daubentonii, Plecotus auratus* (Fig. 24)*, Nyctalus noctula, Nyctalus leisleri, Tadarida teniotis, Rhinolophus hipposideros, Rhinolophus ferrumequinum, Rhinolophus blasii* and *Miniopterus schreibersii.* One *Myotis* individual captured in Oteshevo was identified as *Myotis brandtii* based on the morphological features (Fig. 25). However, we do not count it as new species for Macedonian part of Prespa without genetic confirmation.

Fig. 24. *Plecotus auritus*

Fig. 25. *Myotis brandtii*

Fig. 26. *Myotis emarginatus*

Fig. 27. *Myotis mystacinus*

Ten bat houses specially designed for forest-dwelling bats were purchased. Five of them were mounted on trees in areas where there is lack of natural roosting sites for forest-dwelling bats in both Pelister and Galicica NPs (Fig. 28).

Fig. 28. Locations of the mounted bat boxes on Macedonian side of Prespa

The boxes were mounted at a minimum of 3m height, in an uncluttered location with south or southeast facing (Fig. 29). The bat boxes will be monitored in future to see their effectiveness and usage by bats.

Fig. 29. Mounting the bat boxes in N. Macedonia

Albania

In the forested areas and near wetlands within the Prespa National Park, mist netting was conducted (mentioned above) to identify various species of bats (Fig. 30). During the mist netting operation, we were able to identify several bat species that are more reliable in forest habitats.

Fig. 30. Mist-netting near wetlands

The bat boxes were designed with certain specifications to provide suitable roosts for bats, with the assistance of a skilled woodworker. The PPNEA team provided specific instructions regarding the design and requirements of the bat boxes. The woodworker prepared the necessary materials to construct the boxes according to these specifications. On 31 October, at the PPNEA local office in Gorice e Vogel, a Bat Night event was organized. Volunteers from Korca and Pogradec regions participated in this event, which aimed to raise awareness about bats and their conservation. During the day, the volunteers, under supervision, built most of the bat houses. The remaining bat boxes were constructed by the staff working with bats.

After construction, the bat boxes were placed in the forested areas of Mali i Thate during the following week (Fig. 32). Careful consideration was given to selecting suitable locations for optimal bat habitat. The boxes were placed on relatively thick trees to provide stability and support and were positioned over 3 meters above ground level to protect bats from predators and disturbances (Fig. 31). The boxes were placed in different directions to create variation and facilitate further study purposes. Some bat boxes were placed at varying heights above the ground to observe potential preferences of bats for specific heights.

Fig. 31 Mounting the bat boxes in Albania

Figure 32. Bat boxes locations in Mali i Thate

The bat boxes installed in Mali i Thate will be monitored on an annual basis. Monitoring will involve regular checks to assess occupancy rates and overall bat activity. The data collected will contribute to further studies on bat populations, behaviour, and habitat preferences. These monitoring is also important in terms of their maintenance.

2.4 Improve the protection and proper management of underground habitats

N. Macedonia

During the field visits, an assessment of the status of the known underground sites was also done in order to see the possible threats and conservation measures to be applied. Assessment showed that caves Mechkina Dupka and Samotska Dupka need to be protected by installment of proper protective gates according with the EUROBATS recommendations (Mitchell-Jones et al. 2007).

Mechkina Dupka cave is important roosting site for 4 bat species: *Rhinolophus blasii, R. hipposideros, R. ferrumequinum* and *R. euryale*. However, the cave is under a negative impact from uncontrolled visits and pollution with solid waste. In addition, the existing gate at the entrance of the cave has been destroyed. Considering the current threats the cave is facing and the need to conserve the important bat species found in the cave, we consulted with the park personnel and decided to install a proper gate at the cave's entrance. We engaged an expert to prepare technical documentation for the cave and its entrance, including sketch and dimensions of the gate. A request with the technical documentation was sent to the Nature conservation department within the Ministry of Environment and Physical Planning for getting an approval for gate installment. After the approval was obtained, we engaged a company from Skopje to construct and install the gate. The old gate was removed and the new one was installed on 24 December 2023 (Fig. 33 and 34).

Fig.33. The old gate (left) and the newly installed one (right) at the entrance of Mechkina Dupka cave

Fig.34. Removing the old (left) and installing the new one (right) at the cave's entrance

Although the gate at Samotska Dupka cave is not appropriate for bats (Fig. 35), we decided to leave it as it is and try to replace it in future. There is a large space above the gate at the moment and the bats can freely move.

Fig. 35. Entrance of Samotska Dupka cave

As an addition to our conservation activities, a protective gate was installed at the entrance of Leskoecka cave (Fig. 36) within the project PONT financed project "Protection of cave ecosystems and endangered plant and animal species in the National Park Galicica from the negative effects of climate change". MES expert was consulted and gave approval for the

installment of the gate with the proper dimensions and design following the EUROBATS recommendations.

Fig. 36. The installed gate at the entrance of Leskoechka Cave

Albania

During our expeditions in 11 out of 31 underground sites, including caves, buildings, tunnels, bunkers, and bridges, rubbish was present. This poses a significant threat to bats roosting and hibernating in these sites, as fires have been spotted in several locations, even in the most important roosting site in Prespa, Treni Cave. To address this issue, the Action Plan for the Bats of Prespa was followed, and a cleaning action was conducted in the Shuec tunnel, a previously identified roosting site (Fig. 37). Before commencing the work, it was ensured that no bats were present at the site. All the accumulated rubbish in the tunnels was removed to prevent fires that may highly impact bats roosting there.

While significant progress has been made for this site, there are still huge amounts of rubbish outside the tunnels. This highlights the need for continuous efforts to maintain a clean environment for bats and other wildlife in the Prespa region.

Figure 37. Cleaning Shuec tunnels in Lesser Prespa.

2.5 Raised awareness about importance of conserving bats and their habitats

N. Macedonia

On 27 August 2021, during the celebration of the 25th International Bat Night, we organized an online lecture for bats and bat fauna in N. Macedonia, in cooperation with the Exploring Society Ursus Speleos (Fig. 38). The aim was to raise awareness among students and high schoolers about bats, their role in nature and the need to conserve them and their habitats. MES also regularly posted information for the importance of bat and monitoring and conservation activities in Prespa on the social media.

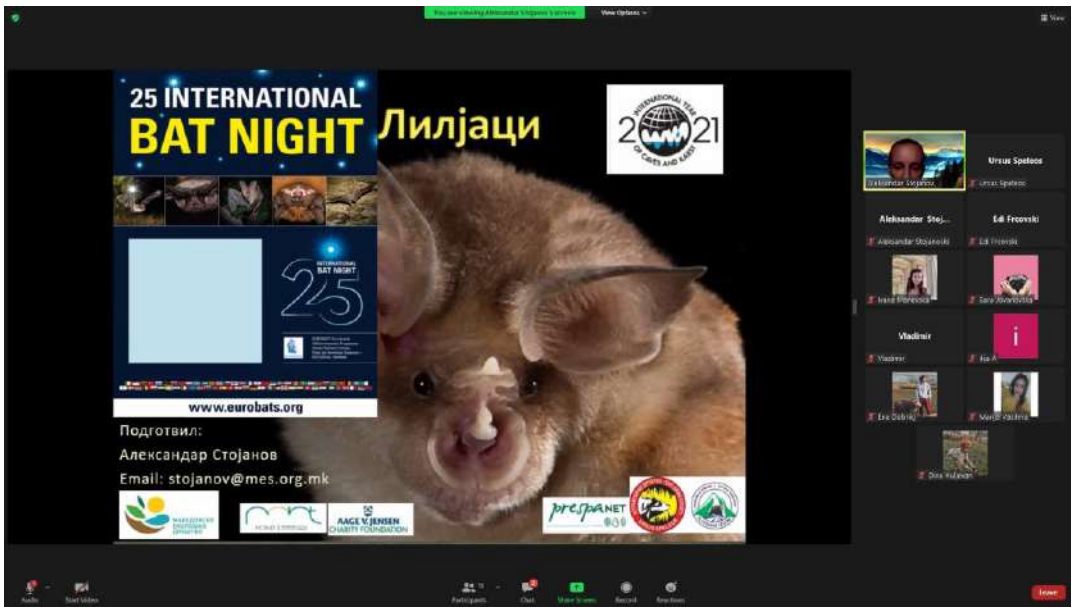

Figure 38. Screenshot of the online lecture for the bats in N. Macedonia

Albania

On the Halloween night on 31 October 2023, we organized a bat night event at our local office in Gorice e Vogel (Fig. 39). This event corresponded with the last day of the Bat Week, a global annual celebration of these fascinating creatures. The Halloween Bat Night event was a unique opportunity for people to learn more about bats and their importance in the ecosystem. The volunteers from Korca and Pogradec came together to help build bat houses, which provide shelter for these animals. In addition to building bat houses, the event also included educational talks on bat ecology and their importance. The participants exchanged knowledge on bat ecology and their importance. By engaging with these volunteers, we were able to raise awareness about bats and their role in the ecosystem.

Figure 39. Activities during the bat night event in Albania

3. Main project outputs

The implementation of the monitoring and conservation activities for the bats in transboundary Prespa resulted with the following main outputs:

- Unified monitoring protocols for cave and forest-dwelling bats;
- Raised capacities of PA staff in bat research and monitoring;
- First systematic data on seasonal use of caves by bats in Prespa;
- Data on the presence and population size of cave-dwelling bats in the caves in Prespa;
- Updated information on forest-dwelling bats in Prespa;
- New roosting sites identified;
- 15 bat boxes mounted in areas with less suitable natural roosting sites;
- Protective gate installed at the entrance of Mechkina Dupka cave following the EUROBATS recommendations;
- Organized action for cleaning Shuec tunnels in Lesser Prespa;
- Awareness among students and volunteers increased.

4. Setbacks

Covid-19 pandemic was one of the main setbacks at the first year of the project. Due to covid, many meetings and workshops were organized online or with limited number of participants. The monitoring activities in Albania started a bit later, as the capacities for bat research were limited and further trainings of PPNEA staff was needed. Also, it was a bit challenging to organize a trip by boat to some caves on Ohrid Lake shore during the summer season. Weather conditions during winter (deep snow cover) were problematic for organizing field visits to remote caves.

5. Conclusions

The first transboundary monitoring of bat populations was implemented successfully in Macedonian and Albanian part of Prespa and resulted with improved knowledge on status of bat populations and annual use of caves by bats. The transboundary monitoring was conducted in the period 2021 – 2024 and resulted with the following:

- The presence of 21 bat species was recorded, among which 17 on Albanian and 20 on Macedonia side;
- One bat species, *Myotis bechsteinii*, was recorded for a first time on Albanian side of Prespa;
- Possibly a new species for N. Macedonia, *Myotis brandtii*, was recorded, but this still needs a genetic confirmation;
- Treni and Bimbilova caves proved to be important roosting sites for bats in Prespa;
- 7 bat species were found in the caves and their presence and population sizes varied across the seasons, and even within one season, from few individuals up to more than 4000 individuals;
- Caves Samotska Dupka, Leskoechka, Bimbilova, Krstova, Naumova and Crna Pesht hosts smaller or larger bat populations throughout the year;
- New natural and artificial roosting sites were identified in both countries;
- Hotel Evropa seems to be very important roosting site for bat in summer, as a mixed maternity colony of about 150 individuals of *Rhinolophus ferrumequinum* and *Myotis emarginatus* was discovered inside the hotel;
- Pollution and uncontrolled visits were observed as threats to the underground sites.

6. Recommendations

Based on the results of the monitoring, we give the following recommendations for future bat monitoring and conservation activities in transboundary Prespa:

- Review and update the existing Action plans for bats and caves with the new findings;
- Continue research and monitoring for both cave-dwelling and forest-dwelling bats;
- Include the Greek part of Prespa in the joint monitoring activities;
- Continue working on conservation of the important underground habitats (cleaning, protective gates etc.);
- Identify and map new natural or artificial bat roosting sites;
- Continue working on improving capacities of PAs in bat research and monitoring;
- Continue working on raising awareness of the public about the importance of conserving the bats and their habitats in Prespa region.

7. References

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8. Annexes

Annex I. List of all bat species recorded with the monitoring in 2021-2024 in Macedonian and Albanian side of Prespa

No.	Species (Latin name)	Species (English name)	Country
1	*Rhinolophus ferrumequinum*	Greater horseshoe bat	MK, AL
2	*Rhinolophus hipposideros*	Lesser horseshoe bat	MK, AL
3	*Rhinolophus euryale*	Mediterranean horseshoe bat	MK, AL
4	*Rhinolophus blasii*	Blasius' horseshoe bat	MK, AL
5	*Myotis myotis*	Greater mouse-eared bat	MK, AL
6	*Myotis blythii*	Lesser mouse-eared bat	MK, AL
7	*Myotis capaccinii*	Long-fingered bat	MK, AL
8	*Myotis emarginatus*	Geoffroy's bat	MK, AL
9	*Myotis mystacinus*	Whiskered bat	MK, AL
10	*Myotis bechsteinii*	Bechstein's bat	AL
11	*Nyctalus noctula*	Noctule	MK
12	*Nyctalus leisleri*	Leisler's bat	MK, AL
13	*Eptesicus serotinus*	Serotine bat	MK, AL
14	*Pipistrellus pipistrellus*	Common pipistrelle	MK, AL
15	*Pipistrellus kuhlii*	Kuhl's pipistrelle	MK
16	*Pipistrellus nathusii*	Nathusius' pipistrelle	MK, AL
17	*Pipistrellus pygmaeus*	Soprano pipistrelle	MK
18	*Hypsugo savii*	Savi's pipistrelle	MK, AL
19	*Miniopterus schreibersii*	Schreibers' bent-winged bat	MK, AL
20	*Plecotus auritus*	Brown long-eared bat	MK
21	*Tadarida teniotis*	European free-tailed bat	MK, AL

PRESPANET PROJECT III

BIODIVERSITY CONSERVATION IN TRANSBOUNDARY PRESPA

prespaNET

A NETWORK OF ENVIRONMENTAL NGOS FOR PRESPA

MACEDONIAN ECOLOGICAL SOCIETY

PPNEA

SOCIETY FOR THE PROTECTION OF PRESPA

11TH JANUARY 2024, SUBMITTED BY EURONATUR

INTRODUCTION

This proposal presents the PrespaNet project, "**Biodiversity Conservation in Transboundary Prespa**", submitted by the NGO network partners the Macedonian Ecological Society, the Society for the Protection of Prespa and Protection and Preservation of the Natural Environment in Albania, through EuroNatur, who will manage the grant. The proposed project will run for three years from 1st March 2024 to 28th February 2027, and its constituent parts have been developed as the result of: a) a review of the Transboundary Strategic Framework for conservation carried out in the last project, which helped to highlight priorities; b) a series of workshops to refine these priorities, focus on those with trilateral significance and to which the NGOs' specific expertise and resources could be most effectively applied; and c) an evaluation of previous successes and strengths, together with a consideration of what previous work should be built upon or extended.

The partners have already successfully raised €855,901.61 of support for this proposal from the Prespa Ohrid Nature Trust. PrespaNet asks the Aage V. Charity Foundation to support the project with €471,311.43. The total budget of the project amounts to €1,327,213.04, almost two-thirds of the total budget are already secured.

EXECUTIVE SUMMARY OF THE PROPOSAL

The project consists of four strategies, the first of which concentrates on the **urgent threat of climate change**, whose effects are increasingly apparent in Prespa, and its **impacts on the wetland landscape and waterbirds**. '*Water and Wetland Landscape Conservation*' aims firstly to **interpret the varying effects of climate change on the status of Prespa water bodies**. It will include policy work to organise our scientific knowledge on Prespa water resources, as well as gathering together those working in this scientific field at a symposium for Prespa waters, in order to help focus efforts and knowledge 'on the same page'. Secondly, the strategy will include targeted **activities for wetlands and waterbirds that emphasise the transboundary outlook needed for their conservation in the changing conditions we are experiencing under climate change impacts**. We will aim to understand waterbird trends and wetland use at a cross-border level and establish reference values, informing conservation action, which needs constantly updated information in such dynamically changing conditions in order to be proactive and effective in responding to challenges as they arise.

Our second strategy builds on what we consider to be the proven **strengths and successes of the network** from our previous projects and track record. '*Consolidating Prespa Conservation Interests*' brings together our most important role in **supporting the mandated managers of protected areas** and building capacity where needed, as well as our long-running successful Prespa Field Laboratory programme to **support and develop the next conservation generation**. This

strategy will use conservation studies and biodiversity monitoring as tools to **build capacity in protected area management** and to offer opportunities to early career or post-graduate conservationists to gain experience, **contribute to increasing knowledge of Prespa biodiversity** and support targeted research in the field. In addition, we plan to continue our hugely successful programmes for students and young local people, whether with top-quality summer schools, **learning opportunities to strengthen their studies** in specialised field camps or **inspiring a passionate love of nature** through the ever popular Wild Side of Prespa programme. The strategy takes a participatory approach and aims to attract and build a new energy and dynamism in the region in the long term.

In '*On the Frontline – Combating Priority Threats*' we **focus on important identified threats**, in particular those for which we have the relevant expertise or experience and which are not otherwise addressed. We plan to take a **transboundary and landscape approach** to these issues, characterising and pinpointing vulnerable landscape features and places, which are often sensitive to, and subject to, multiple threats. Amongst these we will tackle the **impacts of unsustainable energy installations** in particular, formulating policy documents and communicating on how to deal with this pressing issue, seeking to **reconcile the urgent need for renewable sources of energy with the 'wild west' developments** that are encroaching ever closer on the region. Likewise, we will take steps to **fight wildlife crime in Prespa**, working closely with stakeholders, setting up a transboundary network for co-operation on this subject whilst raising awareness of the stakes and impacts of such illegal activity.

In '*Listen and Share: Reinforcing Local Engagement*', all the above will be underpinned by close **transboundary collaboration** and a joint approach to project management. We'll likewise continue to communicate our work, the conservation challenges we face together and the incomparable natural wealth of Prespa. This strategy also takes in support and development of the vital role our local offices play in cementing conservation at the heart of the community's agenda.

Lastly, through '*Programme Support*' the project foresees solid management of the grant by EuroNatur, underwriting the NGOs' solemn commitment to robust technical and financial management, as well as a programme of organisational development for which the Prespa Ohrid Nature Trust has generously offered 'unrestricted' funds in order to allow MES and PPNEA to further develop their institutional, administrative, management and personnel capacities in support of their conservation work in Prespa.

After a decade of dedicated effort for conservation, and with transboundary collaboration at its core, the PrespaNet NGO network has matured significantly and plays a crucial role in supporting transboundary stakeholders, who are in dire need of such a constructive example and guidance. We continue to believe that maintaining this momentum is **the only hopeful and sustainable way to ensure a future for this remarkable part of the world**.

SUMMARY BUDGET AND FUNDS SOUGHT

	Total costs	Secured funds from PONT	Co-funding sought
PPNEA	€471,185.00	€353,388.75	€117,796.25
MES	€670,021.14	€502,515.86	€167,505.29
SPP	€170,934.89	-	€170,934.89
EuroNatur	€15,075.00	-	€15,075.00
TOTAL	**€1,327,213.04**	**€855,901.61**	**€471,311.43**

PrespaNet and EuroNatur are requesting an amount of €471,311.43 for the period of 1st March 2024 to 28th February 2027. Two-thirds of the project are already covered by PONT. However, PONT requests co-funding of 25 % and SPP as well as EuroNatur are not eligible. PrespaNet asked EuroNatur to submit the proposal at Aage V. Jensen Charity Foundation.

The biggest share of the budget is with MES. As SPP isn't eligible at PONT, the total share of SPP is requested from Aage V. Jensen Charity Foundation. EuroNatur is part of the project as manager of the grant and advisor.

PROJECT OBJECTIVES AND ACTIONS

OBJECTIVES

NOTE: objectives relate to each strategy as a whole and not to particular components and/or actions.

STRATEGY 1: WATER AND WETLAND LANDSCAPE CONSERVATION

OBJ-A – Inform decision-making on water and wetland management planning through a common understanding of climate change effects in Prespa

OBJ-B – Improve the conservation status of important wetlands in Prespa through ecological restoration, supporting the work of protected area authorities

OBJ-C – Promote sustainable wetland management through stakeholder engagement

STRATEGY 2: CONSOLIDATING PRESPA CONSERVATION INTERESTS

OBJ-D – Foster long-term conservation partnerships with protected area authorities through environmental monitoring of important biodiversity components

OBJ-E – Examine ecological connectivity between protected areas at local and transboundary levels to identify conservation priorities

OBJ-F – Support participatory monitoring and nature immersion to promote behavioural change and complement monitoring and ecological education efforts by protected area authorities

OBJ-G – Promote Prespa as a field laboratory to encourage the future wave of conservationists to work in Prespa by promoting the Prespa basin as a field laboratory

STRATEGY 3: ON THE FRONTLINE – COMBATING PRIORITY THREATS

OBJ-H – Identify and document threats to key values of Prespa to promote effective conservation

OBJ-I – Engage in advocacy and outreach initiatives to mitigate identified threats and safeguard the transboundary Prespa region

STRATEGY 4: LISTEN AND SHARE – REINFORCING LOCAL ENGAGEMENT

OBJ-J – Transboundary co-operation strengthens the network partnership and raises the capacity of the NGO sector in Prespa

OBJ-K – Sustain the operations of local offices to ensure efficient national and transboundary co-ordination for conservation, research, monitoring, education, and participatory activities

OBJ-L – Reassure local communities of the network's long-term and steadfast commitment to the region

PROGRAMME SUPPORT

OBJ-M – The project actions are completed on budget and on time

OBJ-N – Improve the overall effectiveness and performance of the network

ACTIONS

STRATEGY 1: WATER AND WETLAND LANDSCAPE CONSERVATION

1.1: Water resources: towards a common interpretation of the varying effects of climate change on the status of Prespa water bodies

1.1.1 Organise existing scientific knowledge on water resources

1.2: Wetlands and waterbirds: thinking across borders for conservation in changing conditions under climate change impacts

1.2.1 Understanding waterbird trends and wetland use, informing conservation action

1.2.2 Deepen scientific understanding of how Prespa wetland reconfiguration is taking place

1.2.3 Conservation of wetlands in dynamically changing conditions

1.2.4 Cross-border co-ordination of wetland conservation actions

STRATEGY 2: CONSOLIDATING PRESPA CONSERVATION INTERESTS

2.1: Capacity building through wildlife monitoring

2.1.1 Support protected areas and PrespaNet partners in wildlife monitoring

2.1.2 Monitoring+ – following up on what's been learned

2.1.3 Wildlife byways – Prespa in geographical context

2.2: Prespa Field Laboratory

2.2.1 Wild side of Prespa – wildlife inspiration and nature connection for environmental behaviour change

2.2.2 Prespa as a field for study – the next conservation generation

STRATEGY 3: ON THE FRONTLINE – COMBATING PRIORITY THREATS

3.1: Threats to Prespa at a landscape scale

3.1.1 Landscape characterisation and assessment – pinpointing vulnerable features and places

3.2: Spotlight on priority threats

3.2.1 Paving the way towards fighting wildlife crime in Prespa

3.2.2 Against the impacts of unsustainable energy installations

STRATEGY 4: LISTEN AND SHARE: REINFORCING LOCAL ENGAGEMENT

4.1: Conversations, co-operation and connections

4.1.1 Communication is key

4.1.2 Transboundary collaboration

4.1.3 Sustain the function of the local offices

PROGRAMME SUPPORT

5.1: *Smooth operations and institutional growth*

5.1.1 Project management

5.1.2 Organisational development

PROPOSED CONSERVATION ACTIONS

STRATEGY 1: WATER AND WETLAND LANDSCAPE CONSERVATION

In the Prespa basin, the developing manifestations of climate change, such as prolonged periods of drought, a marked reduction in snow cover, higher temperatures and subsequent effects on hydrology and lake water levels, highlight the need to develop appropriate adaptive plans to protect biodiversity and conserve ecosystems. Although a body of knowledge has been produced by scientists over the years, this remains fragmented within states or projects, and contains unresolved questions and sometimes contradictory conclusions for admittedly very complex issues. Acknowledging that good knowledge and a common understanding of the water resources' status and challenges are fundamental developing appropriate water management measures to meet both ecological and human needs across the basin, this strategy will aim to consolidate existing information and use it to interpret the varying effects of climate change on the status of Prespa water bodies. Based on transboundary consensus, proposals will be put forward on how to mitigate or adapt to these effects, for the benefit of both local societies and the protected biodiversity and habitats.

In the meantime, the effects of the climate crisis are also seen in wetland configuration, through changes in structure and vegetation, and have been documented within previous PrespaNet projects, with the PrespaNet organisations working both independently and in co-ordination with each other, related national stakeholders and protected area authorities. This increased knowledge goes hand in hand with addressing threats, proposing measures, and implementing wetland habitat restoration and conservation actions, while also promoting sustainable solutions and creating synergies between protected area authorities and stakeholders. Changes in wetland configuration result in an evident alteration of wetland functions, especially noted in the use of wetlands by waterbird species. Within the second component of this strategy a joint endeavour to document changes in waterbird distribution patterns, identify potential threats, set reference values and increase the ability to respond to changes, will complement the continuing work of responding to shifts in wetland and riparian habitats. These are the necessary next steps to link species populations to conservation actions for wetlands and riparian habitats and establish a detection system for both abrupt and more subtle changes in waterbird distribution patterns, including the detection of zoonotic diseases across the basin. The combined efforts for deciphering changes in wetland configuration and pattern in species populations will promptly inform conservation action, in dynamically changing conditions, enabling conservation action to be proactive and effective in responding to challenges as they arise.

STRATEGY 1 OBJECTIVES:

NOTE: objectives relate to the strategy as a whole and not to particular components and/or activities.

OBJ-A – Inform decision-making on water and wetland management planning through a common understanding of climate change effects in Prespa
OBJ-B – Improve the conservation status of important wetlands in Prespa through ecological restoration, supporting the work of protected area authorities
OBJ-C – Promote sustainable wetland management through stakeholder engagement

1.1: Water resources: towards a common interpretation of the varying effect of climate change on the status of the water bodies

Transboundary Prespa: Albania, Greece, North Macedonia

Background/problem analysis:

Scientific research and periodic or ad hoc measurements of parameters has been conducted for many decades in the lakes and rivers of the Prespa catchment. The focus has been on the hydrology of the basin and its hydrological connection with the Ohrid catchment basin, the significant decrease of the water level of Great Prespa Lake in the 1980s and the 2010s, waters quality issues including eutrophication, aquatic ecosystems and related biological parameters and biodiversity and the potential impact of climate changes on the hydromorphology of the water bodies. This body of knowledge has been produced by scientists who are either nationals of the three littoral countries, working both separately and in collaboration, or nationals of third states working alone or together with local experts, and it contains unresolved questions and sometimes contradictory conclusions for what are acknowledged to be very complex issues.

Stakeholder dialogue is ongoing at various levels regarding the state of Prespa waters, in view of their great importance for livelihoods (both agriculture and tourism) and for sustaining related ecosystems and biodiversity. Various opinions and ideas for interventions have been put forward, sometimes based on scientific conclusions or even on widespread misconceptions. Some of these ideas do not align with current principles for sustainable water management adopted at EU and international levels. Moreover, the already evident effects of climate change, increase the urgency for fully understanding the causes and mechanisms of these unfolding changes and developing plans, based on a transboundary consensus, for how to mitigate them, or should this prove unfeasible, adapt to them, for the benefit of both the local societies and the protected biodiversity.

Aim/s:

Acknowledging the fact that a common understanding of the water resources' status and challenges is fundamental for developing appropriate water management measures, and in view of the situation described above, component 1A aims to achieve objective **OBJ-A**, through:

- Enhancing cross-border water dialogue and exchange of information in the Prespa basin
- Compiling and assessing existing scientific literature, including published papers, monitoring reports and measurements, as well as the provision of complementary basic water quality data for Albania
- Identifying key robust scientific conclusions, if any, on the status of the water bodies
- Identifying the main contradictory scientific findings, if any, that indicate the need for further investigation
- Achieving a better and common understanding of the water bodies' status and main threats and trends across the basin

A common understanding of the water bodies' status is necessary to design and plan ecological restoration actions, especially for wetland habitats and biodiversity, while the necessary cross-border dialogue will engage stakeholders, strengthening existing collaboration platforms. Therefore, it is expected that both information exchange through cross-border dialogue and assessment of existing

knowledge will further contribute towards objectives **OBJ-B** and **OBJ-C** (see also Strategy 1.2 below). In addition, a symposium planned for autumn 2025 will bring together the science community, policy makers, practitioners and researchers to share state-of-the-art research and discuss how to best support climate change adaptation and mitigation measures, building resilience of aquatic ecosystems, habitats and species (contribution to all objectives **OBJ-A, OBJ-B** and **OBJ-C**).

***Expected results of these actions*:**

a. Enhanced level of knowledge and a common understanding of the water resources' status and challenges
b. Standardised information on key valid scientific conclusions and the main contradictory scientific findings in the field of water
c. Enhanced cross-border water dialogue and exchange of information, with NGOs, PA managers, local and regional water body authorities actively engaged in sharing knowledge about water issues in Prespa
d. PrespaNet partners jointly and concertedly participate in developing appropriate water management measures at national level and in a transboundary setting.

Description of actions, activities and deliverables:

Action 1.1.1 Organise existing scientific knowledge on water resources:

i. A trilateral working group with the participation of NGO officers and external water experts, will collect and assess all Prespa water material, then present the main conclusions in a digital volume
ii. Set up a "mini-lab" in Albanian Prespa, to provide measurements of water quality parameters to the general public in quarterly bulletins and to contribute to the data compilation and assessment
iii. Organise a scientific symposium in Albania with the participation of national and international scientists in fields related to current issues on the status of water bodies. Indicative topics include (a) Understanding the disaster risk to water ecosystems, habitats and associated species, (b) defining thresholds for the ecology, species and habitats diversity of the lakes, (c) Ecosystem resilience vs. society resilience, (e) Native biodiversity and alien species, (f) Environmental pollution and eutrophication, (g) adaptive & resilient design of water use and agriculture and (h) building awareness and trust among communities, inclusive decision-making on future climate risks and ecosystem processes

DELIVERABLES:

a. **SPP (with PPNEA/MES)**: Digital volume: Common understanding of the water resources' status and challenges
b. **PPNEA**: Quarterly bulletins on water quality monitoring data (Albania only)
c. **PPNEA**: Proceedings of the scientific symposium

Duration: 3 years

Cost analysis: €36,069 (TOTAL all NGOs)

MES total €745

Personnel: €142.50; **Personnel:** €152.50; **Third party:** €450

PPNEA total €9,576.75

Travel/meeting costs: €456.75; **Third party:** €3,750; **Equipment:** €1,100; **Consumables and other:** €4,270

SPP total €25,747.25

Travel/meeting costs: €400; **Personnel:** €17,347.25; **Third party:** €8,000

1.2: Wetlands and waterbirds: thinking across borders for conservation in changing conditions under climate change impacts

Transboundary Prespa: Albania, Greece, North Macedonia

Background/problem analysis:

The long-standing water level decrease in Great Prespa Lake and low water levels in spring for Lesser Prespa Lake affect wetland habitats and their functions. Habitat changes along the littoral zone have been largely documented and are being monitored, based on the detailed maps produced by PrespaNet, while an alteration of functions, especially in relation to the use of wetlands by waterbird populations is expected.

Waterbird populations in Prespa are adapting to the emerging situation and it is important to monitor and detect early changes in waterbird distribution patterns and potential threats due to fluctuations in littoral and riparian lands.

Within the last five years, the PrespaNet NGOs have advanced their knowledge regarding wetland habitat configuration (i.e., wetland habitat mapping and monitoring), addressed threats and proposed measures (i.e., feasibility studies for the restoration of wet meadows and alder forests), and implemented wetland habitat restoration and conservation actions (i.e. restoration of wet meadows and alder forests, conservation of reedbeds, etc.). This work has been successful in restoring important habitats within protected areas, but also in promoting sustainable solutions and synergies between protected area authorities and stakeholders. A forum for information exchange and planning wetland conservation action between stakeholders, organisations and local authorities has been in operation for seven years, supporting wetland conservation decisions and implementation.

Aim/s:

In relation to waterbird populations and birds of the littoral habitats, this project will aim to consolidate all existing information, establish common monitoring goals and acquire the appropriate knowledge and tools for the conservation of these populations and their habitats within the dynamically changing circumstances described above, taking an integrated transboundary approach.

Building upon successful conservation action for wetland habitats, PrespaNet will seek to address a wide variety of issues and threats to wetland habitats, ultimately seeking to restore or improve wetland functions, through: (a) monitoring the dynamic changes of wetlands along the receding waterline; (b) modelling fire dynamics in wetland habitats; (c) exploring the effect of agriculture on wetlands; and (d) preparing a feasibility study for the eradication of invasive plant species and applying In relation to wetland conservation and restoration. Moreover, PrespaNet will continue and expand existing work on wet meadow management and alder forest restoration in Ezerani Nature Park, as well as follow-up existing habitat management guidelines (e.g. the grazing management plan in Albania) and investigate further options for restoring wetland habitats, such as reedbeds, and their function.

Existing fora, such as the TWMTG will continue to operate, and will further aim to raise awareness of current threats to the wetland ecosystems and promote their protection and conservation to wider fora, national authorities and transboundary collaboration schemes such as the Prespa Park Co-ordination Committee.

The outcomes of monitoring, research and in-depth information exchange meetings will contribute to understanding impacts of climate change on habitats, biodiversity and important waterbirds populations in Prespa (objective **OBJ-A**). This integrated approach will support existing wetland conservation efforts, identify joint threats and define further appropriate conservation actions (objective **OBJ-B**). Engaging stakeholders in species and habitat restoration (objective **OBJ-C**) will also be addressed, as a prerequisite for successfully implementing conservation action in the project and as a means to establish a mechanism towards the sustainable continuation of activities beyond the project.

***Expected results of these actions*:**

a. Increased knowledge on breeding locations, breeding population sizes and habitat use of targeted waterbirds and bird populations of selected shoreline habitats
b. Increased capacities and knowledge for all partners and participating PA managers (e.g. Galicica National Park/ Ezerani Nature Park) through shared organisation of fieldwork, training, data sharing and increase in number of participating people, including volunteers
c. Organised response to a potential zoonotic disease to waterbirds at the trilateral level
d. Wetlands restored and/or protected and functions improved
e. Stakeholder engagement in management, restoration and waterbird monitoring actions
f. Increased knowledge on fertilizer/ pesticide use through collaboration with local farmers, leading to insight on the effects of agriculture on wetlands

List of actions, activities and deliverables

Action 1.2.1 Understanding waterbird trends and wetland use, informing conservation action

i. Transboundary research and monitoring on spatial habitat use and distribution of targeted species
ii. Targeted monitoring of colonial waterbirds in Golem Grad (MKD) and Lesser Prespa Lake (AL)
iii. Surveys of breeding birds along important shoreline habitats, such as riparian forests and cliffs
iv. Preparatory action for addressing a zoonotic disease outbreak at the transboundary level

DELIVERABLES

a. **MES/PPNEA/SPP**: Annual survey/monitoring reports on the populations of waterbirds and birds of riparian habitats

Action 1.2.2 Deepen scientific understanding of how Prespa wetland reconfiguration is taking place

i. Monitoring changes of the Great Prespa Lake shoreline: mapping wetland transformation and determining causes through drone photograph analysis
ii. Modelling of fire dynamics in reeds: use of open datasets and GIS software, to determine past wildfire events and designate sensitive areas (MKD)

DELIVERABLES

a. **MES**: Report on habitat dynamics in coastal Prespa between 2018-2024 with an orthophoto mosaic (MKD)
b. **MES**: Report on fire dynamics in wetlands in Prespa with preventative management recommendations (MKD)

Action 1.2.3 Conservation of wetlands in dynamically changing conditions:

i. Follow-up wetland conservation activities relating to Grazing Management Plan (AL)
ii. Promote water-resilient local varieties of pear and quince trees (AL)
iii. Expansion of alder forest restoration/management
iv. Increase the areas of wet meadows that are managed and expand co-operation with livestock farmers (MKD)
v. Small-scale wetland restoration: exploring options for knowledge sharing/practical experience and jointly develop restoration plans with relevant stakeholders/authorities (MKD)
vi. Explore the impacts of agricultural practices on wetlands
vii. Implementation of pilot actions to control invasive species in selected sites (MKD)

DELIVERABLES:

a. **PPNEA**: Detailed plan with recommendations for implementation of follow-up measures arising from the Grazing Action Plan in Prespa National Park (AL)
b. **PPNEA**: Report on the implemented follow-up Grazing Action Plan activities (AL)
c. **MES/PPNEA**: 3,000 alder seedlings produced and planted annually for a total of at least three reforested hectares (MKD), up to 3 volunteer reforestation actions organised (AL)
d. **MES**: At least seven additional hectares of managed wet meadow surfaces (MKD)
e. **MES**: Small-scale/pilot wetland restoration plan (MKD)
f. **MES**: Report on annual fertiliser and pesticide use in Prespa (MKD)
g. **MES**: Feasibility study for the eradication of invasive false indigo and black locust plants in Ezerani Nature Park and pilot application in selected sites

Action 1.2.2 Cross-border co-ordination of wetland conservation actions

i. Annual meetings of the Transboundary Wetland Management Technical Group (TWMTG), to exchange information, consolidate actions and results and plan co-ordinated action
ii. Key environmental managers jointly meet and discuss recommendations and ongoing wetland management efforts in the basin at transboundary level

DELIVERABLES:

a. **MES/PPNEA/SPP**: Three annual meetings and outcome reports of the Transboundary Wetland Management Group (TWMTG) held in each country, as a responsibility of the respective project partner.

Duration: *Three years*

Cost analysis: €104,110.88 (TOTAL all NGOs)

MES total €45,351.64

Travel/meeting costs: €8,804.75; **Personnel:** €16,161.89; **Third party:** €3,860; **Equipment:** €13,325; **Consumables and other:** €3,200

PPNEA total €15,730.25

Travel/meeting costs: €3,705.25; **Personnel:** €9,045; **Equipment:** €1,875; **Consumables and other:** €1,105

SPP total €43,028.99

Travel/meeting costs: €6,300; **Personnel:** €36,528.99; **Consumables and other:** €200

STRATEGY 2: CONSOLIDATING PRESPA CONSERVATION INTERESTS

Prespa is known for its exceptional biodiversity values and unique ecosystems, including wetlands, forests, and lakes, which provide habitats for numerous species. The presence of, amongst others, the endangered Balkan lynx in the Prespa region highlights the importance of preserving and protecting the area's biodiversity. Efforts to conserve this globally critical endangered species are crucial for its long-term survival and contribute to the overall conservation goals of the region. Monitoring of Balkan lynx and its main prey species, chamois and roe deer, help to ensure the protection of the species and its habitat in Prespa.

Working together with protected area managers in the basin, PrespaNet can support them to share knowledge, resources, and challenges, and complement each other's monitoring efforts. This collaborative approach helps ensure that conservation efforts are co-ordinated across the basin.

Conservation efforts and scientific research on biodiversity in Prespa are of great importance and contribute to the overall ecological health of the region. Preserving and protecting biodiversity values is crucial for maintaining the delicate balance of the ecosystem and contributes to the long-term

sustainability of the area. The importance of maintaining ecological corridors and connectivity between habitats is also recognised, and constitutes an important conservation priority for the PrespaNet partners.

Lastly in this strategy, nature education through outdoor learning for schoolchildren and young people, particularly the Wilde Side of Prespa education programme, is an important part of our conservation effort. Knowledge transfer at transboundary level between university students and PrespaNet will continue to raise capacities for future young conservationists through transboundary summer camps and opportunities to carry out research in Prespa that contributes to conservation goals.

STRATEGY 2 OBJECTIVES:

NOTE: objectives relate to the strategy as a whole and not to particular components and/or activities.

OBJ-D – Foster long-term conservation partnerships with protected area authorities through environmental monitoring of important biodiversity components
OBJ-E – Examine ecological connectivity between protected areas at local and transboundary levels to identify conservation priorities
OBJ-F – Support participatory monitoring and nature immersion to promote behavioural change and complement monitoring and ecological education efforts by protected area authorities
OBJ-G – Promote Prespa as a field laboratory to encourage the future wave of conservationists to work in Prespa by promoting the Prespa basin as a field laboratory

2.1: Capacity building through wildlife monitoring

Transboundary Prespa: Albania, Greece, North Macedonia

Background/problem analysis:

In the Prespa basin, building the technical capacities of protected area managers remains a priority for PrespaNet partners. While previous attempts have involved joint monitoring efforts, most practitioners still lack the capability to independently organise successful wildlife monitoring without support. The challenge is compounded by frequent staff turnover within their administrations, disrupting the continuity of institutional knowledge and expertise, and hindering consistent monitoring efforts. Thankfully, instances of success are evident, such as the independent monitoring programme of NP Galičica, initially strongly backed by PrespaNet. Nevertheless, it remains crucial to foster collaborative initiatives, including those between protected area managers, even at a transboundary level. These endeavours are indispensable for elevating their technical capacities, empowering everyone involved to autonomously conduct efficient wildlife monitoring.

On the other hand, the internal expertise of the partners presents a valuable avenue for capacity building also within PrespaNet, capitalising on differences in accumulated experience and knowledge between the partners. An illustrative instance is the expertise in roe-deer density acquired in North Macedonia[1] during the ongoing project phase, which we aim to now roll out across the basin in Albania

[1] Melovski D., Pavlov A. & Halotel Y. 2022. Roe deer density estimation in Galichica and Pelister National Parks. Macedonian Ecological Society, 18 pp.

and Greece. This transfer of knowledge is pivotal for the conservation of biodiversity in the region and important for levelling up between the network partners.

Lastly, PrespaNet recognises the critical importance of preserving habitat connectivity, especially for species with wide-ranging territories like the Balkan lynx and brown bear, extending the necessity for monitoring efforts beyond the Prespa basin. As a result, we embarked on a three-year assessment of bio-corridors in Albania and North Macedonia (under separate funding). Concurrently, efforts were initiated to identify all corridors to and from Prespa, enabling PrespaNet to now also begin monitoring these crucial and little-known areas, and contribute to a more comprehensive conservation of the region and its emblematic species.

Aim/s:

The primary aim of this strategy is to continue the invaluable core work of strengthening the partnership between protected areas and PrespaNet partners through the medium of joint monitoring work in Prespa, addressing **OBJ-D**. Acknowledging the still low capacity for their mandated work in many areas, the partners aim to continue to support protected area personnel and managers, building skills and experience. The partners will achieve this through monitoring and research on selected key endangered mammal species in Prespa basin, that are important components of the protected areas wildlife monitoring programmes. These collaborative efforts help to improve the technical capabilities of protected areas, ultimately enabling them to monitor wildlife effectively and independently.

In addition, the partners will address **OBJ-E** with work on bio-corridor threats, bottlenecks and opportunities for ecological connectivity, with joint study visits to the already identified bio-corridors in North Macedonia in order to pinpoint conservation priorities in these areas.

***Expected results of these actions*:**

a. Increased capacities of the PAs staff in the Prespa basin, particularly regarding wildlife monitoring
b. Expertise shared between PrespaNet partners, strengthening and balancing capacity at transboundary level
c. Assessment of chamois populations and connectivity between the most suitable habitats for the species in the Prespa basin
d. Completed picture of roe deer density across the basin with regard to its status as a prey species for the Balkan lynx

Description of actions, activities and deliverables:

Action 2.1.1 Support protected areas and PrespaNet partners in wildlife monitoring:

i. Support to Galicica National Park and Pelister National Park (MKD), and Prespa National Park (AL) for wildlife monitoring programmes
ii. Continued extensive camera trapping sessions to monitor lynx presence in the area, with the support of local office staff(AL)
iii. Monitor isolated chamois population and (AL) and continue facilitating cross border monitoring with Galičica National Park (MKD)

DELIVERABLES:

a. **PPNEA**: Lynx camera trapping report
b. **PPNEA**: Chamois monitoring report

Action 2.1.2 Monitoring+ – following up on what's been learned

i. Bat conservation measures, including installation of bat boxes, map of tree roosting sites and revision of the Bat Action Plan
ii. Study on roe deer density, completing the picture basin-wide and following methodology piloted by MES in the current project (GR/AL)

DELIVERABLES:

a. **MES**: Review of Bat Action Plan

b. **MES**: Installation of 10-15 bat boxes
c. **MES**: Map of potential tree roosting sites for bats in Galičica National Park and artificial roosting sites in the Wider Prespa Area
d. **MES**: Bat monitoring report: population size estimates, site-specific life-history insight and future research recommendation
e. **PPNEA/SPP**: Roe deer density study reports

Action 2.1.3 Wildlife byways – Prespa in geographical context:

i. Compile published data and private databases for select groups and identified corridors (Jablanica, Ilinska-Plakjenska, Bigla, Karaorman)
ii. Identify priority corridors for monitoring
iii. Assemble in-house expertise (potentially PrespaNet-wide) to perform monitoring and obtain data to inform future monitoring and conservation recommendations for crucial corridors and bottlenecks within them

DELIVERABLES:

a. **MES**: Short inventory report on selected corridor(s) and future monitoring recommendations

Duration: 3 years

Cost analysis: €28,068.26 (TOTAL all NGOs) 28,068.26

MES total €16,279.78

Travel/meeting costs: €9,779.75; **Personnel:** €5,475.03; **Equipment:** €875; **Consumables and other:** €150

PPNEA total €8,420.70

Travel/meeting costs: €2,232.50; **Personnel:** €5,443.20; **Equipment:** €362,50; **Consumables and other:** €382.50

SPP total €3,367.78

Travel/meeting costs: €100; **Personnel:** €3,267.78

2.2: Prespa Field Laboratory

Transboundary Prespa: Albania, Greece, North Macedonia

Background/problem analysis:

Despite being in close proximity to one of Europe's oldest lakes, the educational and recreational potentials of Prespa are frequently overlooked by those residing nearby. Conversely, international students of biological and environmental sciences often approach Prespa with enthusiasm. Whether recognising it as a key biodiversity area, a success story in biodiversity conservation, or as an exemplar of conflicts between nature and people, the allure of Prespa captivates the curiosity of driven students. For these individuals, the region becomes a priority destination to gain environmental, biological, and conservation knowledge and experience. Nevertheless, Prespa's remoteness and transboundary nature have historically discouraged students from visiting and developing their capacities in the region. Fortunately, PrespaNet has established some ambitious programmes to complement students'

academic curricula with exciting fieldwork opportunities that have turned Prespa's obstacles into aids to learning and working in the region, and maintaining this momentum should be an imperative in order to exploit these circumstances for the mutual benefits of Prespa and the future wave of environmentalists in the transboundary basin and beyond.

PrespaNet considers it a privilege to enhance wildlife conservation capacities in the unique and abundant Prespa region. Years of dedicated commitment to research-based conservation, as evidenced by established studies and programmes, underscore the network's unwavering focus. The creation of a comprehensive experience, spanning from research to engaging environmental stakeholders and students, is notably reflected in the five transboundary summer schools organised to date. This holistic approach has proven highly successful, with some alumni seamlessly transitioning into our Young Conservationist Programme or even being directly recruited by PrespaNet partners and protected area managers. This underscores the vital role of such training and supplementary educational events in addressing the shortage of practitioners in the nature conservation sector.

Aim/s:

The activities aim to address **OBJ-F** by offering a wide variety of platforms to complement ecological education efforts by protected area managers, attracting a range of ages from the next generation to the transboundary Prespa basin, from schoolchildren to university students, and engaging them in nature conservation priority topics that promote behavioural and value changes changes through one of our established programmes (see activities). Teacher training programmes on outdoor education will also ensure continuity of efforts with schoolchildren and high school students.

In addition, **OBJ-G** will be addressed by raising the capacities of future conservationists, through involving them in real world research and monitoring in partnership with PrespaNet and protected areas. Through such unique experiences we aim to entice the new generation of conservationists to practice in Prespa, building on what we have already successfully begun.

***Expected results of these actions*:**

a. Environmental behaviour change among locals driven by new-found wildlife inspiration and nature connection, through direct experiences in nature
b. Strengthened transboundary environmental education capacities between and amongst PrespaNet partners and environmental stakeholders
c. Knowledge and experience exchanged among university students/young conservationists and PrespaNet while creating stronger connections and prospects for future collaborations in the area
d. Complementary support to university curricula through students' engagement in real-world research with PrespaNet and protected areas

Description of actions, activities and deliverables:

Action 2.2.1 Wild side of Prespa – wildlife inspiration and nature connection for environmental behaviour change

i. Annual monitoring and research field trips, including spring field trip to Ezerani Nature Park, with tailored monitoring practice sessions, using citizen science materials developed by PrespaNet (monitoring field guide, monitoring apps, databases, etc.)
ii. Indoor environmental education activities mostly aimed at younger audiences using specific engaging educational materials developed by PrespaNet (educational packages and the "Prespa" board game)
iii. Translate and adapt programme for citizen scientists to monitor pelican feeding rates, to be developed by SPP, and implement at a transboundary level.
iv. Organise "bat nights" to celebrate and promote bat diversity

DELIVERABLES:

a. **MES/PPNEA**: Pelican feeding rates application translated in Albanian and Macedonian
b. **MES/PPNEA/SPP**: Attendance lists of educational activities

c. **MES/PPNEA/SPP**: Social media materials arising from the above activities (as reported in the annual Press Review)
d. **MES**: Promotional materials to raise awareness and help celebrate "bat night"

Action 2.2.2 Prespa as a field for study – the next conservation generation

i. Young Conservationists Programme
   I. Recruit students to come to Prespa to be trained to do specific work that aligns with ongoing actions by PrespaNet and the Transboundary Strategic Framework
   II. Students carry out studies, often on a transboundary scale and are expected to produce at databases or short reports of the activities they have performed independently
   III. Students gain experience and provide PrespaNet with results that can span beyond those initially envisioned
ii. Ecological Island Field Camps
   I. Bring (post-) graduate students to train under the supervision of renowned ecological experts, particularly in the field of reptile research
   II. Participants provided with connections, monitoring and scientific-writing skills invaluable for their future careers and, importantly, they provide PrespaNet with monitoring databases that are an extension to the programme itself
iii. Transboundary summer schools
   I. Bring together students and recent graduates from across Prespa basin on a week-long training programme in Prespa, on a chosen priority conservation topic, carried out on rotation with each partner hosting annually in turn
iv. Transboundary bird ringing camps
   I. Bringing together prominent ornithologists and young graduates passionate about bird research and conservation in Prespa
v. Survey study on small mammals (AL)

DELIVERABLES:

a. **MES/PPNEA/SPP**: Monitoring databases and reports from young conservationists and students attending ecological field camps
b. **MES/PPNEA/SPP**: Short reports with evaluation forms of transboundary summer schools
c. **PPNEA**: Short report from bird ringing camps
d. **PPNEA**: Small mammals evaluation report
e. **MES/PPNEA/SPP**: Open calls for young conservationists and ecological island field camps
f. **MES/PPNEA/SPP**: Social media materials, including videos, arising from the above activities (as reported in the annual Press Review)

Duration: 3 years

Cost analysis: €59,808.40 (TOTAL all NGOs)

MES total €15,894.22

Travel/meeting costs: €4,087.25; **Personnel:** €3,844.47; **Third party:** €3,750.00; **Equipment:** €1,450.00; **Consumables and other:** €2,762.50

PPNEA total €8,820

Travel/meeting costs: €2,855; **Third party:** €1,177.50; **Consumables and other:** €4,787.50

SPP total €35,094.18

Travel/meeting costs: €12,400; **Personnel:** €15,534.18; **Third party:** €6,000; **Equipment:** €200; **Consumables and other:** €960

STRATEGY 3: ON THE FRONTLINE – COMBATING PRIORITY THREATS

The landscape approach has become essential in ecological conservation, because it allows for a holistic understanding of the environment. Namely, by considering the entire landscape and the various ecosystems within it, we can better understand the interdependencies and interactions between different species, humans included, and their habitats; importantly, through understanding the interdependencies we can understand the wider scope of potential threats. This allows for more effective conservation efforts that take into account both biodiversity and human wellness. And importantly, related to Prespa, this approach will identify shared interests and disagreements across borders concerning conservation actions, conservation priorities and preferences for landscape management.

Identifying landscapes also means recognising areas where local communities are dependent on ecosystems or are even in conflict. Both interactions can exacerbate conservation threats, and as they often vary in form and intensity between the three countries, PrespaNet will invest in acquiring and exchanging transboundary knowledge on threats with wide but not fully understood scopes in Prespa, such as the development of renewable energy sources (RES) and wildlife crime. Documenting their actual and potential impacts will offer tangible material that can be communicated with relevant stakeholders and in turn help governments create and enforce regulations that guide development and human attitudes in Prespa, with conservation in mind.

STRATEGY 3 OBJECTIVES:

NOTE: objectives relate to the strategy as a whole and not to particular components and/or activities.

OBJ-H – Identify and document threats to key values of Prespa to promote effective conservation
OBJ-I – Engage in advocacy and outreach initiatives to mitigate identified threats and safeguard the transboundary Prespa region

3.1: Threats to Prespa at a landscape scale

Transboundary Prespa: Albania, Greece, North Macedonia

Background/problem analysis:

Conservation initiatives and management strategies aim to reconcile the imperative for biodiversity preservation and nature protection with humanity's striving for development and economic advancement. Landscape valuation is a multidimensional approach that seeks to strike a balance between commonalities and conflicts in perceived value of our natural environment as a tool to communicate conservation goals, foster sustainable practices and promote inclusive decision-making in the management of landscapes. The approach integrates ecological functionality, perceived benefits from nature and management preferences to reflect the diverse ways in which people interact with and appreciate natural environments.

This integrated approach balances ecological conservation with human needs and aspirations and provides a comprehensive understanding of the value assigned to landscapes. Landscape valuation provides tools for navigating the interplay between elements that unite stakeholders, like a shared

appreciation for ecosystem services and cultural significance, and elements that may lead to disagreements, such as competing visions for landscape management. Finding a balance between these elements is crucial for fostering sustainable, inclusive and effective conservation practices and informed decision-making in the management of landscapes.

In the Greek part of Prespa, a recent effort on landscape evaluation has centred on the identification of perceived landscape values and threats based on participatory processes and the identification of landscape typology leading to landscape management proposals; these could complement a transboundary approach to landscape valuation.

Aim/s:

The aims of this action address **OBJ-H**, helping us to understand the wider scope of potential threats:

- Assess socio-economic and cultural variations in peoples' perceptions of ecosystem service provision and the functionality attributed to diverse landscapes within the transboundary Prespa Basin
- Identify shared interests and disagreements across borders concerning conservation actions, conservation priorities and preferences for landscape management
- Provide a baseline for informed decision-making towards sustainable, inclusive and effective management of the Prespa Basin

***Expected results of these actions*:**

a. Raised awareness among relevant stakeholders of Prespa's landscape diversity
b. Gained insight into the underlying environmental motives and behaviours of people and their personal ties to surrounding landscape scenery
c. PrespaNet better prepared to combat landscape level threats i.e. to protect Prespa as a whole by prioritising actions that promote the most optimal ratio of biodiversity conservation to human well-being (including economic growth)

Description of actions, activities and deliverables:

Action 3.1.1 Landscape characterisation and assessment – pinpointing vulnerable features and places

i. Review available data on landscape character assessment in the transboundary area of the Prespa basin
ii. Align methodological approach
iii. Conduct fieldwork to assess landscape attributes in Prespa basin, including the whole of Galičica National Park
iv. Hold co-ordination meeting to present and agree on the final output

DELIVERABLES:

a. **MES**: Report on landscape diversity of Prespa basin, including Galičica National Park – a quantitative assessment (composition, structure and landscape visual quality)

Action 3.1.2 Assess socio-economic and cultural variations in perceptions of ecosystem service provision and landscape functionality in the transboundary Prespa basin

i. Determine data sample, site locations and agree on best approach for conducting the perceptual quantitative survey research
ii. Transboundary meetings to ensure participative approach in creating and adapting questionnaire contents
iii. Carry out perceptual quantitative survey
iv. Analyse and interpret data in order to identify commonalities and divergences in perceived landscape functionality, perceived benefits, preferences on landscape management and landscape change

DELIVERABLES:

a. **MES**: Report on cross-border commonalities and divergences in landscape valuation and peoples' preferences for landscape management to inform transboundary communication policy and practice, particularly in relation to landscape-scale threats - perceptual quantitative survey research

Action 3.1.3 Share results and identify common conservation practices and management actions in transboundary Prespa

i. Simplify and summarise results
ii. Communicate results with main stakeholders and policy-makers in the region

DELIVERABLES:

a. **MES (with PPNEA/SPP):** Layman's report to communicate Prespa's landscape diversity and management recommendations

Duration: 3 years

Cost analysis: €8,978.15 (TOTAL all NGOs)

MES total €6,750.45
Travel/meeting costs: €76.75; **Personnel:** €433.95; **Third party:** €5,152.50; **Equipment:** €262.50; **Consumables and other:** €824.75

PPNEA total €500
Consumables and other: €500

SPP total €1,727.70
Personnel: €1,727.70

3.2: Spotlight on priority threats

Transboundary Prespa: Albania, Greece, North Macedonia

Background/problem analysis:
Human interactions with ecosystems can shape landscapes by (over-) using their services or through enduring conflict. Both can result in increasing threats and in the context of Prespa the partners will place the spotlight on two in particular - wildlife crime and development of renewable energy sources (RES) and related road infrastructure (RI). In the Transboundary Strategic Framework (TSF) both are included in the 15 identified priority threats to Prespa. Knowledge on their impact varies significantly between countries, but when it comes to the basin as a whole they are not well understood. We aim to fill this gap, striving to eventually help government bodies establish early warning systems and ensure timely intervention for the prevention of illegal activities and protection of endangered or otherwise important species, habitats and sites.

On the threat of wildlife crime, the TSF identifies that: (i) "there has been no quantitative assessment of the extent or severity of illegal fishing in the Prespa basin, but it is indisputable that the phenomenon is widespread in all three countries", and (ii) "there has been as yet no comprehensive scientific estimate

of the extent of either hunting or poisoning in the area". The lack of comprehensive data from rural and national surveys perpetuates the issue, necessitating field research and improved national and transboundary co-ordination so as to begin to tackle the problem.

In addition, the increasingly evident climate crisis is accompanied by a proportionate augmentation of RES infrastructure worldwide, as the production of energy from carbon sources is being phased out. However, the three main RES (solar power, wind power and hydropower) are being developed on land surfaces and natural systems that maintain natural ecological functions and biodiversity. Moreover, this development often takes place in remote and undisturbed places that do not have the required road infrastructure. Consequently, opening of forest roads in such places should follow proper planning and be under strict regulation, in order to safeguard important biodiversity, crucial habitats and ecological corridors, or even prevent straightforward killing of rare protected species through illegal hunting. In the wider Prespa area and contiguous territories in each of the 3 littoral countries the development of RES follows a different pace. In Greece, wind farms are being increasingly constructed on mountain ridges and have already caused pelican mortalities during the birds' long-distance flights from and to their Prespa colony. In North Macedonia, hydropower plants have been constructed with negative impacts throughout the country as well as in Prespa, while in both Albania and North Macedonia photovoltaic installations are increasingly occupying large territories in the vicinity of the Prespa basin.

Aim/s:

PrespaNet will strive to produce materials and platforms that will eventually help government bodies establish early warning systems and ensure timely intervention for the prevention of illegal activities and protection of endangered or otherwise important species, habitats and sites.

The initiative to fight wildlife crime aims to identify, comprehend and document biodiversity threats in the Prespa area through a comprehensive assessment of illegal hunting and fishing practices, which will also explore community and stakeholder perspectives to provide valuable insights. Initially, MES will build upon the outcomes of the regional Balkan Detox LIFE project (LIFE19 GIE/NL/001016) it is coordinating, such as established national capabilities and networks in fighting wildlife crime and raised awareness among crucial national stakeholders. We aim to further enhance national capacities in addressing these issues, specifically in the Prespa region, and ultimately, establish the groundwork for a transboundary platform.

The activity regarding RES development aims to critically assess the relevant law and policy framework in the three countries and any restrictions in place, identify the biodiversity and other important values that are endangered by the construction and operation of such infrastructure within Prespa and along the important ecological corridors beyond, and formulate and promote a joint NGO position on the issue that will work towards safeguarding the integrity of the protected assets of the area.

Both activities address **OBJ-I**, aiming to engage in advocacy and outreach for the benefit of transboundary Prespa in the face of threats, particularly its protected areas.

***Expected results of these actions*:**

a. Raised awareness amongst local law enforcement and public prosecutors on illegal hunting and fishing activities (MKD)
b. Better preparedness of relevant local institutions to tackle incidents of wildlife crime in Prespa (MKD)
c. Transboundary networking initiative to prevent and fight wildlife crime in Prespa, specifically for the purpose of harmonising knowledge, raising awareness and co-ordinating transboundary initiatives to address this issue collectively
d. Changed attitudes amongst local communities (and beyond through wider communication) in the three countries on RES development, through awareness of the threats it poses to biodiversity in Prespa and its landscapes

e. Understanding of the current state of RES development in the three countries and its potential for endangering biodiversity in Prespa at transboundary level, raising awareness on the dangers and influencing policy decisions on the three sides of the basin

Description of actions, activities and deliverables:

Action 3.2.1 Identify, comprehend and document biodiversity threats in the Prespa area through a comprehensive assessment of illegal hunting and fishing practices

i. Field research to engage with local communities and relevant national institutions (inspectorates, national parks, and law enforcement) to gather data on stakeholder perceptions regarding illegal hunting and fishing practices in Prespa in North Macedonia (questionnaires)
ii. Analyses of pertinent national (MKD) legislation and existing literature on wildlife crime
iii. Organise meetings and educational workshops with key national (MKD) stakeholders, local law enforcement and public prosecutors to foster discussions on bolstering efforts to combat illegal wildlife killing and unsustainable fishing practices in the region, and to implement more effective preventative measures
iv. Initiate transboundary networking for the purpose of harmonising knowledge and co-ordinating regional initiatives to address this issue collectively

DELIVERABLES:

a. **MES**: Comprehensive report on stakeholder perceptions regarding illegal hunting and fishing practices in Macedonian Prespa, including analyses of pertinent national legislation and existing literature

Action 3.2.2 Critical review of the relevant law and policy framework in the three countries and the specific restrictions that are in place, or are lacking, to limit the negative impacts of RES infrastructure on biodiversity and protected areas

i. Identify priority threats to biodiversity and other important values, e.g. the landscape, from the construction and operation of RES infrastructure within Prespa and along important ecological corridors beyond, on the basis of existing scientific knowledge and data
ii. Formulate a joint position of the partners on the issue, which will possibly include proposed exclusion areas per type of RES or other measures needed to safeguard the integrity of the protected assets of the area
iii. Wide communication of the joint policy to the general public and the authorities in the three countries

DELIVERABLES:

a. **SPP (with MES/PPNEA)**: Digital volume: PrespaNet policy position on RES development in the wider Prespa area in English and national languages

Duration: Three years

Cost analysis: €17,395.35 (TOTAL all NGOs)

MES total €2,389.92

Travel/meeting costs: €768.75; **Personnel:** €1,058.67; **Third party:** €150; **Consumables and other:** €412.50

PPNEA total €1,775

Travel/meeting costs: €275; **Third party:** €1,500

SPP total €13,230.43

Personnel: €12,230.43; **Third party:** €1,000

STRATEGY 4: LISTEN AND SHARE – REINFORCING LOCAL ENGAGEMENT

The establishment of the MES and PPNEA local offices were significant milestones in achieving our goal of amplifying the organisations' footprint in the area. The offices play a vital role in bridging conservation concerns with the local community and fostering effective collaboration with stakeholders at both national and international transboundary levels. They also serve as educational hubs, while providing a base for actively engaging in conservation measures and overseeing the implementation of various national and transboundary activities. The offices signify the network's enduring dedication to the region, serving as an indicator of our sustained presence and commitment, and standing in antithesis to the kind of transient project-based approach that the area has historically suffered from.

In light of the fact that the lakes basin is shared by three countries, transboundary collaboration has long been acknowledged to be an essential ingredient of conservation work in Prespa. The need for such collaboration led to the formation of PrespaNet and this co-operation is a key constituent of the partners' work, in recognition of its identification as one of three over-arching factors that have been acknowledged to be fundamental to the successful implementation of the Transboundary Strategic Framework (TSF p.63), the other two factors being raised capacity of the NGO sector and transboundary research supporting conservation efforts (TSF p.77).

STRATEGY 4 OBJECTIVES:

NOTE: objectives relate to the strategy as a whole and not to particular components and/or activities.

OBJ-J – Transboundary co-operation strengthens the network partnership and raises the capacity of the NGO sector in Prespa
OBJ-K – Sustain the operations of local offices to ensure efficient national and transboundary co-ordination for conservation, research, monitoring, education, and participatory activities
OBJ-L – Reassure local communities of the network's long-term and steadfast commitment to the region

4.1: Conversations, co-operation and connections

Transboundary Prespa: Albania, Greece, North Macedonia

Background/problem analysis:

The Prespa region has suffered historically from waves of short-term, project based conservation efforts that have left local communities mistrustful of the value of nature protection to their well-being and, as a consequence biodiversity conservation has been low on the agenda in the past. The area is isolated politically and geographically, and local authorities often struggle with issues of capacity and resources, compounding the low priority assigned to nature protection.

In this context, the network's efforts to strengthen their cross-border co-operation and bring nature conservation to the centre of the regional conversation were given a significant boost in previous PrespaNet projects supported by PONT, the Aage V. Jensen Charity Foundation and EuroNatur, with the establishment of local offices by MES and PPNEA in Prespa in North Macedonia in 2018 and Albania in 2020 respectively. These offices, and the associated increased presence and focus of the partners in the

region, have already paid off in terms of strengthened focus on and collaboration for nature, both nationally, with protected area managers, and at a transboundary level. It is clear that this cross-border co-operation should be maintained and continue to be strengthened in order to support protected area authorities, contribute to protecting biodiversity, habitats and landscapes, and engage local stakeholders and communities in nature conservation, particularly in the face of climate change effects in the region.

This decentralised approach enhances community engagement and collaboration, ensuring that conservation efforts are more attuned to the unique challenges and opportunities present in each local context. The establishment of these offices, coupled with heightened partner engagement in the region, has yielded tangible benefits. As an example, on top of conservation actions and research-based recommendations, a recent national public survey in North Macedonia revealed that Prespa is the region where MES' work is by far the most recognised and supported by locals, a factor underwriting the organisation's expansion into a second office premises in the area in 2024. In practical terms, the local offices also play a crucial role by serving as platforms for the network's collective efforts and acting as central hubs for the efficient co-ordination of various transboundary activities.

Aim/s:

This strategy aims to achieve objectives **OBJ-J** and **OBJ-K** by continuing to strengthen the partners' transboundary collaboration, through working closely together on the conservation, research, monitoring, education and participatory activities described above. The partners will continue to share experience across their particular areas of expertise, foster dialogue and co-operation between stakeholders at transboundary level and further strengthen the NGO sector in the region.

This commitment also aligns with the pursuit of objective **OBJ-L**, as the readily identifiable physical presence and operation of the partners in the region, made manifest in local 'bricks and mortar' and permanent local staff dedicated to Prespa, are a clear statement of long-term and reliable partnership for local communities and conservation stakeholders.

***Expected results of these actions*:**

a. Improved local and national communications, with an increased focus on and relevance to Prespa
b. Heightened awareness of the key role of PrespaNet and partners in the conservation of the Prespa region
c. Strengthened transboundary collaboration between the network partners, as well as other transboundary stakeholders as appropriate to the actions described above
d. Greater recognition of Prespa's natural and cultural values and their significance for human well-being in the region

Description of actions, activities and deliverables:

Action 4.1.1 Communication is key

i. The partners will work together to develop a project communications plan, according to its defined priorities and the resources at its disposal
ii. Adhering to the agreed principles in the plan the partners will continue to manage and maintain their wide variety of communications activities, events and strong online presence

DELIVERABLES:

a. **MES**: Communications plan
b. **MES/PPNEA/SPP**: Wide variety of both digital and non-digital/physical communications material, as set out in the communications plan to be developed in this action

Action 4.1.2 Transboundary collaboration

i. These activities include at least one annual in-person organisation-wide meeting, including the project kick-off meeting, as well as additional in-person meetings of the local officers and project managers to oversee and manage project implementation

ii. In-person meetings will be supplemented by regular thematic and project-wide online meetings as required
iii. The partners will also carry out the preparatory work needed to adapt the strategic framework within which they work to the ever-evident climate crisis era

DELIVERABLES:

a. **MES/PPNEA/SPP**: Minutes of in-person annual trilateral meetings by host organisation

Action 4.1.3 Sustain the function of the local offices

i. Host regular and ad-hoc meetings with locals, students, protected area authorities, transboundary partners and all other relevant environmental actors and other stakeholders
ii. Maintain a visible and tangible presence in the region through permanent staffing of local offices
iii. Provide space for preparatory activities for research, monitoring and education
iv. Provide space for safekeeping of equipment and archives

DELIVERABLES:

a) **MES/PPNEA**: Attendance lists of numerous local office events (education and meetings)
b) **MES/PPNEA**: Local office rental contracts and local staff contracts and/or timesheets

Duration: 3 years

Cost analysis: €90,048.27 (TOTAL all NGOs)

MES total €35,345.32
Personnel: €25,595.32; **Third party:** €1,110; **Consumables and other:** €8,640

PPNEA total €37,106.20
Travel/meeting costs: €5,630; **Personnel:** €19,051.20; **Third party:** €4,250; **Equipment:** €500; **Consumables and other:** €7,675

SPP total €17,596.75
Travel/meeting costs: €950; **Personnel:** €16,646.75

PROGRAMME SUPPORT

Transboundary Prespa: Albania, Greece, North Macedonia

This section of the project proposal focuses on core overall support to the specific activities described above. Project management will ensure the smooth operation of the activities, as well as their correct administration and financial management. Project reporting and accountability also falls under this action.

In addition, funds made available from PONT aim to support greater organisational development for both MES and PPNEA, in order to invest in the overall strategic progress of the two organisations.

PROGRAMME SUPPORT OBJECTIVES:

NOTE: objectives relate to the strategy as a whole and not to particular components and/or activities.

OBJ-M – The project actions are completed on budget and on time
OBJ-N – Improve the overall effectiveness and performance of the network

5.1: Smooth operations and institutional growth

Transboundary Prespa: Albania, Greece, North Macedonia

Background/problem analysis:
While great strides have been made in the development of the organisational capacity behind the local offices and their staff in Prespa, it is also recognised that further progress could be made in order to

increase the effectiveness and impact of their conservation efforts. PPNEA, for example, have recently expanded their staff at a national level, reflecting a commitment to new areas of activity, including lobbying, advocacy, connectivity and governance. However, the NGO acknowledges that their organisational structure has not kept pace with this growth, posing challenges in organisational and management capacities, internal financial management and core staff training. Meanwhile, MES are expanding their local office infrastructure and capacity in Prespa, as noted above, and are also increasing staff recruitment for the region, whilst also anticipating additional capacity requirements for possible additional projects in the region.

In light of the above, PONT has offered both organisations a strand of 'unrestricted' funding to address these needs, offering an exceptional opportunity for them to help their employees to grow and invest in the strategic process. The funds will also facilitate capacity building in organisational and project management skills.

Aim/s:

Objective **OBJ-M** focuses on the successful implementation of the project as the tool for achieving its objectives. The activities related to the maintenance and development of the local offices in Albania and North Macedonia, and project management on all three sides, as well as by project grant manager EuroNatur, will ensure the smooth management and administration of the project, as well as its technical and financial efficacy.

The partners aim to achieve **OBJ-N** through strengthening core competencies in local office staff in Prespa in Albania and North Macedonia, as well as investing in the organisational development in these organisations as a whole, boosting the institutional support infrastructure behind the Prespa focal points. This will support increased autonomy in the local offices, with PPNEA in particular envisaging its young local personnel transitioning from a co-ordinating role to a more direct implementation function. Initiatives have been made in this direction, starting with local staff on the Albanian side independently shouldering responsibilities for monitoring birds and mammal species at the local level, with ongoing participation in field training conducted by experts from the main Tirana office.

***Expected results of these actions*:**

a. Project managed as planned; completed on time and within budget
b. Increase capacities of local and wider NGO staff in project and financial management
c. Increase and develop in-house expertise
d. Support capacity development for conservation implementation in local office staff (AL)

Description of actions, activities and deliverables:

Action 5.1.1 Project management

i. Internal project management at each organisation required to fulfil all of the actions within the project, including the work of the project managers, local office staff, financial and accounting staff, and overheads, as well as the support of senior staff in overall management, planning, strategic direction and decision-making
ii. Grant management of the project by EuroNatur, including contracting and receipt/approval of annual technical and financial reports on behalf of the Aage V. Jensen Charity Foundation, is also included within these activities

DELIVERABLES:

a. **MES/PPNEA/SPP:** Annual project work-plans, against which progress can be measured
b. **MES/PPNEA/SPP:** Annual project technical and financial reports from each organisation

Action 5.1.2 Organisational development

i. Develop capacity for adaptive and effective organisational management in PPNEA and MES, further contributing to balancing out the capacities between the partners.
ii. Carry out relevant staff training

DELIVERABLES:

a. **MES/PPNEA:** Related sections in annual project technical and financial reports
b. **MES/PPNEA:** Staff training certificates, where appropriate

Duration: 3 years – 01/02/2024-31/01/2027 (MES/PPNEA) and 01/03/2023-28/02/2027 (SPP)

Cost analysis: €115,650.46 (TOTAL all NGOs)

MES total €44,748.96

Travel/meeting costs: €6,446.25; **Personnel:** €18,963.96**; Third party:** €6,446.25; **Equipment:** €6,446.25; **Consumables and other:** €6,446.25

PPNEA total €35,867.35

Personnel: €24,218.10; **Equipment:** €4,440.10; **Consumables and other:** €7,209.15

SPP total €19,959.15

Travel/meeting costs: €3,000; **Personnel:** €16,959.15

EuroNatur total €15,075

Travel/meeting costs: €1,500; **Personnel:** €15,075; **Consumables and other:** €750

BUDGET TABLES

SUMMARY TABLE OF COSTS per action per year (TOTAL all NGOs)

Activity	Year 1	Year 2	Year 3	Total
STRATEGY 1: WATER AND WETLAND LANDSCAPE CONSERVATION				
1.1: Water resources: interpreting varying effects of climate change and water management on wetlands, waterbirds and livelihoods				
1.1.1 Organise existing scientific knowledge on water resources	€13,679.31	€19,881.52	€2,508.17	**€36,069.00**
1.2: Wetlands and waterbirds: thinking across borders for conservation in changing conditions under climate change impacts				
1.2.1 Understanding waterbird trends and wetland use, informing conservation action	€27,041.92	€17,040.93	€14,717.17	**€58,800.01**
1.2.2 Deepen scientific understanding of how Prespa wetland reconfiguration is taking place	€1,578.09	€476.50	€58.50	**€2,113.09**
1.2.3 Conservation of wetlands in dynamically changing conditions	€11,129.57	€10,751.21	€9,982.59	**€31,863.37**
1.2.4 Cross-border co-ordination of wetland conservation actions	€5,062.55	€2,960.68	€3,311.18	**€11,334.41**
STRATEGY 2: CONSOLIDATING PRESPA CONSERVATION INTERESTS				
2.1: Capacity building through wildlife monitoring				
2.1.1 Support protected areas and PrespaNet partners in wildlife monitoring	€2,875.16	€4,019.32	€3,739.53	**€10,634.00**
2.1.2 Monitoring+ – following up on what's been learned	€6,600.26	€3,062.75	€4,214.18	**€13,877.19**
2.1.3 Wildlife byways – Prespa in geographical context	€1,759.61	€898.73	€898.73	**€3,557.07**
2.2: Prespa Field Laboratory				
2.2.1 Wild side of Prespa – wildlife inspiration and nature connection for environmental behaviour change	€3,573.41	€3,805.56	€3,091.46	**€10,470.43**
2.2.2 Prespa as a field for study – the next conservation generation	€13,939.92	€24,247.34	€11,150.71	**€49,337.97**
STRATEGY 3: ON THE FRONTLINE – COMBATING PRIORITY THREATS				
3.1: Threats to Prespa at a landscape scale				
3.1.1 Landscape characterisation and assessment – pinpointing vulnerable features and places	€2,002.99	€3,759.06	€3,216.10	**€8,978.15**
3.2: Spotlight on priority threats				
3.2.1 Paving the way towards fighting wildlife crime in Prespa	€1,045.88	€628.26	€1,830.52	**€3,504.66**
3.2.2 Against the impacts of unsustainable energy installations	€542.53	€4,838.81	€8,509.35	**€13,890.69**
STRATEGY 4: LISTEN AND SHARE: REINFORCING LOCAL ENGAGEMENT				
4.1: Conversations, co-operation and connections				
4.1.1 Communication is key	€6,481.65	€8,509.56	€7,980.34	**€22,971.55**
4.1.2 Transboundary collaboration	€2,966.49	€3,008.91	€6,579.78	**€12,555.18**
4.1.3 Sustain the function of the local offices	€18,013.79	€18,012.63	€18,495.13	**€54,521.54**
PROGRAMME SUPPORT				
5.1: Smooth operations and institutional growth				
5.1.1 Project management	€28,291.86	€23,397.18	€23,399.43	**€75,088.47**
5.1.2 Organisational development	€11,820.38	€14,796.99	€13,944.64	**€40,562.01**

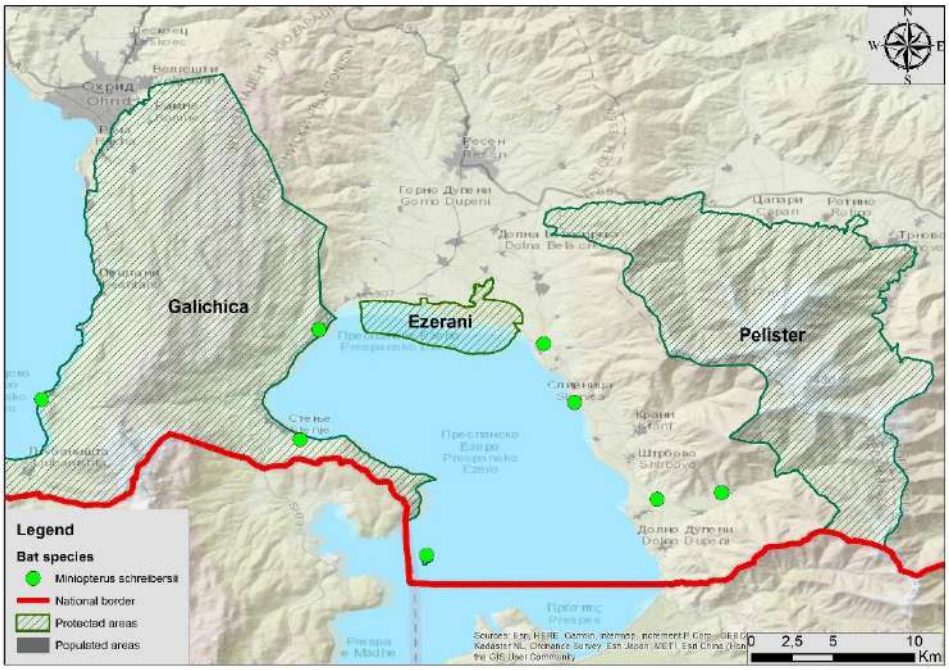
SUMMARY TABLE OF COSTS per action per cost category (TOTAL all NGOs)

Activity	Personnel	3rd Party	Travel	Consumables	Equipment	Total
STRATEGY 1: WATER AND WETLAND LANDSCAPE CONSERVATION						
1.1: Water resources: interpreting varying effects of climate change and water management on wetlands, waterbirds and livelihoods						
1.1.1 Organise existing scientific knowledge on water resources	€17,499.75	€12,200.00	€999.25	€4,270.00	€1,100.00	**€36,069.00**
1.2: Wetlands and waterbirds: thinking across borders for conservation in changing conditions under climate change impacts						
1.2.1 Understanding waterbird trends and wetland use, informing conservation action	€42,437.01	-	€10,868.00	€420.00	€5,075.00	**€58,800.01**
1.2.2 Deepen scientific understanding of how Prespa wetland reconfiguration is taking place	€1,732.09	-	€381.00	-	-	**€2,113.09**
1.2.3 Conservation of wetlands in dynamically changing conditions	€11,115.12	€3,860.00	€5,188.25	€3,075.00	€8,625.00	**€31,863.37**
1.2.4 Cross-border co-ordination of wetland conservation actions	€6,451.66	-	€2,372.75	€1,010.00	€1,500.00	**€11,334.41**
STRATEGY 2: CONSOLIDATING PRESPA CONSERVATION INTERESTS						
2.1: Capacity building through wildlife monitoring						
2.1.1 Support protected areas and PrespaNet partners in wildlife monitoring	€6,380.25	-	€3,258.75	€382.50	€612.50	**€10,634.00**
2.1.2 Monitoring+ – following up on what's been learned	€6,123.69	-	€6,978.50	€150.00	€625.00	**€13,877.19**
2.1.3 Wildlife byways – Prespa in geographical context	€1,682.07	-	€1,875.00	-	-	**€3,557.07**
2.2: Prespa Field Laboratory						
2.2.1 Wild side of Prespa – wildlife inspiration and nature connection for environmental behaviour change	€4,355.18	-	€3,990.25	€2,025.00	€100.00	**€10,470.43**
2.2.2 Prespa as a field for study – the next conservation generation	€15,023.47	€10,927.50	€15,352.00	€6,485.00	€1,550.00	**€49,337.97**
STRATEGY 3: ON THE FRONTLINE – COMBATING PRIORITY THREATS						
3.1: Threats to Prespa at a landscape scale						
3.1.1 Landscape characterisation and assessment – pinpointing vulnerable features and places	€2,161.65	€5,152.50	€76.75	€1,324.75	€262.50	**€8,978.15**
3.2: Spotlight on priority threats						
3.2.1 Paving the way towards fighting wildlife crime in Prespa	€1,898.41	€150.00	€1,043.75	€412.50	-	**€3,504.66**
3.2.2 Against the impacts of unsustainable energy installations	€11,390.69	€2,500.00	-	-	-	**€13,890.69**
STRATEGY 4: LISTEN AND SHARE: REINFORCING LOCAL ENGAGEMENT						
4.1: Conversations, co-operation and connections						
4.1.1 Communication is key	€13,236.55	€5,360.00	€1,300.00	€3,075.00	-	**€22,971.55**
4.1.2 Transboundary collaboration	€10,055.18	-	€1,500.00	€1,000.00	-	**€12,555.18**
4.1.3 Sustain the function of the local offices	€38,001.54	-	€3,780.00	€12,240.00	€500.00	**€54,521.54**
PROGRAMME SUPPORT						
5.1: *Smooth operations and institutional growth*						
5.1.1. Project management	€64,529.91	€0.00	€4,500.00	€6,058.55	€0.00	**€75,088.46**
5.1.2 Organisational development	€8,436.30	€6,446.25	€6,446.25	€8,346.85	€10,886.35	**€40,562.00**

SUMMARY TABLE OF COSTS per action per partner

Activity	EuroNatur	MES	PPNEA	SPP	Total
STRATEGY 1: WATER AND WETLAND LANDSCAPE CONSERVATION					
1.1: Water resources: interpreting varying effects of climate change and water management on wetlands, waterbirds and livelihoods					
1.1.1 Organise existing scientific knowledge on water resources	-	€745.00	€9,576.75	€25,747.25	**€36,069.00**
1.2: Wetlands and waterbirds: thinking across borders for conservation in changing conditions under climate change impacts					
1.2.1 Understanding waterbird trends and wetland use, informing conservation action	-	€12,224.11	€11,178.00	€35,397.90	**€58,800.01**
1.2.2 Deepen scientific understanding of how Prespa wetland reconfiguration is taking place	-	€1,866.24	-	€246.85	**€2,113.09**
1.2.3 Conservation of wetlands in dynamically changing conditions	-	€30,469.81	€875.25	€518.31	**€31,863.37**
1.2.4 Transboundary co-ordination of wetland conservation actions	-	€791.48	€3,677.00	€6,865.93	**€11,334.41**
STRATEGY 2: CONSOLIDATING PRESPA CONSERVATION INTERESTS					
2.1: Capacity building through wildlife monitoring					
2.1.1 Support protected areas and PrespaNet partners in wildlife monitoring	-	€2,055.66	€7,893.20	€685.14	**€10,634.00**
2.1.2 Monitoring+ – following up on what's been learned	-	€11,527.93	€527.50	€1,821.76	**€13,877.19**
2.1.3 Wildlife byways – Prespa in geographical context	-	€2,696.19	-	€860.88	**€3,557.07**
2.2: Prespa Field Laboratory					
2.2.1 Wild side of Prespa – wildlife inspiration and nature connection for environmental behaviour change	-	€3,801.91	€2,000.00	€4,668.52	**€10,470.43**
2.2.2 Prespa as a field for study – the next conservation generation	-	€12,092.31	€6,820.00	€30,425.66	**€49,337.97**
STRATEGY 3: ON THE FRONTLINE – COMBATING PRIORITY THREATS					
3.1: Threats to Prespa at a landscape scale					
3.1.1 Landscape characterisation and assessment – pinpointing priority vulnerable and places	-	€6,750.45	€500.00	€1,727.70	**€8,978.15**
3.2: Spotlight on priority threats					
3.2.1 Paving the way towards fighting wildlife crime in Prespa	-	€2,253.14	€275.00	€976.52	**€3,504.66**
3.2.2 Against the impacts of unsustainable energy installations	-	€136.78	€1,500.00	€12,253.91	**€13,890.69**
STRATEGY 4: LISTEN AND SHARE: REINFORCING LOCAL ENGAGEMENT					
4.1: Conversations, co-operation and connections					
4.1.1 Communication is key	-	€2,782.45	€10,666.20	€9,522.90	**€22,971.55**
4.1.2 Transboundary collaboration	-	€2,931.33	€1,550.00	€8,073.85	**€12,555.18**
4.1.3 Sustain the function of the local offices	-	€29,631.54	€24,890.00	-	**€54,521.54**
PROGRAMME SUPPORT					
5.1: *Smooth operations and institutional growth*					
5.1.1. Project management	€15,075.00	€18,963.97	€21,090.35	€19,959.15	**€75,088.47**
5.1.2 Organisational development	-	€25,785.01	€14,777.00	-	**€40,562.01**

Annex II. Maps with the locations where bat species were recorded on Macedonian side of Prespa


Galichica
Ezerani
Pelister
Legend
Bat species
Miniopterus schreibersii
National border
Protected areas
Populated areas
0 2,5 5 10
Km

Galichica
Ezerani
Pelister
Legend
Bat species
Myotis blythii
National border
Protected areas
Populated areas
0 2,5 5 10
Km

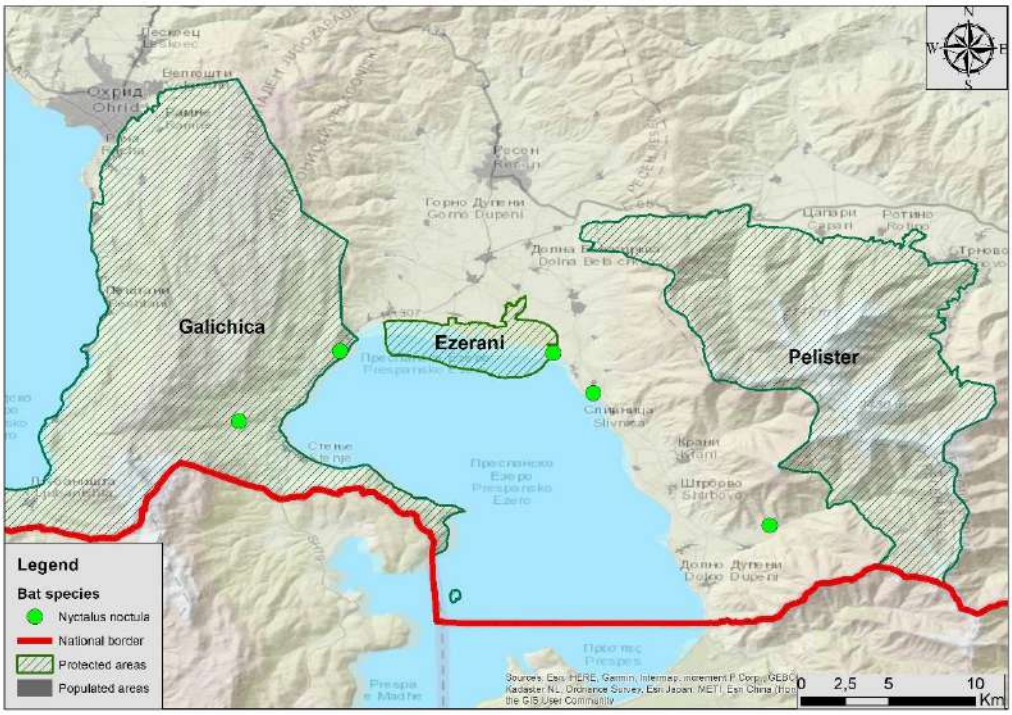
Galichica
Ezerani
Pelister
Legend
Bat species
Myotis capaccinii
National border
Protected areas
Populated areas
0 2,5 5 10
Km

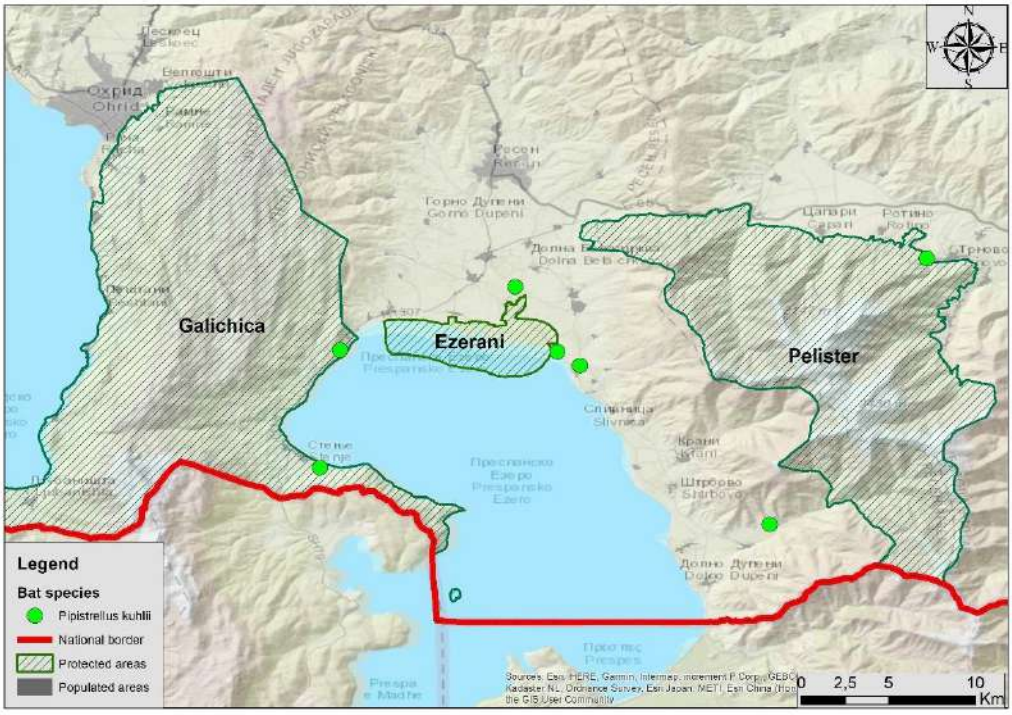
Galichica
Ezerani
Pelister
Legend
Bat species
Myotis emarginatus
National border
Protected areas
Populated areas
0 2,5 5 10
Km

Galichica
Ezerani
Pelister
Legend
Bat species
Myotis myotis
National border
Protected areas
Populated areas
0 2,5 5 10
Km

Galichica
Ezerani
Pelister
Legend
Bat species
Myotis mystacinus
National border
Protected areas
Populated areas
0 2,5 5 10
Km

Galichica
Ezerani
Pelister
Legend
Bat species
Nyctalus leisleri
National border
Protected areas
Populated areas
0 2,5 5 10
Km


Galichica
Ezerani
Pelister
Legend
Bat species
Nyctalus noctula
National border
Protected areas
Populated areas
0 2,5 5 10
Km


Galichica
Ezerani
Pelister
Legend
Bat species
Pipistrellus kuhlii
National border
Protected areas
Populated areas
0 2,5 5 10
Km

Galichica
Ezerani
Pelister
Legend
Bat species
Pipistrellus nathusii
National border
Protected areas
Populated areas
0 2,5 5 10
Km

Galichica
Ezerani
Pelister
Legend
Bat species
Pipistrellus pipistrellus
National border
Protected areas
Populated areas
0 2,5 5 10
Km

Galichica
Ezerani
Pelister
Legend
Bat species
Pipistrellus pygmaeus
National border
Protected areas
Populated areas
0 2,5 5 10
Km

Galichica
Ezerani
Pelister
Legend
Bat species
Plecotus auritus
National border
Protected areas
Populated areas
0 2,5 5 10
Km

Galichica
Ezerani
Pelister
Legend
Bat species
Rhinolophus blasii
National border
Protected areas
Populated areas
0 2,5 5 10
Km

Galichica
Ezerani
Pelister
Legend
Bat species
Rhinolophus euryale
National border
Protected areas
Populated areas
0 2,5 5 10
Km

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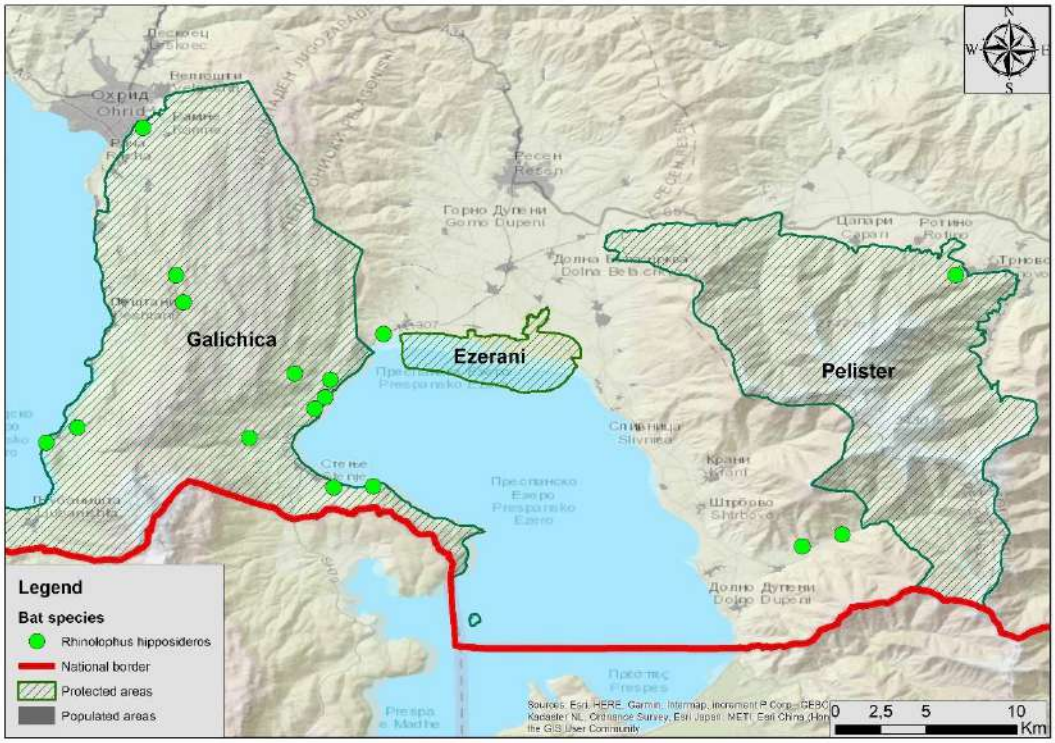
Populated areas
0 2,5 5 10
Km


Galichica
Ezerani
Pelister
Legend
Bat species
Rhinolophus hipposideros
National border
Protected areas
Populated areas
0 2,5 5 10
Km

Galichica
Ezerani
Pelister
Legend
Bat species
Tadarida teniotis
National border
Protected areas
Populated areas
0 2,5 5 10
Km

UNIFIED MONITORING PROTOCOLS
BATS IN PRESPA AREA

14/05/2021

Philippe Théou

Aleksandar Stojanov

A. Transboundary protocol for underground habitats and cave-dwelling bat species monitoring

Visiting potential and known underground roosts used by bats requires the respect of a strict protocol and a pre-field preparation. Bats can use roosts presenting risks for humans, as abandoned buildings, bunkers or caves. Any persons that may be part of field expeditions must be aware about it, and be ready to anticipate any situations and react properly if needed.

I Before the field work - Preparation

1.1 Participants' safety

The first point of this protocol is the safety of the participants, near and inside all the visited locations. All the needed equipment (Tab. 1) must be functional and checked before any expedition. In order to reduce possible issues, it is proposed to always realise expeditions with a **minimum of two persons.** However, it is also better to realise these expeditions with a **maximum of four persons**, in order to reduce as much as possible the disturbance of bats, but also of the whole ecosystem within these stations, especially caves (cave's dwellers and geological jewel).

As a general idea, it is always better to inform persons which are not part of the monitoring team (such as protected areas staff or colleagues) about the daily plan and expected timeframe of the monitoring plan. This will give the possibility to organise first aid support in case of major issues.

Table 1: Safety equipment needed to monitor underground sites

Needed equipment :	
Security	- 1 head-lamp per person. - Additional batteries and spare light - 1 helmet per person - At least one phone fully charged per group - Bottles of water (1L per person) - Dried fruits - Basic first aid kit - If visiting a cave, a full equipment for speleologist must be carried within the group

1.2 Location's safety

1.2.1 Habitat and species

The underground sites visited can host an important biodiversity, in addition to bat species. This includes potential protected species and endemic species extremely sensitive to disturbance such as light, noise, destruction of the habitat but also chemical changes in the composition of the air (increase of CO2, etc.) or the water.

In order to avoid at the maximum such disturbances, it is highly recommended to limit at the maximum the time inside **and nearby** underground sites, as well as not to leave anything inside these sites (waste, etc.). If a dumpsite is observed inside the underground site, it is recommended to collect data on this pollution (pictures) and collect as much as possible of waste.

1.2.2 Diseases

* SARS-CoV-2 (COVID 19)

While finalising this unified monitoring protocols document, the research on the SARS-CoV-2 (COVID 19) is still on-going, and many points are not yet answered by science. However, since June 2020, the IUCN (SSC Bat Specialist Group) formulated several recommendations for bat workers to avoid potential human-bat transmission of the virus (Fig. 1).

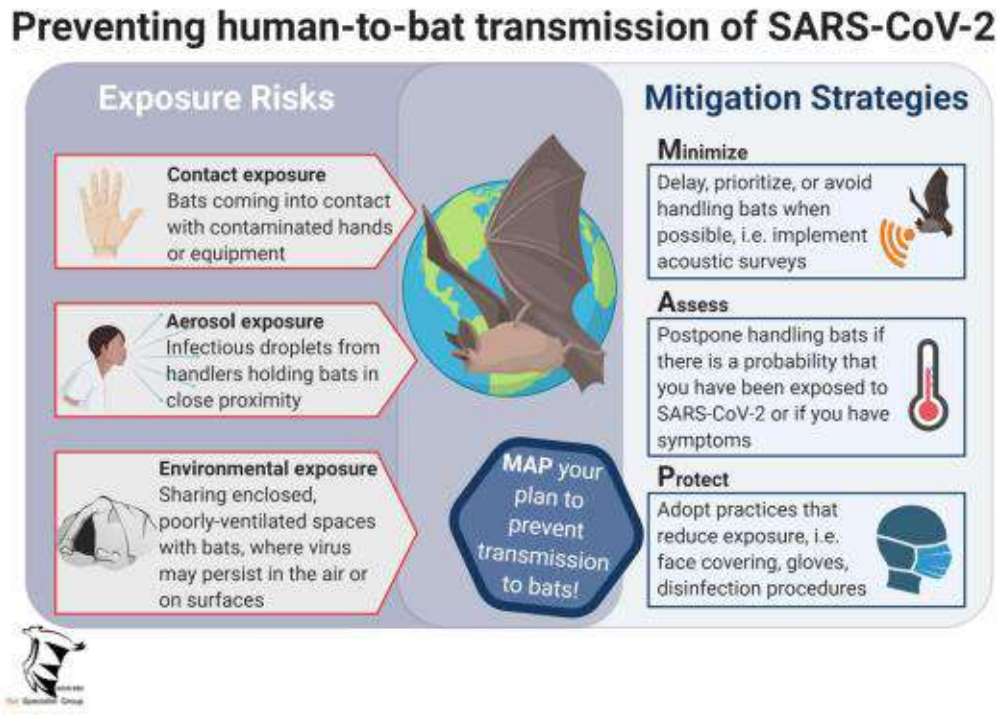


Figure 1 : Preventing human-to-bat transmission of SARS-CoV-2 (IUCN SSC)

Considering the high risk that could represent a human-bat transmission of the virus to local and international bat populations, these recommendations should be strictly implemented in the Prespa area.

1.2.3 Geological aspects

In addition to their biological values, many underground sites are of high geological interest and are protected as such. It is therefore extremely important to not negatively impact these locations on a geological point of view. This includes the importance of not walking over geological features such as stalagmites, be careful not to destroy *stalactites when walking inside and not resting on unstable geological features.*

1.2.4 Archaeological aspects

Underground sites represent also targeted environment for archaeological studies and conservation work. It is therefore extremely important to not manipulate any potential archaeological items when monitoring. In case of potential interesting items observed, it is recommended to take pictures and share them with the authorities in charge in the country. This collaboration is important, as it is giving an opportunity of exchanges between different stakeholders (ecologists & archaeologists) which could lead to a better integration of the different stakeholders' needs and benefit to the general conservation of the habitat and species.

II On the field – Data collection

This monitoring protocol aims to collect information concerning the roost (coordinates, type) and on the use done by bats (presence of bats, indicators, species, number of specimens). Also, collecting information about bats, an assessment of the situation should be done in order to identify possible threats on the site or on the chiropters.

In order to be able to implement the protocol on the field, the following equipment is needed, in addition to the safety equipment (Tab. 2)

Table 2: Monitoring equipment needed to monitor underground sites

Needed equipment :	
Monitoring protocol	- GPS - Additional hand-lamp needed for identification of bats - Camera - Gloves - Plastic boxes for bones collection - Block note

	- Bat detector (if available) - Mist-nets equipment, if needed - Measurement equipment (Calliper, etc.) - Key of identification of European Bats (i.e C.Dietz, 2009)

2.1 Site visits

As previously mentioned, the monitoring team entering the underground sites should be composed by at least 2 members and a maximum of 4 members. More members could be accepted only in specific situations, especially when the underground site visited is extremely large.

Specimens that are directly observed by the monitoring team should be included to the notebook at the moment of the observation, including their number, species identification and potential additional information (cluster, hibernation, juvenile, etc.).

hen important colonies are identified (generally in spring or in winter), or when identification is not sure, a picture can be taken in order to allow a more efficient counting and identification on computer, and also to avoid disturbing the animals.

Once monitoring the site, potential threats on bats but also on the habitat should be listed. These threats can be listed as follow:

Modification of habitat (removal of geological features, increase/decrease of the location entrance, construction inside and/or outside the site, etc.)

Destruction of habitat

Past and/or on-going disturbance of cave dwelling species (fire, bat specimen collection, human activities inside the underground site and/or near the entrance, etc.)

Destruction of species (fire, dead animal, etc.)

2.2 Use of bat detector

The use of a bat detector inside an underground site can support the identification of species. This can be the case for specimens flying inside the site, for specimens located in some inaccessible parts or specimens that cannot be determined only visually (especially middle sized Rhinolophus). It is recommended to use the bat detector with a X10 time expansion and record for a long period, in order to collect the maximum of information from the echolocation calls (such as social calls). The records should be done in different parts of the site, in order to increase the chances to clearly identified all the species using the site during the monitoring.

2.3 Use of Mist-nets

Mist-nets could be installed in front underground sites' entrances to catch bats, and to obtain more information concerning specimens using the sites monitored. It is important to underline that the mist-netting sessions must be realised during periods when bats are less sensitive to disturbance (**not during maternity period**), and following a visit inside the site to identify the number of specimens and species actually using the cave. If the number of specimens observed inside the cave is too high, it is better to not proceed with the use of mist-nets, as the number of caught bats in a short period of time will strongly stress the bats staying in the nets for too long, and potentially destroy the monitoring equipment (mist-nets).

Mist net should be installed only if an experienced expert is part of the monitoring team.

2.4 Collection of bones and indicators

When monitoring underground sites, it is important to search for potential indicators of bat presence during the year. This includes potential carcass of dead bats, bat bones (Fig. 2), chiropterolite (part of the cave that change color due to the past presence of bats) (Fig. 3), guano but also remains of prey, such as wings of butterflies, dragonflies or exoskeleton of various insects. Such indicators should be collected, if possible, or taken in pictures, in order to be identified during the post-field work stage.

The quantity and type of guano recorded in the monitored sites can shed a light on the use of such habitats by bats during the year (Fig.3) . If fresh guano is observed, it means that bats have been using recently the site (last 1 or 2 months), while if dried guano is recorded, the bats used it several months ago, and might use again soon the site following a yearly cycle. Also, the presence of large wings of butterfly and dragonfly could suggest the use by large bat species (Rhinolophus sp. or *Myotis myotis/blythii*)

Figure 2 : Skulls of Myotis myotis

Figure 3: Chiropterolite and guano in a cave

III After the fieldwork – Analyse & Database

3.1 Counting with picture

To realise the counting, a grid can be added to the picture taken on the field, using the GIMP free-software (Fig.4). The number of specimens per square is manually counted in several squares, and an average of specimens per square is obtained. Then, all the squares full of bats can be counted, and the number of squares be multiplied by the average of bats per square. The remaining bats are counted manually and added to the total amount.

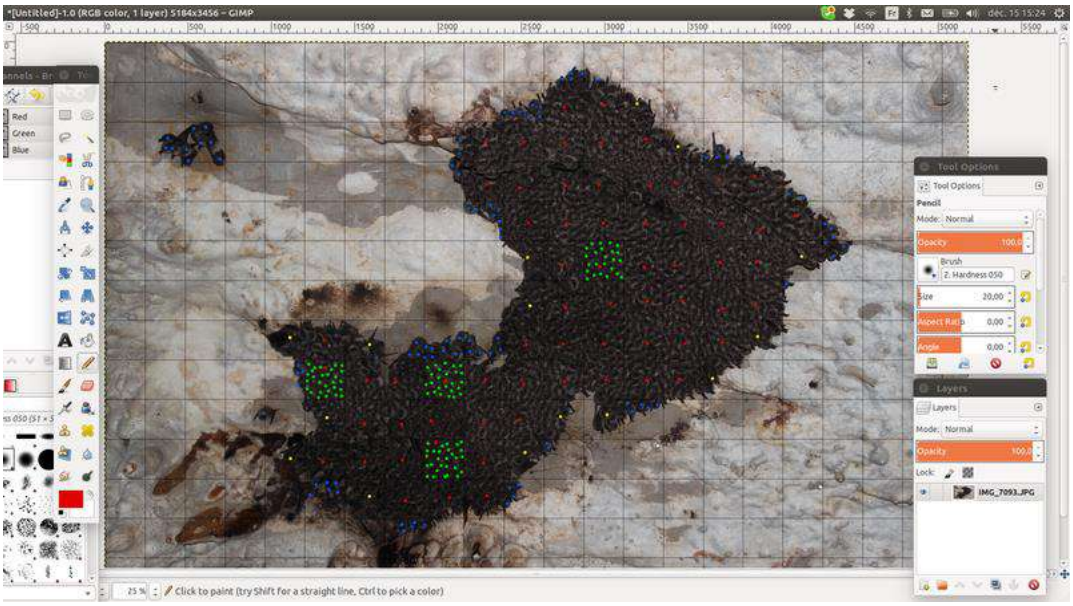


Figure 4: A colony counted on computer

3.2 Analyse of bat echolocation calls

Echolocation calls recorded inside the underground site should be analysed using a specific software for the bat echolocation calls, such as BatSound from Petterson. The frequency of the calls, the potential presence of social calls, as well as the duration of the calls can allow the identification of a family of bats and often the species.

The identification of bat echolocation calls requires some experience for the identification of species and should not be considered as a unique solution for the identification of all the species using the Prespa area. Many species are very difficult to identified only by bat detector, and require the implementation of others methodologies for a clear identification (capture, DNA analyses, etc.)

3.3 Identification of bat carcass, bones and preys

The identification of bat carcass is generally easy, especially if the specimen is recently dead. The specimen can be easily fully measured and if needed in the case of cryptic species, DNA material can be extracted.

Also, with the use of specific measurement, it is possible to identify bat family but also species from bat some bat bones collected inside the underground sites. Skulls should especially be targeted, as they often allow a good species identification.

If collected from the site, the sample should be left at the competent authorities after identification (Museum of Natural History, Faculty of biology).

3.4 Addition of data into the unified database

After the analyse of all the data collected, the digital database should be updated. It is proposed to have two files using the same template (see part C): one for the Albanian side, and one for the Macedonian side. Both files can be merge at the end of the activity, in order to give the overview of the transboundary cooperation implemented during the project.

B. Transboundary protocol for forest-dwelling bat species monitoring

The implementation of a monitoring protocol targeting bat forest dwelling species requires the respect of a strict protocol and a pre-field preparation. The monitoring protocol is presenting risks for humans, especially due to the location of potential roosts and the fact that monitoring should be done in remote areas during night. Any persons that may be part of field expeditions must be aware about it, and be ready to anticipate any situations and react properly if needed.

I Before the field work - Preparation

1.1 Participants' safety

The first point of this protocol is the safety of the participants, before, during and after the implementation of the monitoring protocol. All the needed equipment (Tab. 3) must be functional and checked before any expedition. In order to reduce possible issues, it is proposed to always realise expeditions with a **minimum of two persons.** There is no limit for the monitoring team size.

As general idea, it is always better to inform persons which are not part of the monitoring team (such as protected areas staff or colleagues) about the daily plan and expected timeframe of the monitoring plan. This will give the possibility to organise first aid support in case of major issues.

Table 3: Safety equipment needed to monitor forest dwelling species

Needed equipment:	
Security	- 1 head-lamp per person. - Additional batteries - 1 helmet per person, if checking for potential roosts in trees - At least one phone fully charged per group - Bottles of water (1L per person) - Dried fruits

1.2 Location's safety

1.2.1 Habitat and species

The sites selected for implementing the protocol can host an important biodiversity, in addition to bat species. It is therefore important to reduce at the maximum potential disturbances, from the place of parking selected (not to damage potential interesting habitat/species), the use of light or the accidental catch of non-targeted animals.

It is important to not leave anything on site after the monitoring (waste, etc.). If a dumpsite is observed on site, it is recommended to collect data on this pollution (pictures) and collect as much as possible of waste.

1.2.2 Diseases

* SARS-CoV-2 (COVID 19)

While finalising this unified monitoring protocols document, the research on the SARS-CoV-2 (COVID 19) is still on-going, and many points are not yet answered by science. However, since June 2020, the IUCN (SSC Bat Specialist Group) formulated several recommendations for bat workers to avoid potential human-bat transmission of the virus (Fig. 5).

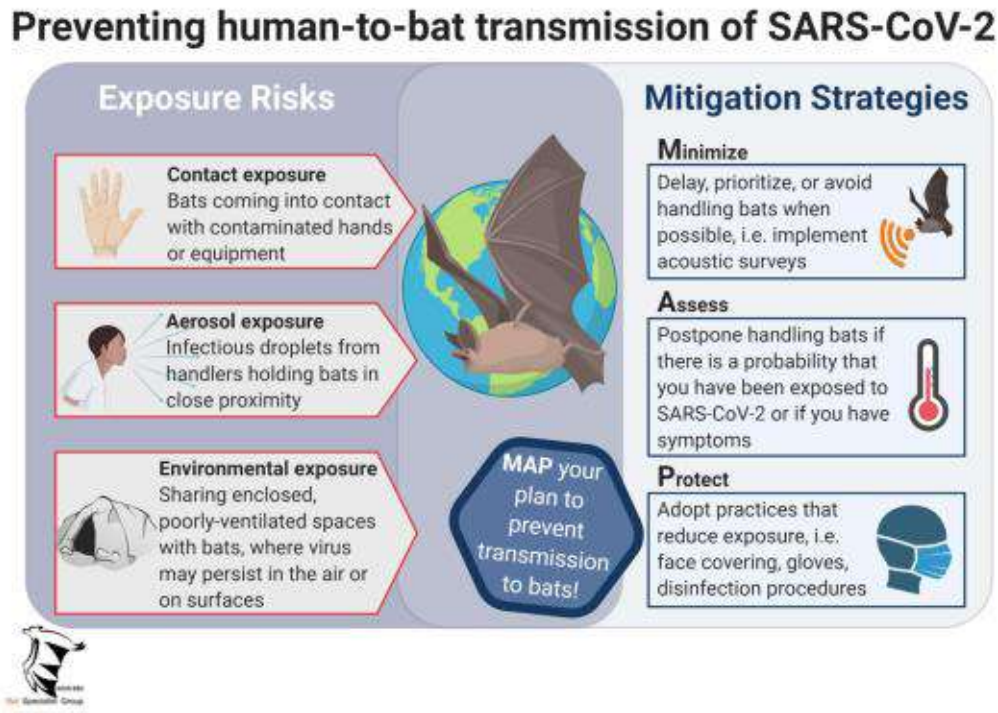


Figure 5: Preventing human-to-bat transmission of SARS-CoV-2 (IUCN SSC)

Considering the high risk that could represent a human-bat transmission of the virus to local and international bat populations, these recommendations should be strictly implemented in the Prespa area.

1.2.3 Private properties

In case of private properties near by the monitoring site, it is important to make sure the access is kept open (road, tracks, etc.). In case, owners of the properties could be informed before the implementation of the activity, if possible, by the protected areas staff.

II On the field – Data collection

This monitoring protocol aims to collect information concerning potential roosts (coordinates) and on the use of the area done by bats (presence of bats, indicators, species, number of specimens). Also, collecting information about bats, an assessment of the situation should be done in order to identify possible threats on the site or on the chiropters.

In order to be able to implement the protocol on the field, the following equipment is needed, in addition to the safety equipment (Tab. 4).

Table 4: Monitoring equipment needed to monitor forest dwelling species

Needed equipment:	
Monitoring protocol	- GPS - Additional hand lamp needed for identification of bats - Camera - Gloves - Block note - Bat detector (passive & active) - Ladder (if possible) - Mist-nets equipment, if needed - Measurement equipment (Calliper, etc.) - Key of identification of European Bats (i.e C.Dietz, 2009)

2.1 Site visits during day time

As previously mentioned, the monitoring team visiting the sites should be composed by at least 2 members.

2.1.1 Search of roost

The first step is the search of potential tree used as roost by bats. Such trees are generally old and present some holes where bats can hide. However, bats can also hide in other part of the tree, and a general inspection of trees should be done. This step could be supported by the deployment of telemetry protocol in the future. Considering the extremely high amount of work that this protocol requires, it is recommended to target only characteristic trees, including isolated trees near agricultural plots.

2.1.2 Bat Boxes

Following the installation of bat boxes in the forest areas of the project, these boxes will have to be monitored at least once per season. This can be made thanks to an appropriate scale, hand lamp and camera. If a bat box is known to be used by bats but the number of specimens cannot be exactly counted, it is recommended to count the bats at sunset, when the animals are leaving the roost. The entrance of the box can be lightened, and if needed, a video camera can be used to ease the counting later on, in case of large amount of specimen.

Specimens that are directly observed by the monitoring team should be included to the note book at the moment of the observation, including their number, species identification and potential additional information (juvenile, etc.).

When important colonies are identified, or when identification is not sure, a picture can be taken in order to allow a more efficient counting and identification on a computer, and also to avoid disturbing the animals.

Once monitoring sites during the day, potential threats on bats but also on the habitat should be listed. These threats can be listed as follow:

Modification of habitat (fire, dumpsite, tracks etc.)

Destruction of habitat (fire, illegal logging, etc.)

Destruction of species (for trees / bat boxes known to be used by bats)

2.2 Use of bat detector

2.2.1 Passive bat detection

In the frame of this project, it is foreseen to install two passive bat detectors in each country in order to collect information regarding bat using forest areas. These passive bat detectors should be installed in areas identified as potentially important for bats.

It is proposed to run at least one recording sessions of five days during each season (excluding winter) and for at least two sectors. The bat detectors should be installed thanks to a scale at an appropriate height on a tree, and removed after five complete nights of recording. It is recommended to install each time the two bat detectors in the same targeted sector, in order to improve the coverage of the monitoring. Once the data collected on a computer and batteries changed, the two bat detectors could be installed in another sector.

2.2.2 Active bat detection

In addition to the passive bat detection, it is proposed if possible, to use active bat detection in the areas where mist-netting sessions are implemented. This will increase the coverage of forest area covered by echolocation recording as well as support the identification of potential species using the targeted area but not caught by mist nets. It is recommended to use the bat detector with a X10 time expansion and record for a long period, in order to collect the maximum of information from the echolocation calls (such as social calls). The records should be done in different parts of the site, in order to increase the chances to clearly identified all the species using the site during the monitoring.

2.3 Use of Mist-nets

The use of mist-nets inside forest areas is very important to understand the use of these habitats by bats, and to record species that cannot be clearly identified by echolocation recording.

In order to increase the chance of catching as many species and specimen possible, it is recommended to carefully select the locations:

near water pond / reservoir / river / stream

near car path if the forest is old enough around

inside potential “tunnel” created by the vegetation

If during the maternity period, a pregnant female and/or a female with a juvenile is caught, it is extremely important to release it as fast as possible. The identification of the species should be the only data to be taken from such specimen, as the stress could lead to the rapid death of the female and/or the juvenile (especially for Rhinolophus sp.).

Mist net should be installed only if an experienced expert is part of the monitoring team.

III After the fieldwork – Analyse & Database

3.1 Analyse of bat echolocation calls

Echolocation calls recorded should be analysed using a specific software for the bat echolocation calls, such as BatSound from Petterson. The frequency of the calls, the potential presence of social calls, as well as the duration of the calls can allow the identification of a family of bats and often the species.

The identification of bat echolocation calls requires some experience for the identification of species and should not be considered as a unique solution for the identification of all the species using the Prespa area. Many species are very difficult to identified only by bat detector, and require the implementation of others methodologies for a clear identification (capture, DNA analyses, etc.)

3.2 Addition of data into the unified database

After the analyse of all the data collected, the digital database should be updated. It is proposed to have two files using the same template (see part C) : one for the Albanian side, and one for the Macedonian side. Both files can be merge at the end of the activity, in order to give the overview of the transboundary cooperation implemented during the project.

C. Data sheet for monitoring protocols

I. Field work data sheet

Country: Date:

Monitoring Team:

Name of Station	Lat	Long	Type	Metho_Obs	Species	Number	Comments

II. Description of the excel data sheet

SITE / STATION	Country	AL (Albania) MK (North Macedonia)
	ID	Each data collected is unique, considering the data, the station and the species recorded, therefore each new line must be linked with a unique ID
	Date	Date of the collection of the data
	Site code	Each station is receiving a unique code. If the station is visited for the first time, a new code should be created. The code must be created as follow : For Albania : ALXXXX (the number must be added following the last number of the national database) For North Macedonia: MKXXXX (the number must be added following the last number of the national database).

		In case of doubt, the site code can be added by the National Coordinator, if the coordinates are available.
	Name of station	If the name of the station is known (for caves or buildings)
	Lat	Coordinates of the station (in WGS 84)
	Long	
	Type station	Cave-Building-Bunker-Tree-Mine-Bridge In case of mist-netting and/or echolocation recording in open space: Open-space
METHODOLOGY	Metho_obs	How the data was collected: Acoustic – Capture – NA – Other - Visual
SPECIES	Species	Latin name of the species identified. For each species, a new row must be filled out. If no species is recorded: None If the species is not clearly identified: Family sp. (i.e Rhinolophus sp.; Pipistrellus sp.; Plecotus sp. ; Myotis sp. Nyctalus sp.) In case of identification with ultrasound records, the potential species can be merge in one group of species (I.e Nyctalus sp. / Eptesicus sp. / Vespertilio sp.; Nyctalus sp. / Teniotis sp.) Unidentified
	Number of specimens	Only one number should be added. If a number is approximated this must be clearly stated in the comment.
	Authors	Names of the persons who collected the data
	Comments	For comments, if any, concerning the station, specimens observed, threats, danger. Also, indicators of bat presence can be underlined here, including bones or skulls of bats (Fig.2), the quantity of guano on the ground, chiropterolite (chemical action of the

		bat urine on cave wall, changing the coloration of it) (Fig.3) and remaining of insect exoskeleton or wings. If specimens are manipulated, the measurement, age, sex can be added in the comments.