



The LifeWatch ERIC Biodiversity & Ecosystem eScience Conference

PLOVDIV, BULGARIA

7-10 JULY 2026



Energy-Efficiency Measures Threaten Important Habitats of Protected Species in Buildings: Evidence from a National Monitoring Study in Bulgaria

Authors: Elena Stoeva, Stoyan Goranov, Miroslav Tonev, Ilyan Stoev, Aleksandar Mechev, Lubomir Yankov, Georgi Dulev, Dilyan Georgiev

Presenter: Elena Stoeva

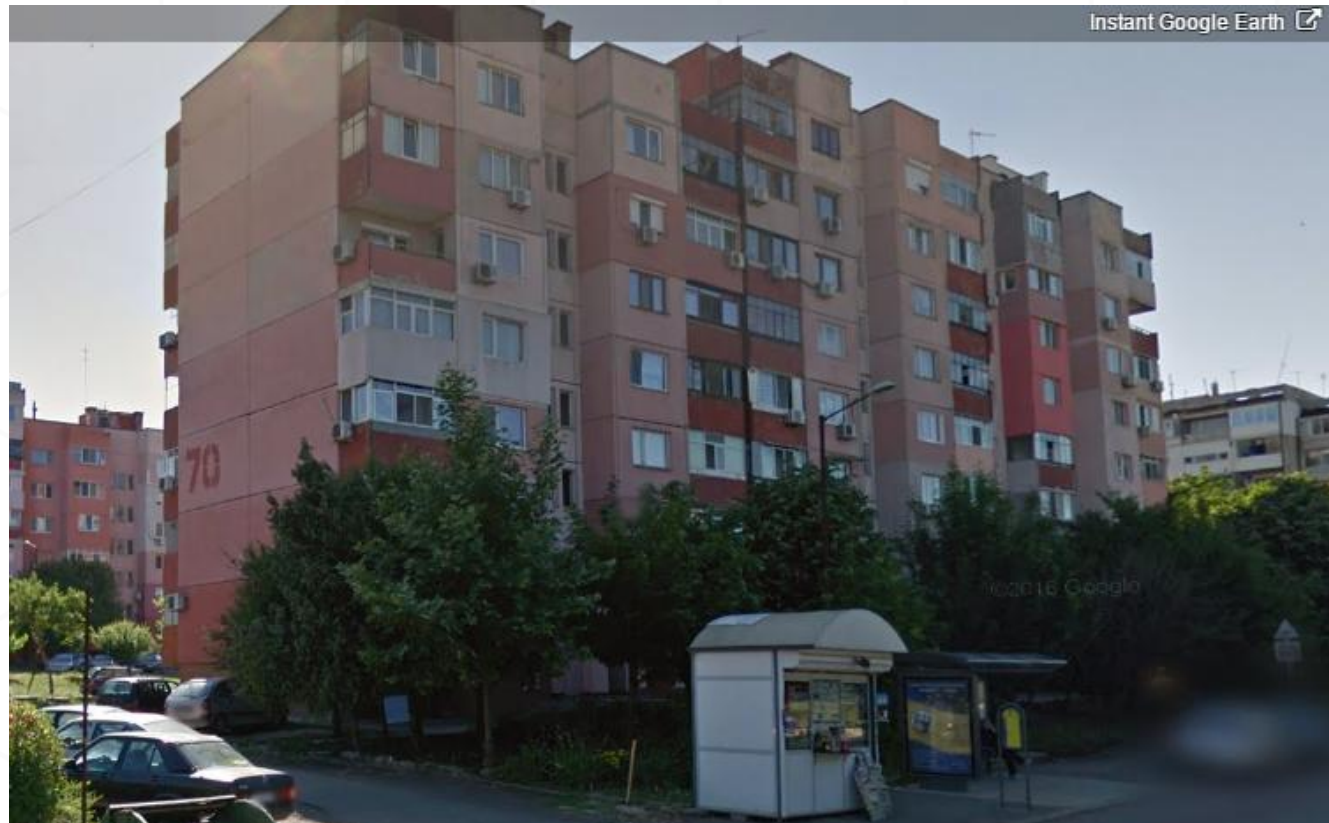


19 JULY 2026

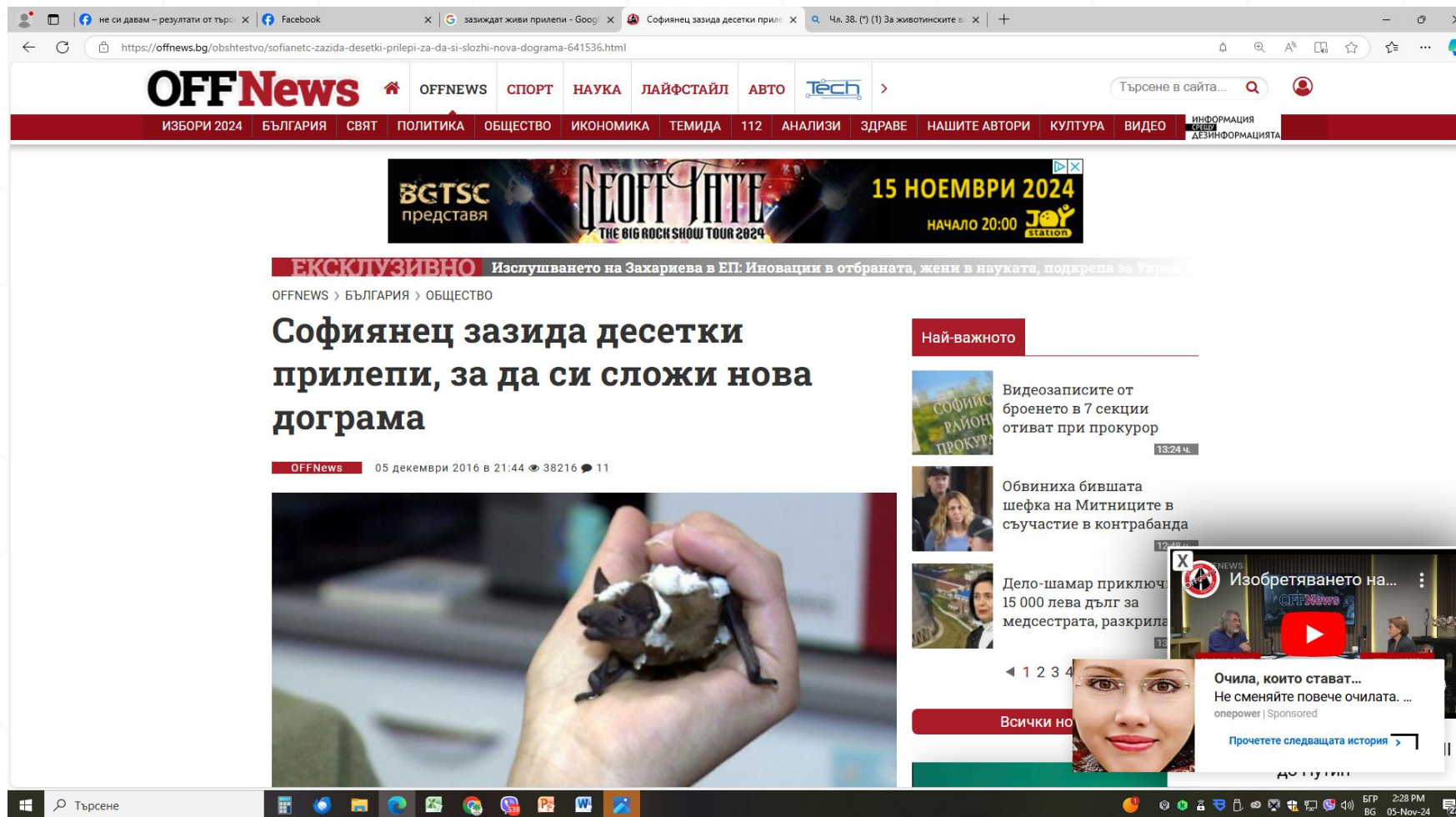
BACKGROUND

2016-2017, Stara Zagora

First public cases of “institutional conflict” following reports of the walling-in of flightless juveniles of protected species



“A Sofia resident walled in dozens of live bats while installing new window frames.”



The screenshot shows the OFFNews website with the following elements:

- Header:** OFFNews logo and navigation menu (OFFNEWS, СПОРТ, НАУКА, ЛАЙФСТАЙЛ, АВТО, Tech).
- Sub-header:** ИЗБОРИ 2024, БЪЛГАРИЯ, СВЯТ, ПОЛИТИКА, ОБЩЕСТВО, ИКОНОМИКА, ТЕМИДА, 112, АНАЛИЗИ, ЗДРАВЕ, НАШИТЕ АВТОРИ, КУЛТУРА, ВИДЕО, ИНФОРМАЦИЯ, ДЕЗИНФОРМАЦИЯТА.
- Banner:** BGTSO представя GEOFF YATTE THE BIG ROCK SHOW TOUR 2024 15 НОЕМВРИ 2024 НАЧАЛО 20:00 JOY station.
- Article Title:** ЕКСКЛУЗИВНО Изслушването на Захаријева в ЕП: Иновации в отбраната, жени в науката, подкрепа за Украйна.
- Article Subtitle:** OFFNEWS > БЪЛГАРИЯ > ОБЩЕСТВО
- Article Title:** Софийнец зазида десетки прилепи, за да си сложи нова дограма
- Article Metadata:** OFFNews 05 декември 2016 в 21:44 38216 11
- Article Image:** A close-up photo of a bat being held in a person's hand.
- Right Sidebar:**
 - Най-важното:**
 - Видеозаписите от броенето в 7 секции отиват при прокурор (13:24 ч.)
 - Обвиниха бившата шефка на Митниците в съучастие в контрабанда (12:45 ч.)
 - Дело-шамар приключи 15 000 лева дълг за медсестрата, разкрила (13:24 ч.)
 - Изобретяването на... (12:45 ч.)
 - Всички но:** Очила, които стават... Не сменяйте повече очилата. ... оперpower | Sponsored. Прочетете следващата история >
- Footer:** Windows taskbar showing the time as 2:28 PM on 05-Nov-24.

BACKGROUND

Campaign of Green Balkans – “Wild Neighbours”

ЗНАЕТЕ ЛИ....ЧЕ ИМАТЕ ДИВИ СЪСЕДИ?!



Малко хора знаят, че панелните блокове са убежища и домове, както на хората, така и на защитени и полезни животни. Те са били изместени от своите естествени местообитания – старите гори и скалните масиви, като са се приспособили за живот в градовете, а за много от тях те са единственото място, където могат да живеят и да се размножават.

Такива са редица прилепи като ръждивия вечерник, кафявото прилепче, прилепчето на Натузий, булдоговия прилеп. Те обитават фугите на панелните блокове, пукнатини и пространства под отлепена мазилка. Достатъчен е отвор колкото монета от едно левче, за да може в него да живее прилеп, а една fuga може да прилети буквално стотици ръждиви вечерници.

ДА ОПАЗИМ ДИВИТЕ НИ СЪСЕДИ!



Панелните блокове са домове, освен на хората и на много защитени, и полезни животни.

Редица прилепи като ръждивия вечерник, кафявото прилепче, прилепчето на Натузий, булдоговия прилеп, обитават фугите на панелните блокове, пукнатини и пространства под отлепена мазилка.

Достатъчен е отвор колкото монета от едно левче, за да може в него да живее прилеп, а една fuga може да прилети буквално стотици ръждиви вечерници.

В панелните блокове живеят и редица защитени видове птици, каквито са например бурзолетите. Един блок може да приютава стотици двойки бурзолети, като на практика това е единственото място в градовете, където тези видове могат да се размножават.

Прилепите и бурзолетите излъчват огромни количества насекоми. Така например едно малко кафяво прилепче, което тежи едва 5 грама излъчва над 3000 насекоми за една вечер и само за един час може да излети 1200 комара! Така прилепите ни спасяват от вредителите в селското стопанство, от комари и прочие, а по този начин и от пестицидите, които са тяхното ограничаване.

Понякога в сградите живеят и птици като керкенецът, кукумявката и др., които се хранят с еризаци – домашни мишки, плъхове и полевки, които пречат на хората, като влизат в домовете им, могат да разнесат болести или пак „оарабват“ земеделската ни продукция, което налага използването на рогентциди.

Прилепите, бурзолетите, ластовиците, керкенезите, собите са ЗАЩИТЕНИ ВИДОВЕ!

За тях е забранено улавянето, безпокойството, унищожаването на убежищата им.

ПАЗЕТЕ ДИВИТЕ СЪСЕДИ НА ХОРАТА!

Материал и част от разкритието по проект „ДИВИ СЪСЕДИ“ – споделяне на редиците вградени, Матейски споделяне в Сграда Зелена. Проектът е реализиран благодарение на подкрепата от Европейския съюз и на даренията на Лео Димитров „За и с Лео за по-добър живот“. В партньорството с Фондация „Български дивни съседни“ и Български дивни съседни.

Организатори за споделянето на разкритието са: Фондация „Български дивни съседни“ и Сграда Зелена. Фондацията е с адрес: София, ул. Сграда Зелена 199, ет. 2. Ръководител: Мария Димитрова. Контакт: Мария Димитрова, тел. 02/ 812 811, e-mail: maria@bdivnysosedi.org

Сграда Зелена – Централен офис: 4000 София, ул. Сграда Зелена 199, ет. 2. Ръководител: Мария Димитрова. Контакт: Мария Димитрова, тел. 02/ 812 811, e-mail: maria@bdivnysosedi.org

Специален център за дивни животни: 4000 София, ул. Сграда Зелена 199, ет. 2. Ръководител: Мария Димитрова. Контакт: Мария Димитрова, тел. 02/ 812 811, e-mail: maria@bdivnysosedi.org



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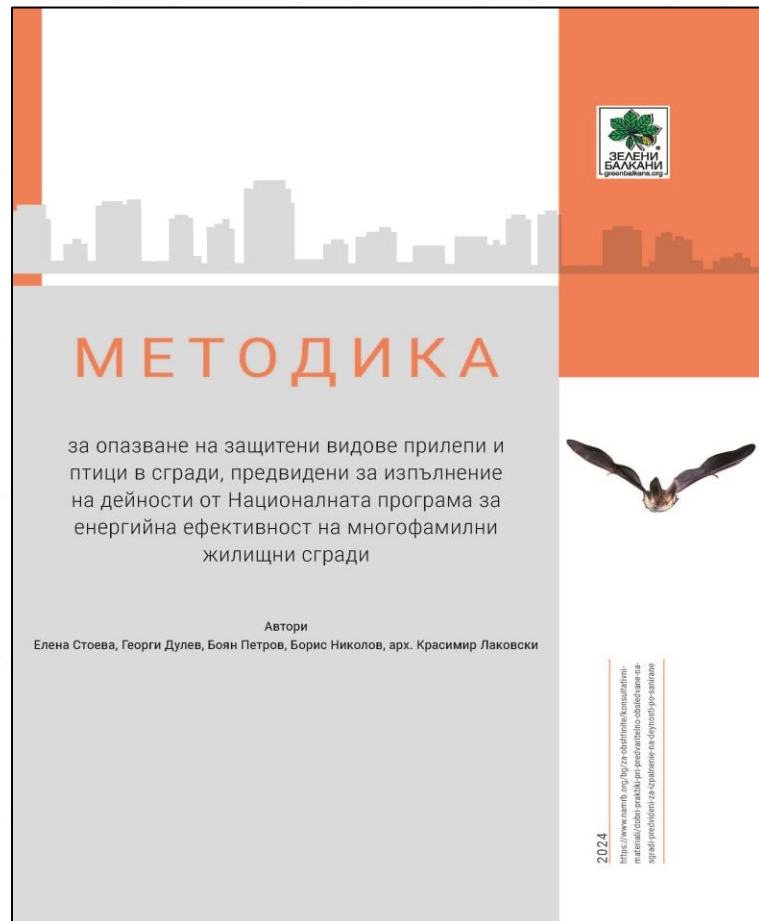
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Working group with the participation of the Ministry of Environment and Water, the Ministry of Regional Development and Public Works, Regional Inspectorates of Environment and Water (RIEW), the Bulgarian Ornithological Centre, the National Museum of Natural History – Bulgarian Academy of Sciences, and non-governmental organizations.





Methodology - Conservation of protected bat and bird species in buildings designated for implementation of activities under the National Programme for Energy Efficiency of Multifamily Residential Buildings

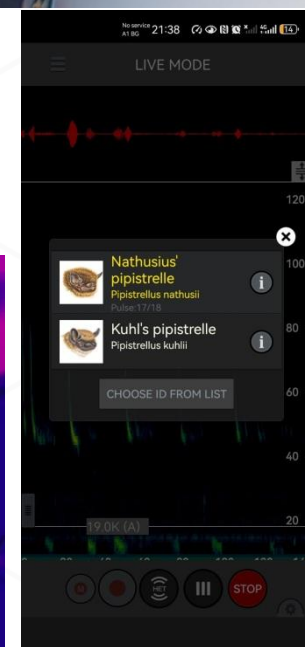
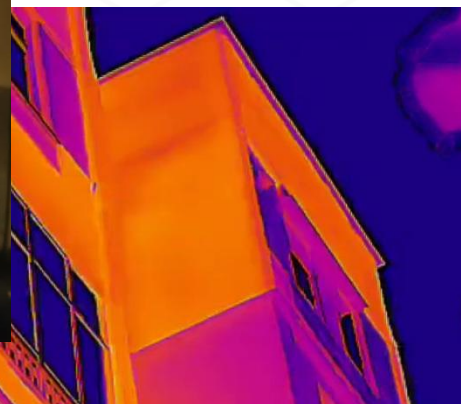
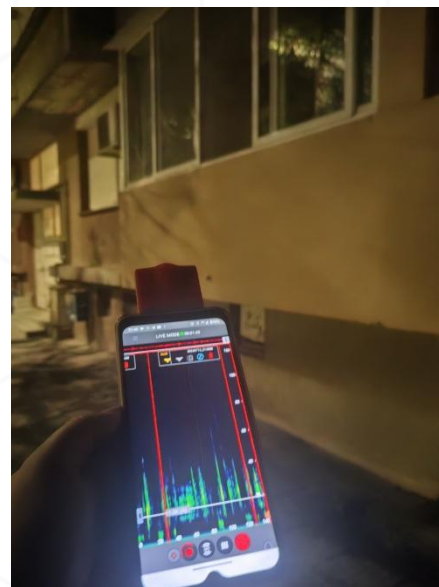
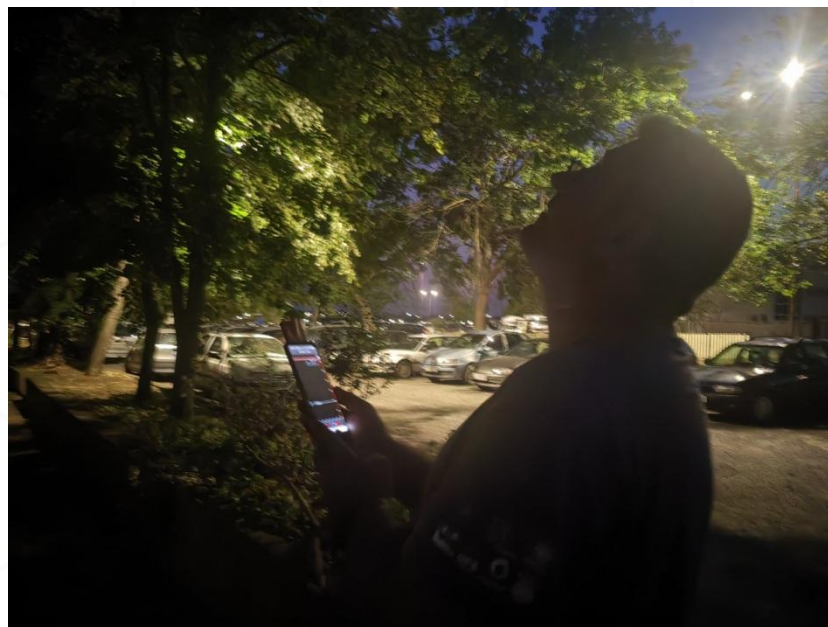
Authors (translated citation):

Elena Stoeva, Georgi Dulev, Boyan Petrov, Boris Nikolov, Arch. Krasimir Lakovski

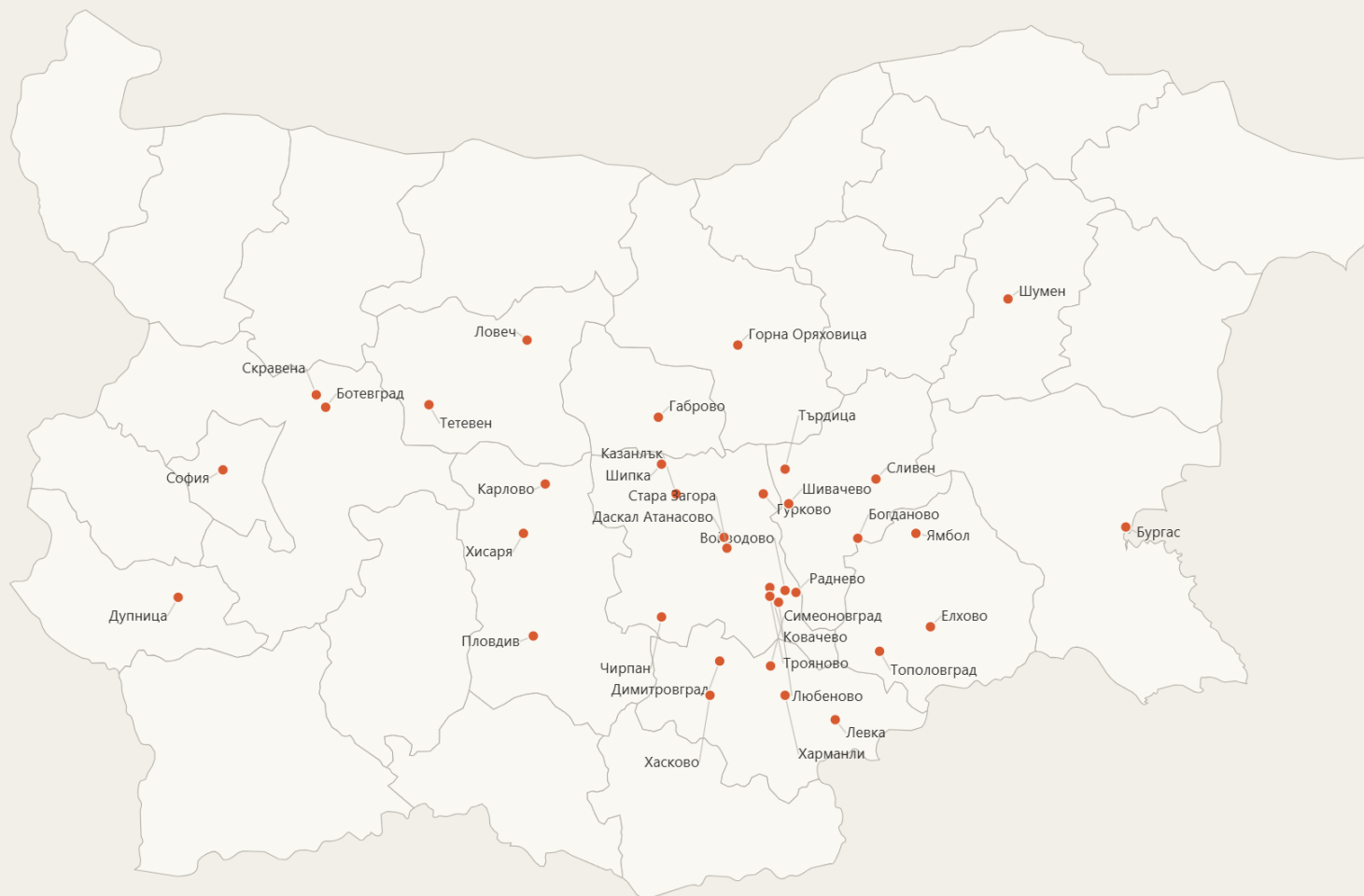
These were discussed by a broad range of experts during consultations and working group meetings at the Ministry of Regional Development and Public Works in the period 2016 – 2023.



The studies were conducted in the period 2024 – 2026 – up to the present.



The study presents data from pre-construction monitoring of multi-family residential and other buildings in **37 settlements** across the territory of Bulgaria.



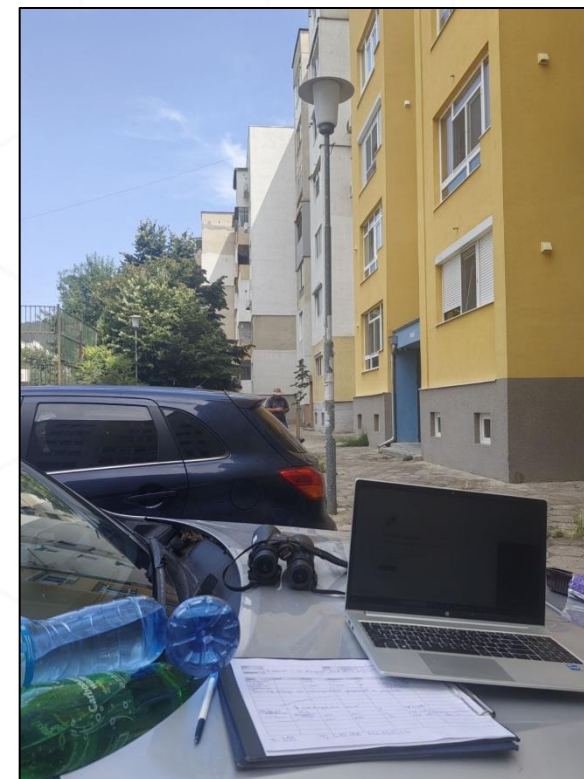
- Bogdanovo, ● Botevgrad,
- Burgas, ● Daskal Atanasovo,
- Voyvodovo, ● Gabrovo,
- Gorna Oryahovitsa,
- Gurkovo, ● Dimitrovgrad,
- Dupnitsa, ● Elhovo, ● Hisarya,
- Kazanlak, ● Karlovo,
- Kovachevo, ● Levka
- Lovech, ● Lubenovo, ● Maglizh
- Plovdiv, ● Pancharevo,
- Radnevo, ● Sofia, ● Simeonovgrad,
- Sliven, ● Stara Zagora,
- Skravena, ● Teteven,
- Topolovgrad, ● Tvarditsa,
- Troyanovo ● Harmanli,
- Haskovo, ● Hisarya, ● Chirpan,
- Shivachevo, ● Shipka,
- Shumen, ● Yambol.

RESULTS

NUMBER OF SURVEYED BUILDINGS BY CITY

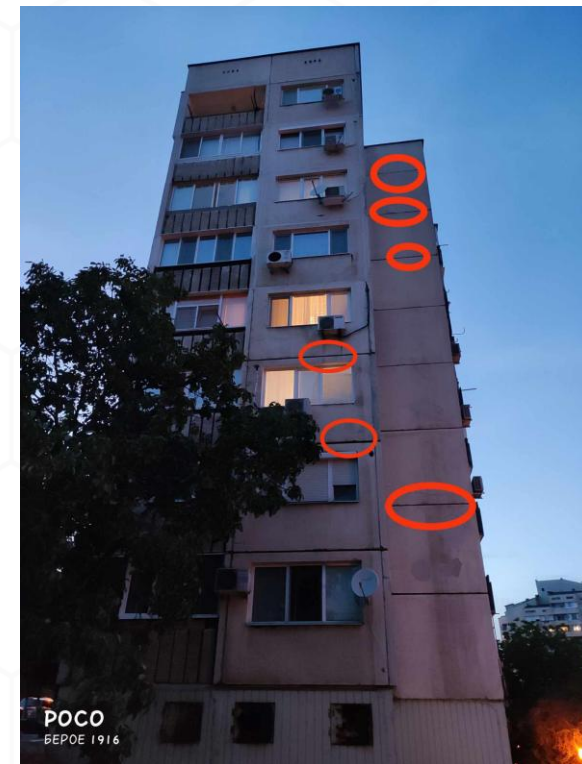
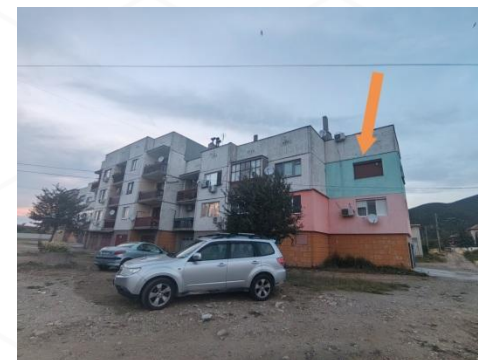
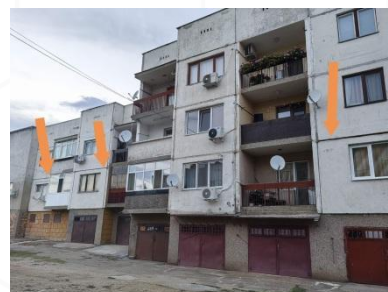
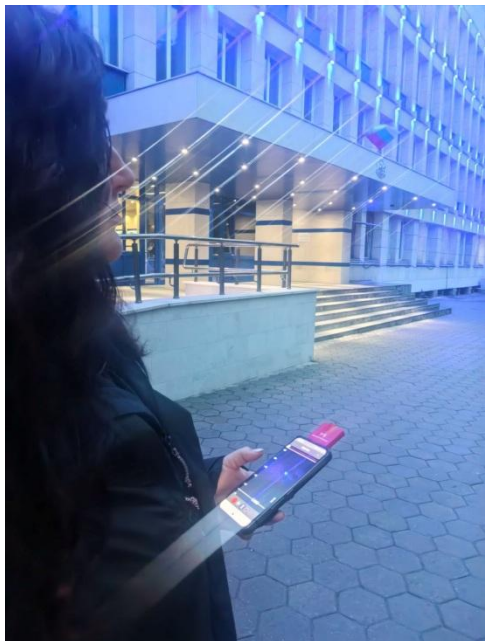
Bogdanovo – 1	Radnevo – 16
Botevgrad – 20	Simeonovgrad – 2
Burgas – 3	Skravena – 1
Voyvodovo – 1	Sliven – 30
Gabrovo – 3	Sofia – 1
Gorna Oryahovitsa – 7	Stara Zagora – 68
Gurkovo – 7	Teteven – 1
Daskal Atanasovo – 1	Topolovgrad – 4
Dimitrovgrad – 5	Troyanovo – 1
Dupnitsa – 1	Tvarditsa – 1
Elhovo – 16	Harmanli – 14
Kazanlak – 19	Haskovo – 15
Karlovo – 17	Hisarya – 1
Kovachevo – 1	Chirpan – 6
Levka – 1	Shivachevo – 1
Lovech – 4	Shipka – 1
Lubenovo – 1	Shumen – 10
Plovdiv – 30	Yambol – 13

TOTAL: 322 BUILDINGS





The studies were conducted in the period 2024–2026 – up to the present. **304 multi-family residential buildings, 26 public buildings** (5 hospitals, 16 schools and educational institutions – kindergartens, nurseries, schools, universities, 5 municipal buildings), and **2 single-family houses**



METHODOLOGY

Two types of surveys, depending on the stage of design and building renovation

Pre-project Study – March-October

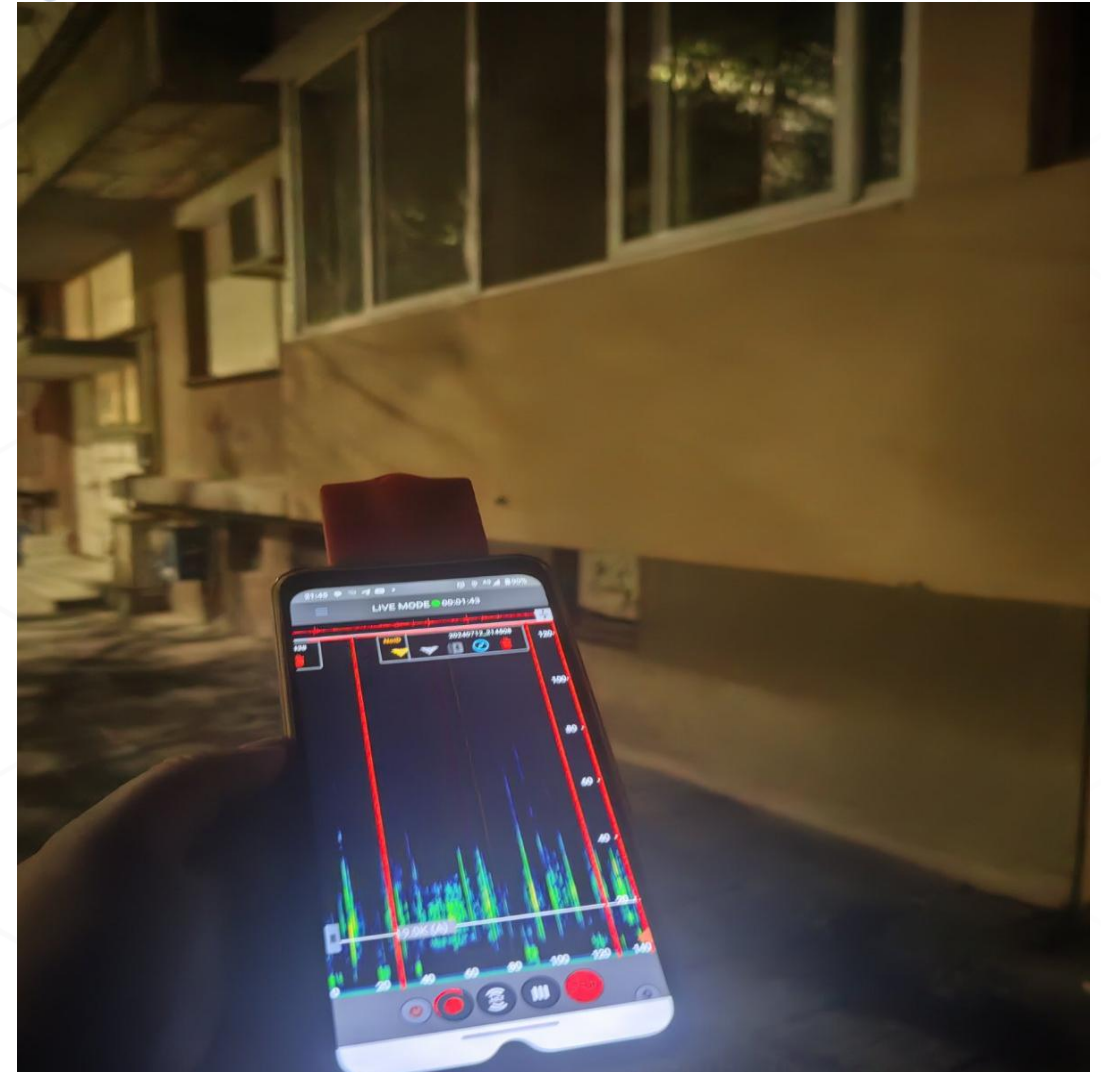
Purpose:

- Assessment of the presence of protected species;
- Design of compensatory roosts – to be included in the design documentation and in the construction permit documentation

Pre-construction Study – during the entire year

Purpose:

- Rescue of wintering bat colonies
- Exclusion (removal) of individuals

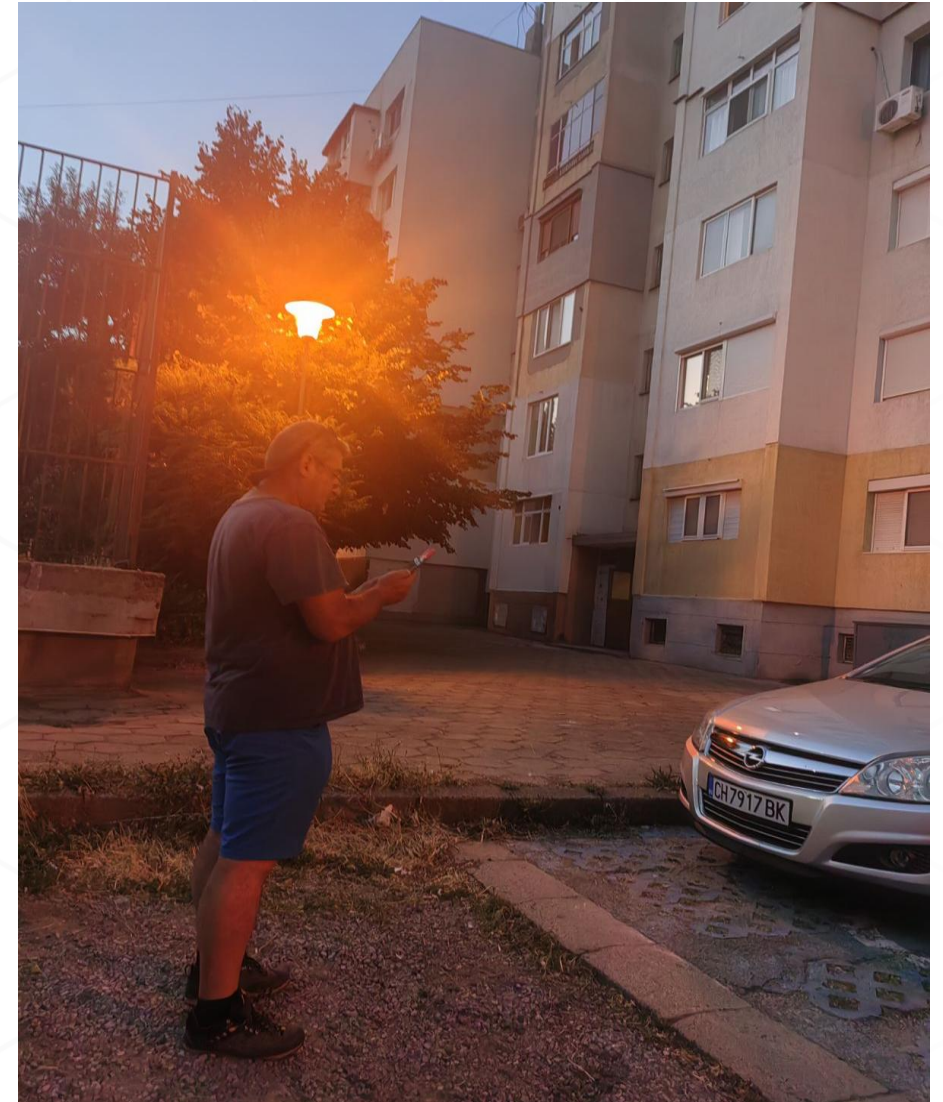


METHODOLOGY

The duration of the survey is at least one day and one night per site (approx. 24 hours).

At the team's recommendation, the survey may be extended by an additional night due to the size of the building or difficult access to all areas.

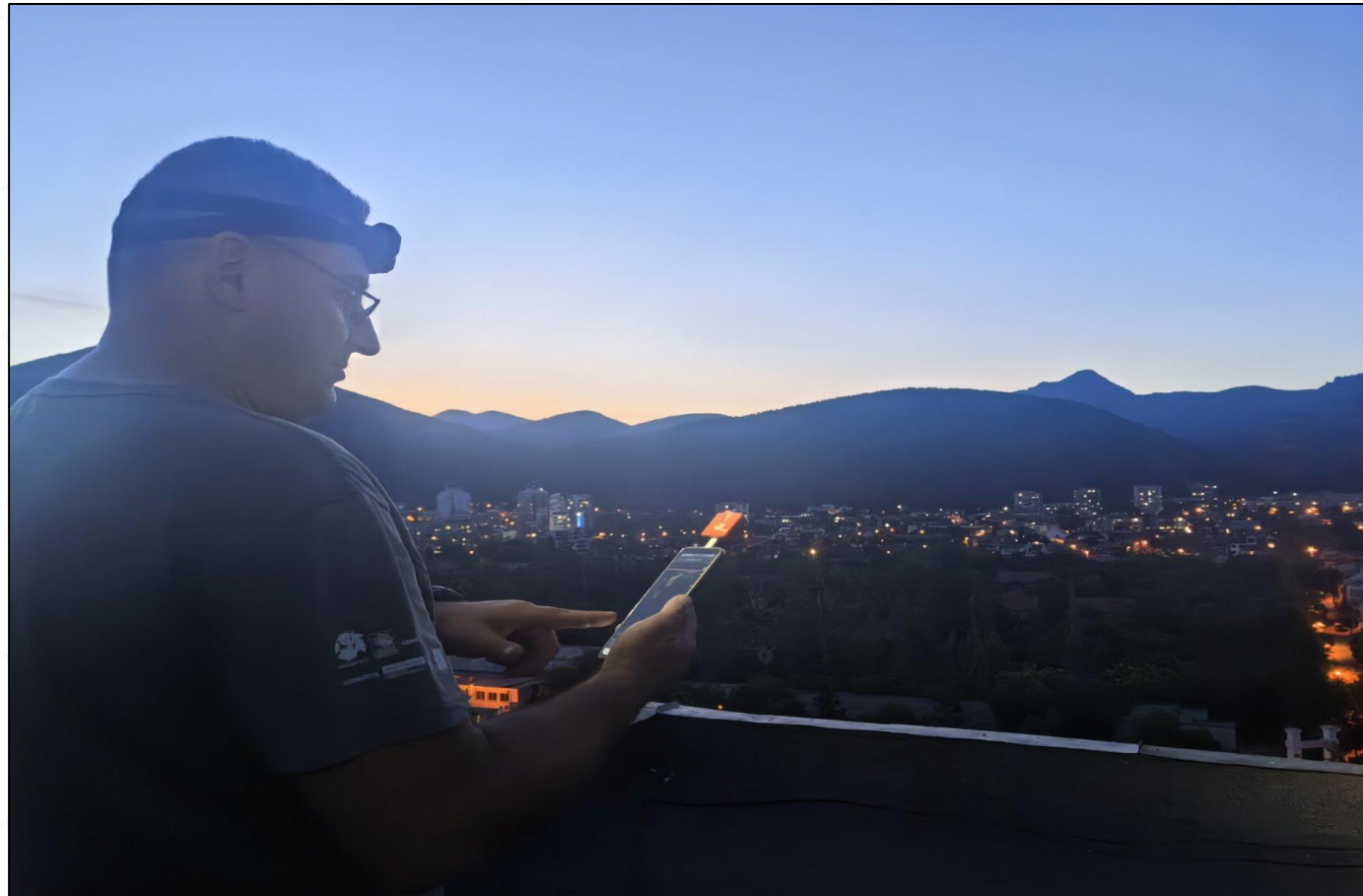
Inspections are carried out under suitable weather conditions in the period from March 1 to October 15.



METHODOLOGY

During the night:

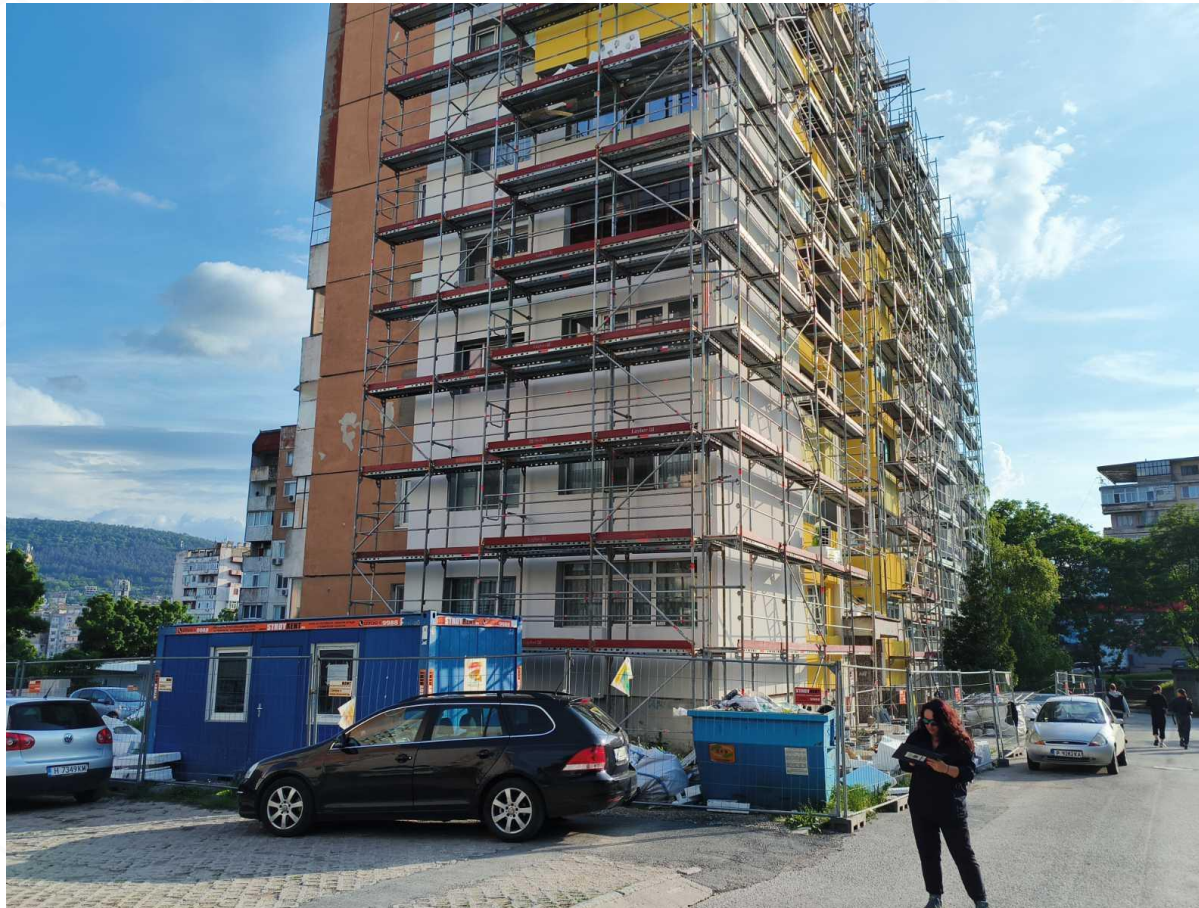
- Listening for the presence of Little Owls;
- Observation and counting of bats emerging from the building from each façade;
- Recording of occupied crevices that were numbered during the day;
- Recording with ultrasonic detectors.



METHODOLOGY

During the day:

- Inventory of Swallow Nests
- Surveys for Diurnal Birds of Prey
- Surveys for Bat Droppings and Potential Roosting Sites
- Identification of Common Swift Nesting Sites
- Other Observations of Birds and Bats (Including Bats Emerging During Daylight Hours)



Equipment used

For bird surveys:

Spotting scope – KOWA TSN 822M and Manfrotto tripod;

Binoculars – with 8× and 10× magnification.

For bats:

Bat detectors – Song Meter Mini Bat 2 AA, Song Meter Mini Bat 2 AA, Echo Meter Touch 2 Pro;

Night vision device (thermal camera) – InfiRay;

Recording devices – Samsung Galaxy smartphone;

Endoscopic camera for inspecting cracks and narrow spaces.

Other equipment:

Digital camera – Sony Alpha 7 IV;

Lens – Sigma 24–70 mm, f/2.8 aperture;

Lens – Sony FE 200–600 mm.





METHODOLOGY

Basic information

Address of the building;

Description of the building – number of floors, orientation, brick/panel construction, other features;

Building classification;

Findings

Description of the working methods and equipment used;

Bird roosts – descriptions are provided, and photos are included in which all recorded roosts are marked with arrows;

Bird species – abundance and characteristics of occupancy;

Bat roosts – all potential and confirmed bat roosts are described (cracks, peeling plaster, spaces under window sills, etc.). Photos are included in which all recorded roosts are marked with arrows;

Bat species – abundance and characteristics of occupancy;

Assessment of significance

VERY HIGH BIODIVERSITY SIGNIFICANCE – The building contains a variety of roosting and nesting sites and supports numerous individuals of protected bird and bat species. It features multiple horizontal and vertical structural joints, cavities, ledges, and similar elements that provide suitable habitat for large colonies of protected species.

Criteria: More than **30 pairs** of Pallid and/or Common Swifts, more than **20 pairs** of Alpine Swifts, more than **50 swallow nests**, or more than **200 bats**. A building is classified as being of **very high biodiversity significance** if it meets **any one** of these criteria or a combination of them.



HIGH BIODIVERSITY SIGNIFICANCE – The building contains numerous potential roosting and nesting sites (joints, cavities, gaps, open ventilation openings, access to enclosed structural voids and spaces, etc.). Individuals of protected species have been recorded, but species diversity is low and the overall abundance is not high.

Criteria: More than **20 swallow nests**; more than **20 pairs** of Pallid or Common Swifts (or more than **10 nests** of Alpine Swifts); more than **10 pairs** of Alpine Swifts; or more than **100 bats**.

If all of the above occur together, the building is classified as having **high biodiversity significance**.



METHODOLOGY

MEDIUM – The building contains a small number of potential roosting sites, with only a few occupied ones recorded. The abundance of protected species is low.

LOW – The building has almost no potential roosting sites, and no presence of protected species has been recorded. Individual specimens may still occur outside the survey period.

Criteria: 10 to 20 swallow nests; 10 to 20 pairs of Pallid or Common Swifts; 50 to 100 bats (meeting at least one of these criteria). If all three criteria are met simultaneously, the building is classified as having **high significance**.

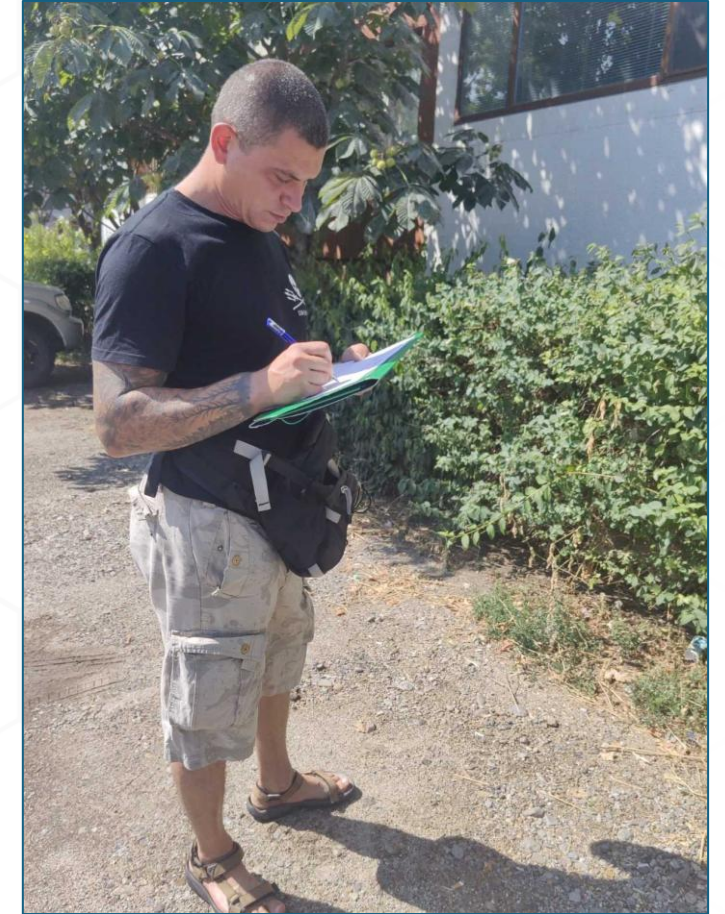


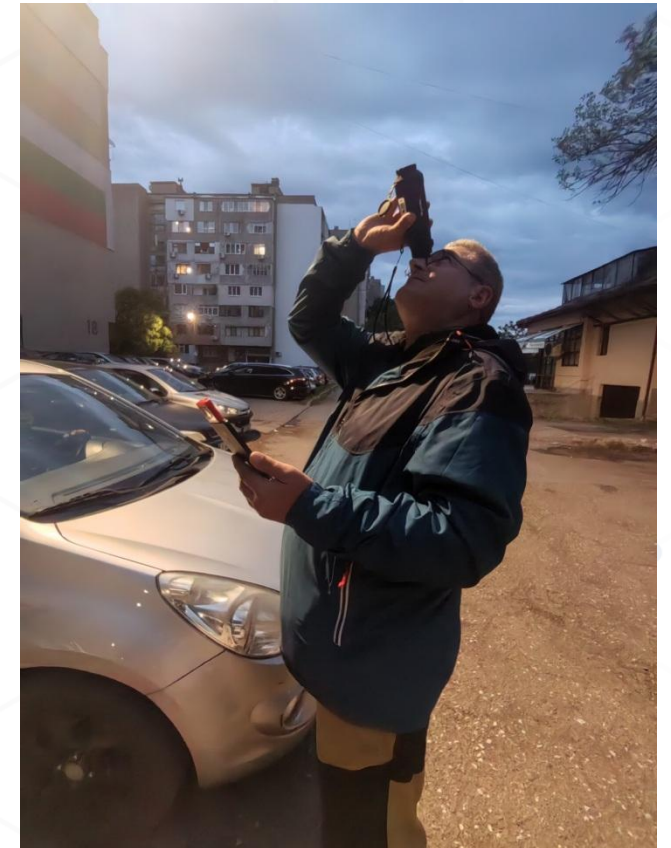
Nomenclature of potential roosting sites for protected species includes:

- Attic space
- Roof superstructures
- Balcony railings
- Decorative grilles in front of bathroom or stairwell windows
- Horizontal and vertical joints between prefabricated panels
- Joints between building sections
- Sheet metal cladding of roof parapets

In addition to these roosting sites determined by the construction system, there are also those resulting from building use and human modifications:

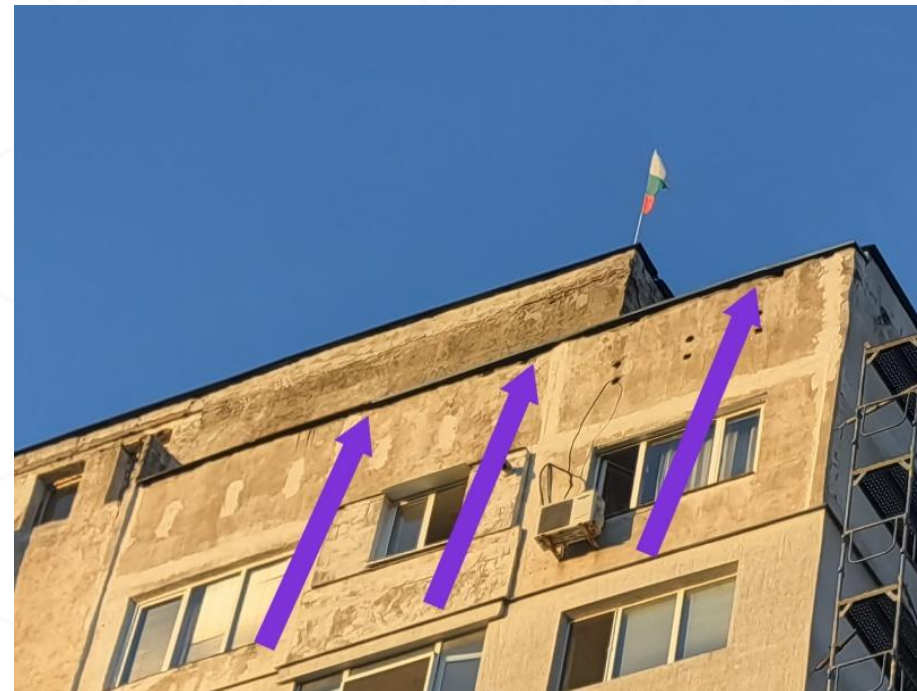
- Air-conditioning openings
- Ventilation and extractor fan openings
- External shutters
- Glazed balconies
- Gaps and cavities behind external thermal insulation systems
- Sheet metal flashings around window frames and insulation systems
- Detached plasterwork



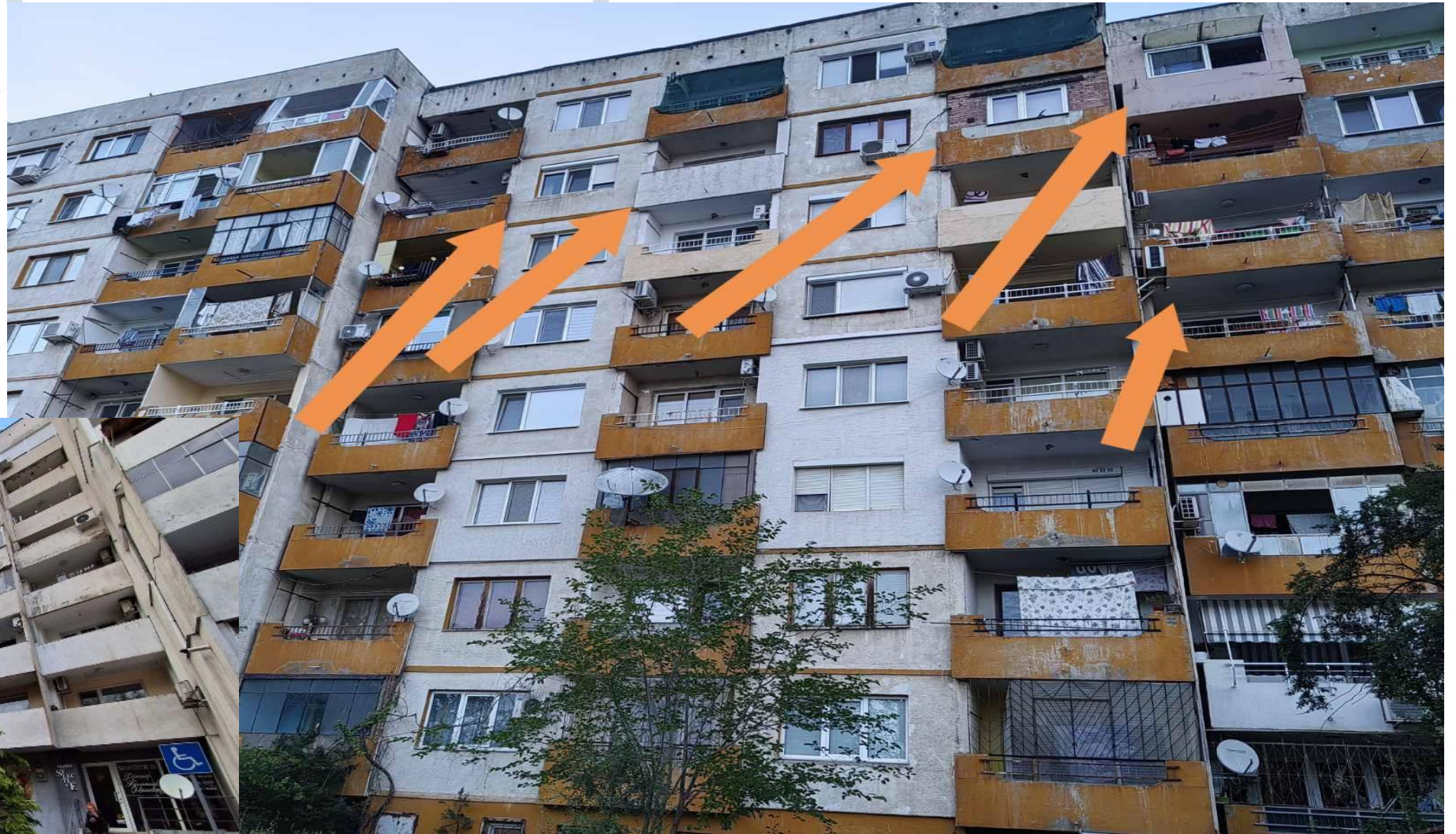


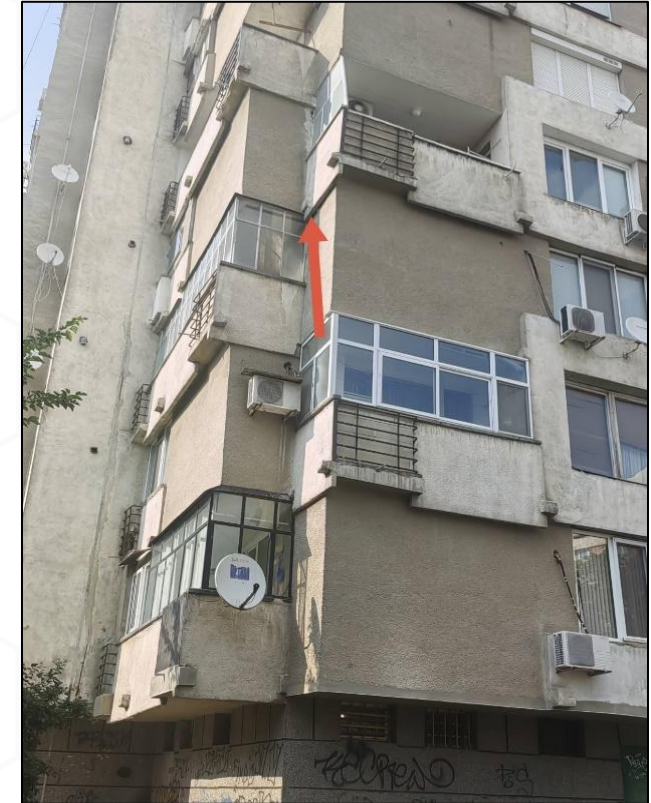
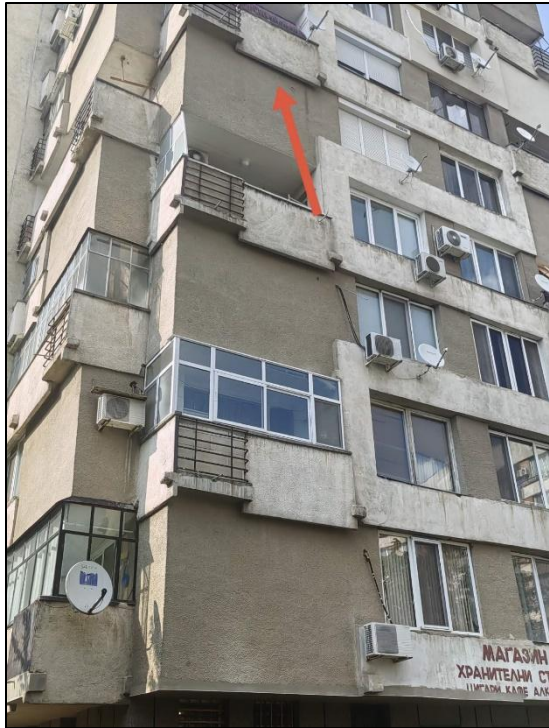
Roost types of protected species

Пространства под ламарини



Panel joints - the horizontal and vertical precast panel-to-panel connections



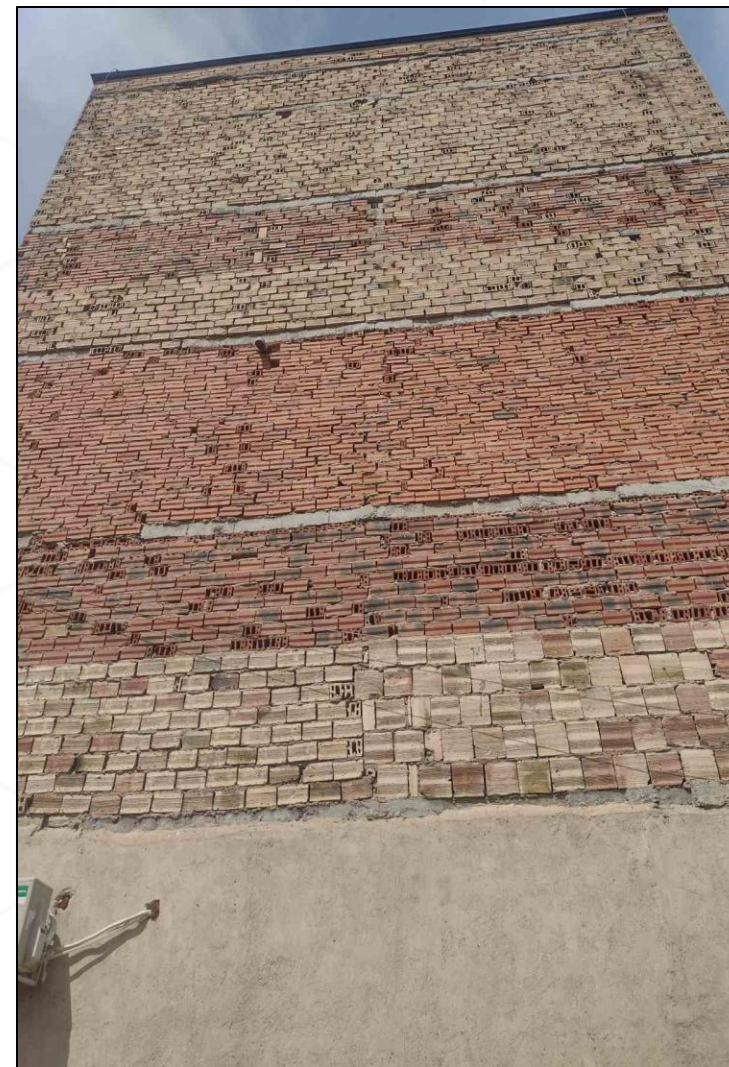


Alpine Swift Roosting Sites in a Building in Sliven

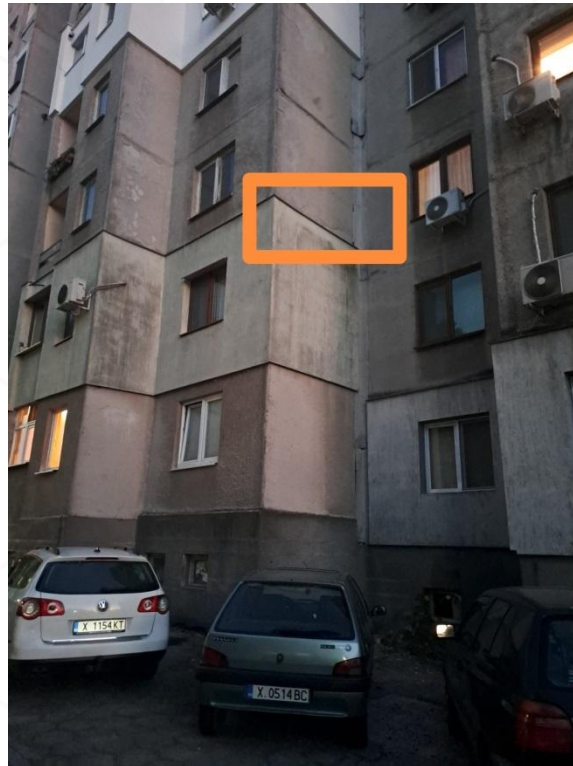
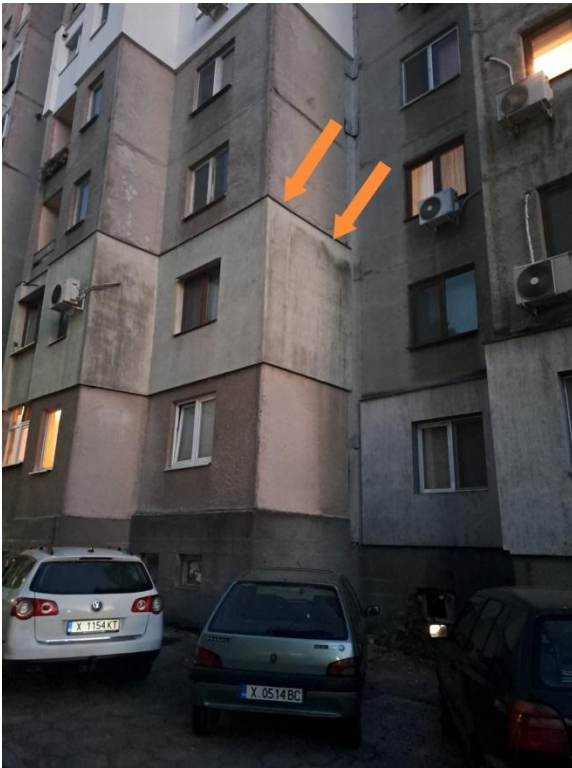
Eaves (facade moulding) and Window Sills



Voids in bricks and spaces between briks

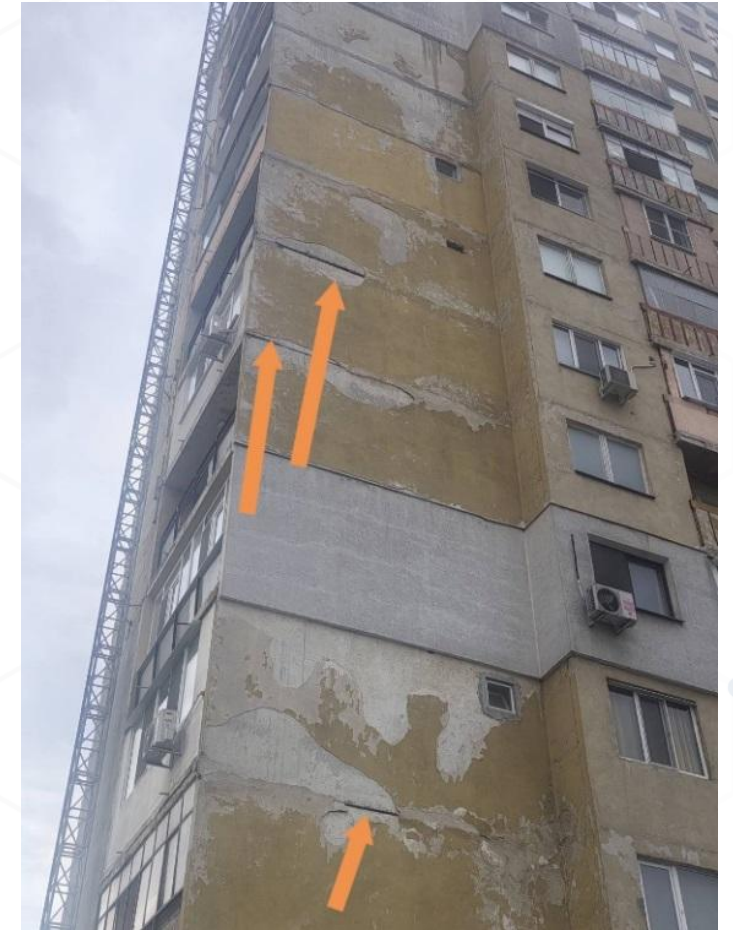


Voids beneath improperly installed insulation



Colony of Common Pipistrelles

Voids behind detached plaster (plaster debonding (separation from the wall))





METHODOLOGY

Building typology:

According to structural system:

Monolithic construction

Non-framed (load-bearing wall system)

Masonry

Cast-in-place reinforced concrete walls (Crane-mounted large area formwork system)

Log house

Framed (cast in place reinforced concrete frame system)

Beamed concrete slabs

Flat slabs (beamless)

Waffle slabs

Prefabricated construction

Precast concrete non-framed (panel buildings)

Precast concrete framed systems

According to the Spatial Development Act:

- low buildings - high up to 10 m (up to 3 storeys + 4.50 m for the attic space under the pitched roof);

middle buildings - high up to 15 m (4 to 5 storeys + 4.50 m for the attic space under the pitched roof);

high buildings - high over 15 m (more than 5 storeys);

The height of the building is measured from the elevation of the average level of the adjacent terrain to the elevation of the line of crossing of the facade surface with the roof surface - for buildings with eaves or to the highest point of the wall.

According to construction material:

- Brick masonry buildings

- Reinforced concrete buildings

- Timber buildings

- Steel buildings



Reinforced concrete buildings

A large-panel-system building



METHODOLOGY

The condition of the building façades and plasters was assessed as good, moderate, or poor, with deteriorated condition being considered a factor that may indicate the presence of protected species.



RESULTS

Protected species were recorded in 249 of the buildings (from 328 in total).



41 of the buildings were classified as very high significance sites due to the presence of large populations of bats, swifts, or other species protected under the Biological Diversity Act.

25 buildings were classified as high significance.

56 were classified as medium significance

133 buildings were classified as low significance, and in one

67 no protected species were recorded.

In addition, other species were also recorded, including the **Yellow-legged Gull** (*Larus michahellis*), **Western Jackdaw** (*Coloeus monedula*), and **Domestic Pigeon** (*Columba livia f. domestica*).



A total of **XXX** species of birds and bats listed in **Annex No. 3 of the Bulgarian Biodiversity Act** were recorded during the survey as using buildings as habitats:

Common Swift (*Apus apus*)
Pallid Swift (*Apus pallidus*)
Alpine Swift (*Apus melba*)
Common House Martin (*Delichon urbicum*)
Red-rumped Swallow (*Cecropis daurica*)
Common Kestrel (*Falco tinnunculus*)
Barn Owl (*Tyto alba*)
Little Owl (*Athene noctua*)
House Sparrow (*Passer domesticus*)
Great Tit (*Parus major*)
Common Pipistrelle (*Pipistrellus pipistrellus*)
Soprano Pipistrelle (*Pipistrellus pygmaeus*)
Common Noctule (*Nyctalus noctula*)
Savi's Pipistrelle (*Hypsugo savii*)
Kuhl's Pipistrelle (*Pipistrellus kuhlii*)
Nathusius' Pipistrelle (*Pipistrellus nathusii*)
European Free-tailed Bat (*Tadarida teniotis*)
Brown Long-eared Bat (*Plecotus auritus*)

A total of **18 species** of birds and bats listed in **Annex No. 3 of the Bulgarian Biodiversity Act** were recorded during the survey as using buildings as habitats:

Common Swift (*Apus apus*)
Pallid Swift (*Apus pallidus*)
Alpine Swift (*Apus melba*)
Common House Martin (*Delichon urbicum*)
Red-rumped Swallow (*Cecropis daurica*)
Common Kestrel (*Falco tinnunculus*)
Barn Owl (*Tyto alba*)
Little Owl (*Athene noctua*)
House Sparrow (*Passer domesticus*)
Great Tit (*Parus major*)
Common Pipistrelle (*Pipistrellus pipistrellus*)
Soprano Pipistrelle (*Pipistrellus pygmaeus*)
Common Noctule (*Nyctalus noctula*)
Savi's Pipistrelle (*Hypsugo savii*)
Kuhl's Pipistrelle (*Pipistrellus kuhlii*)
Nathusius' Pipistrelle (*Pipistrellus nathusii*)
European Free-tailed Bat (*Tadarida teniotis*)
Brown Long-eared Bat (*Plecotus auritus*)

In addition - acoustic groups of bats were detected based on sound recordings, potentially inhabiting the buildings or their surroundings

- *Nyctalus noctula*/*Nyctalus leisleri*/*Eptesicus serotinus*/*Vespertilio murinus*
- *Pipistrellus nathusii*/*kuhlii*
- *Miniopterus schreibersii*/*Pipistrellus pygmaeus*
- *Myotis 45 khz Type* (*Myotis capaccinii*/*Myotis bechsteinii*/*Myotis dasicneme*/*Myotis daubentonii*)

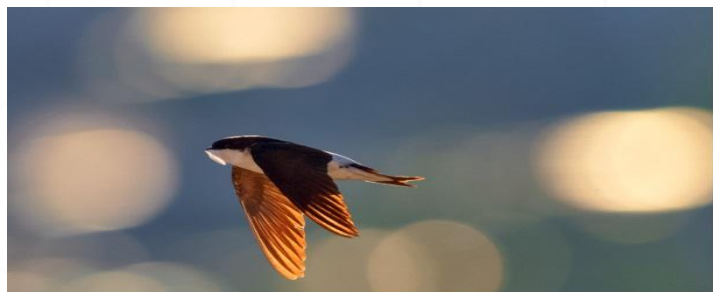
Numerous other species inhabiting urban environments were recorded in the vicinity of the buildings. These species use the buildings as roosting sites or forage in their surroundings, including:

Grey Long-eared Bat (*Plecotus austriacus*)
Serotine Bat (*Eptesicus serotinus*)
Parti-coloured Bat (*Vespertilio murinus*)
Soprano Pipistrelle (*Pipistrellus pygmaeus*)
Lesser Noctule (*Nyctalus leisleri*)
Greater Noctule (*Nyctalus lasiopterus*)
Common Bent-wing Bat (*Miniopterus schreibersii*)
Long-eared Owl (*Asio otus*)
Eurasian Scops Owl (*Otus scops*)
Eurasian Sparrowhawk (*Accipiter nisus*)
Peregrine Falcon (*Falco peregrinus*)
Hawfinch (*Coccothraustes coccothraustes*)
Common Chaffinch (*Fringilla coelebs*)
European Greenfinch (*Chloris chloris*)
Lesser Kestrel (*Falco naumanni*)
Eurasian Blue Tit (*Parus caeruleus*)
Black Redstart (*Phoenicurus ochruros*)
Common Wood Pigeon (*Columba palumbus*)
White Stork (*Ciconia ciconia*)
and other species.

More than 20 protected species

Common Swift (*Apus apus*)
Pallid Swift (*Apus pallidus*)
Alpine Swift (*Tachymarptis melba*)
Common House Martin (*Delichon urbicum*)
Barn Swallow (*Hirundo rustica*)





Great Tit (*Parus major*)
Blue Tit (*Cyanistes caeruleus*)
Common Kestrel (*Falco tinnunculus*)
Little Owl (*Athene noctua*)



Noctule Bat (*Nyctalus noctula*)
Leisler's Bat (*Nyctalus leisleri*)
Greater Noctule Bat (*Nyctalus lasiopterus*)



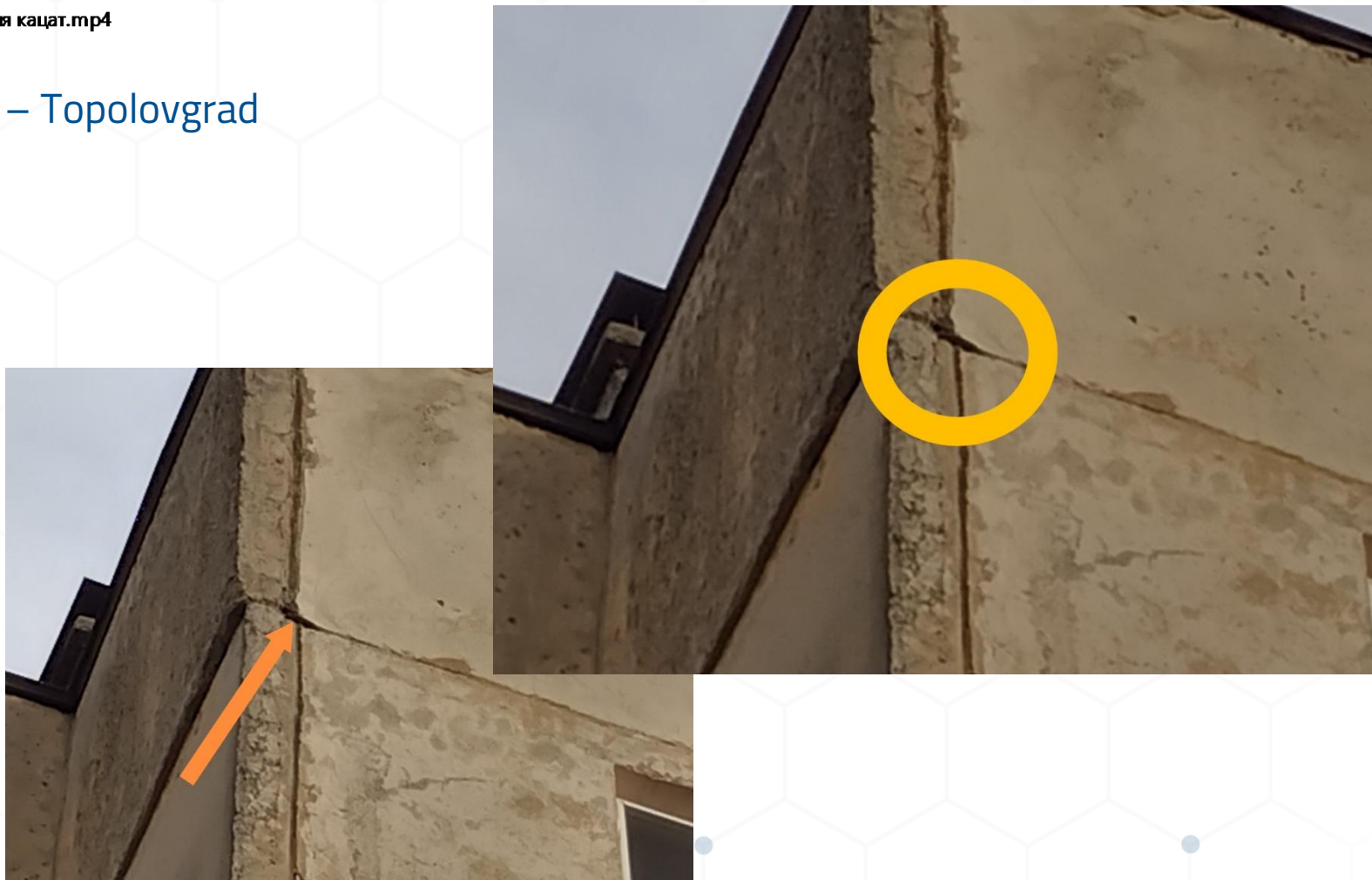
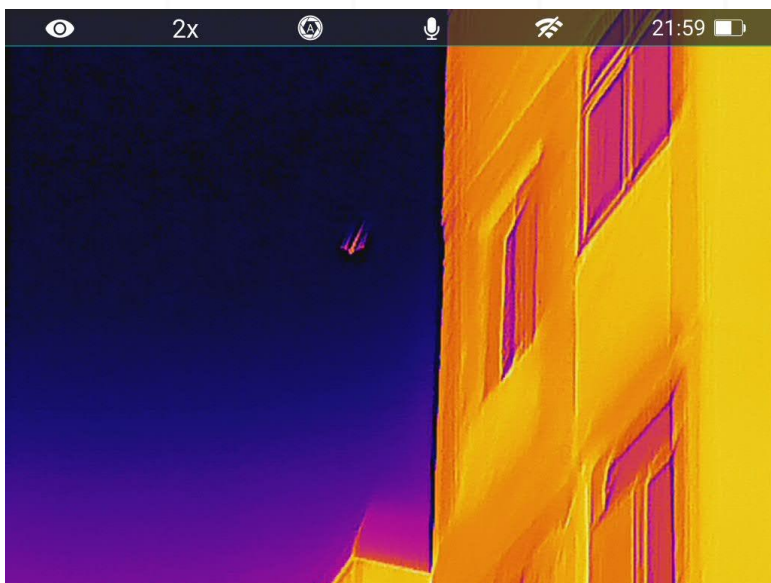
Common Pipistrelle (*Pipistrellus pipistrellus*)
Soprano Pipistrelle (*Pipistrellus pygmaeus*)
Pipistrellus kuhlii
Nathusius' Pipistrelle (*Pipistrellus nathusii*)
Savi's Pipistrelle (*Hypsugo savii*)





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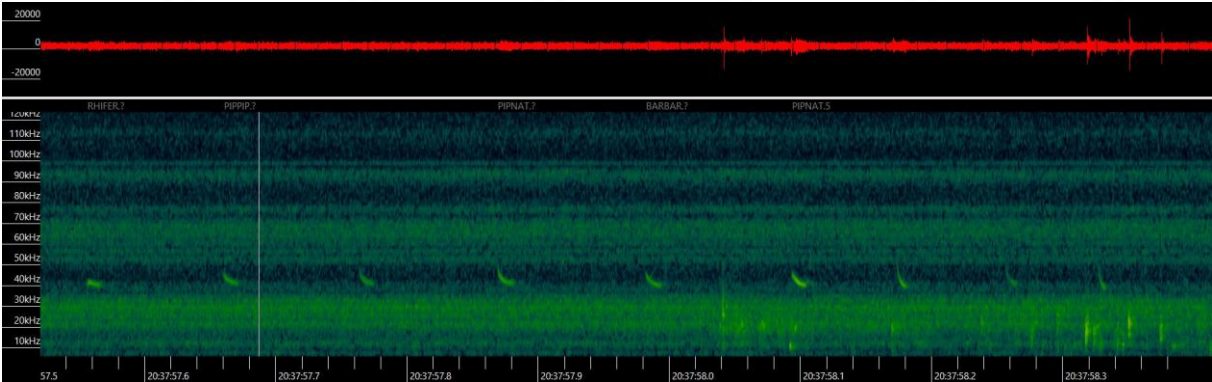
Kuhl's Pipistrelle Colony – Topolovgrad



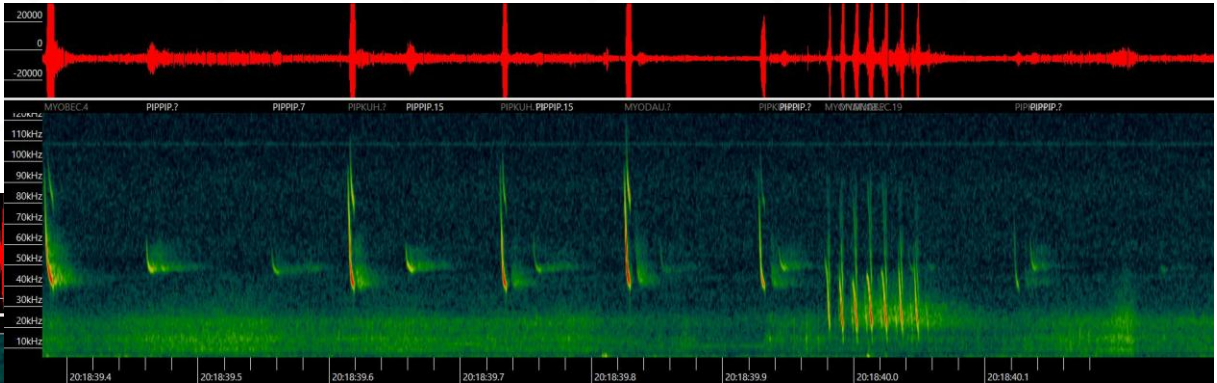
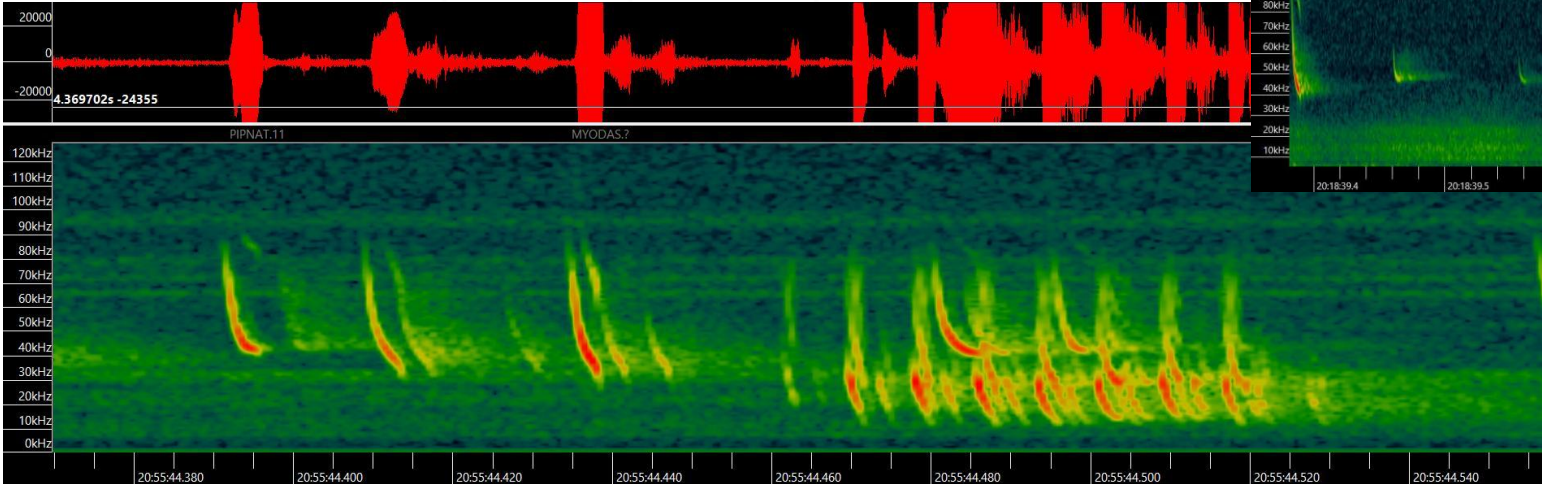
Serotine Bat (*Eptesicus serotinus*)
Parti-coloured Bat (*Vespertilio murinus*)
Lesser Horseshoe Bat (*Rhinolophus hipposideros*)
Greater Mouse-eared Bat (*Myotis myotis*)
Grey Long-eared Bat (*Plecotus austriacus*)

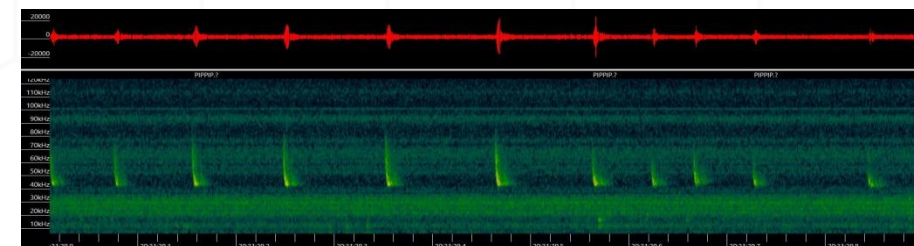
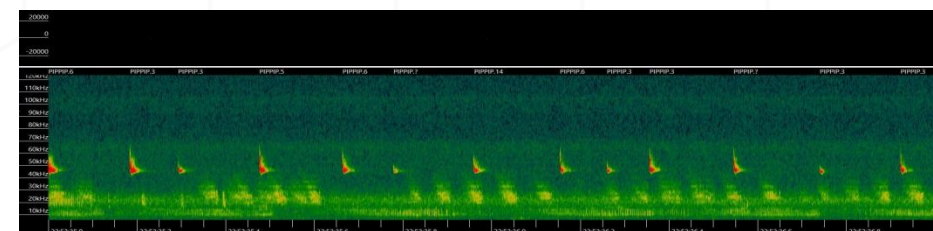
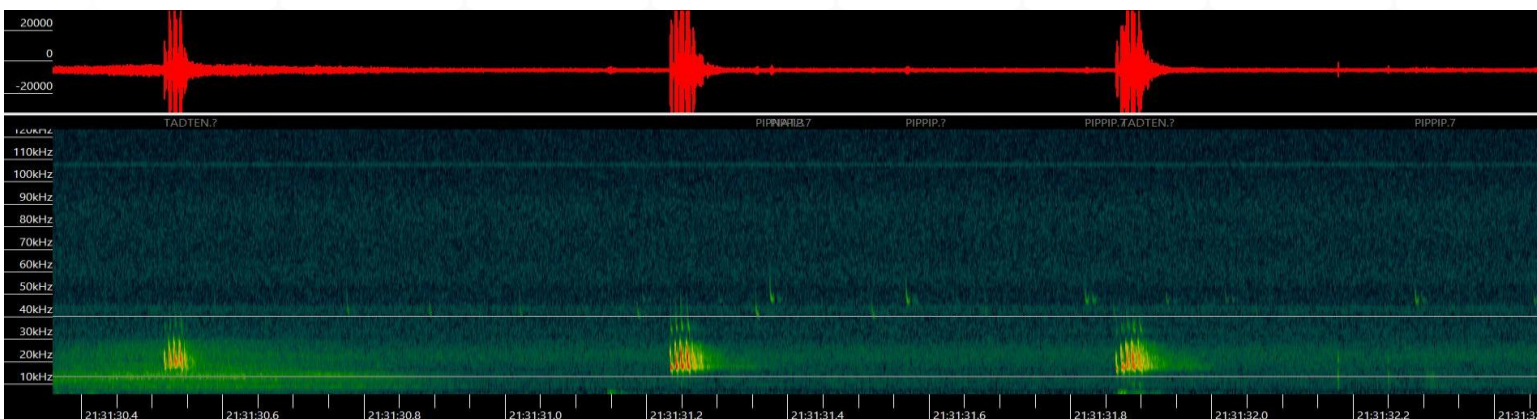


Pipistrellus nathusii/kuhlii

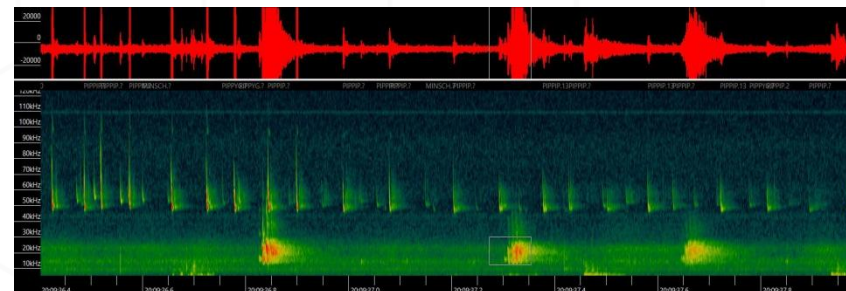
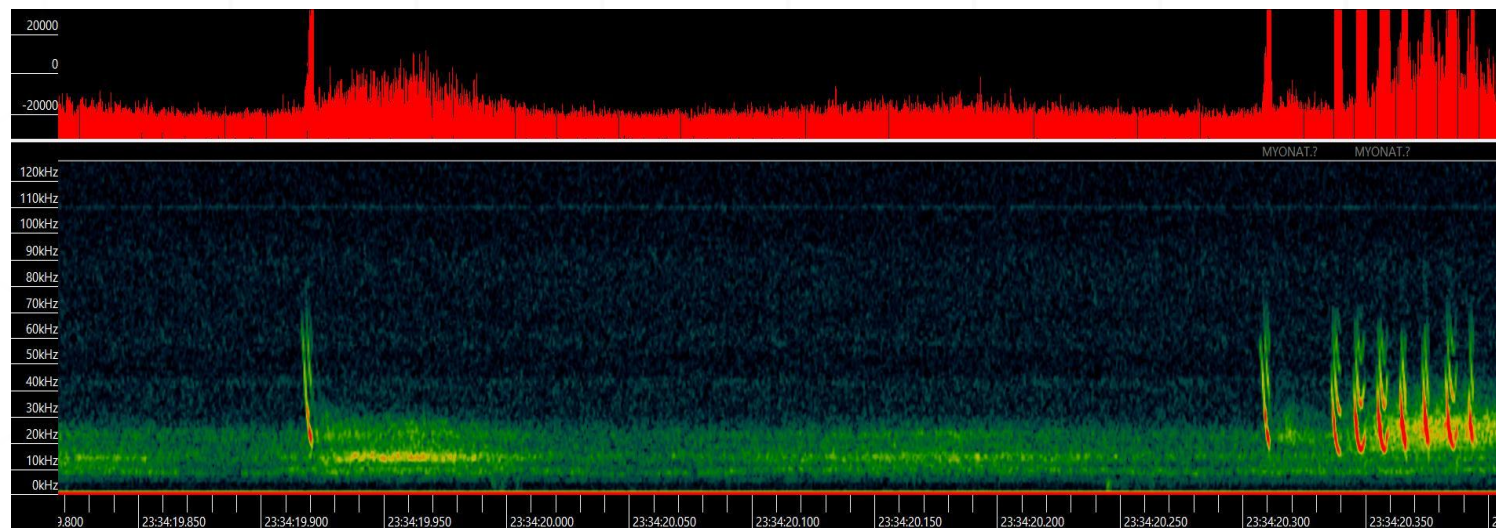
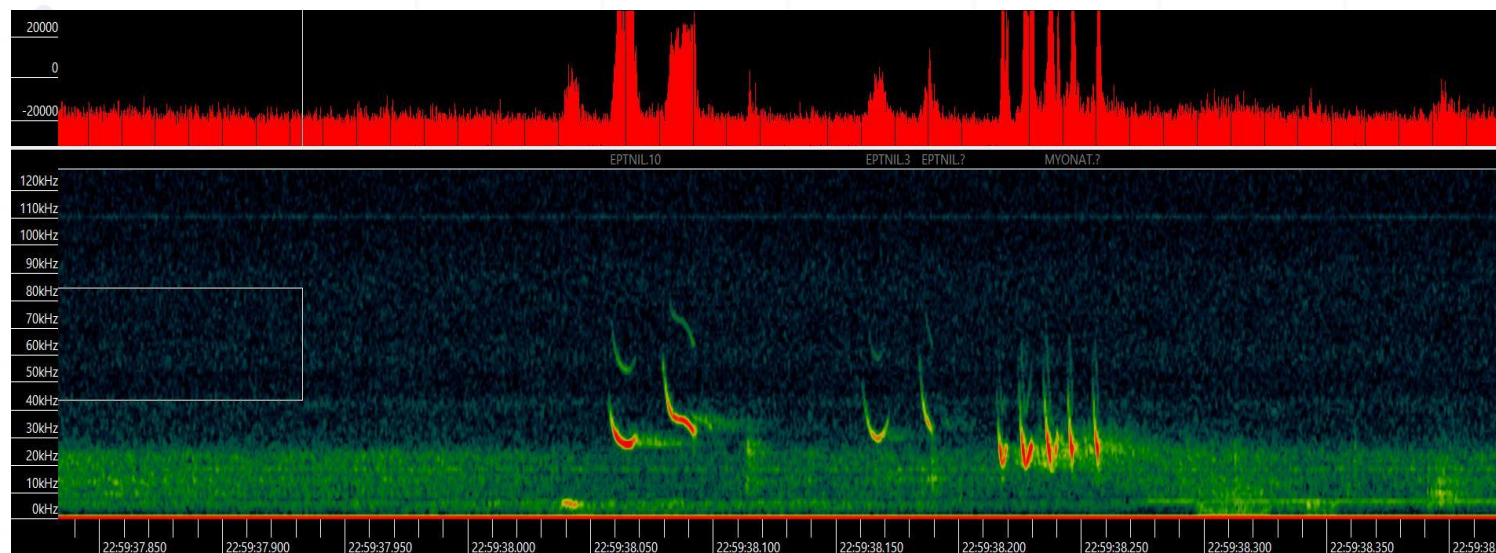


Pipistrellus kuhlii

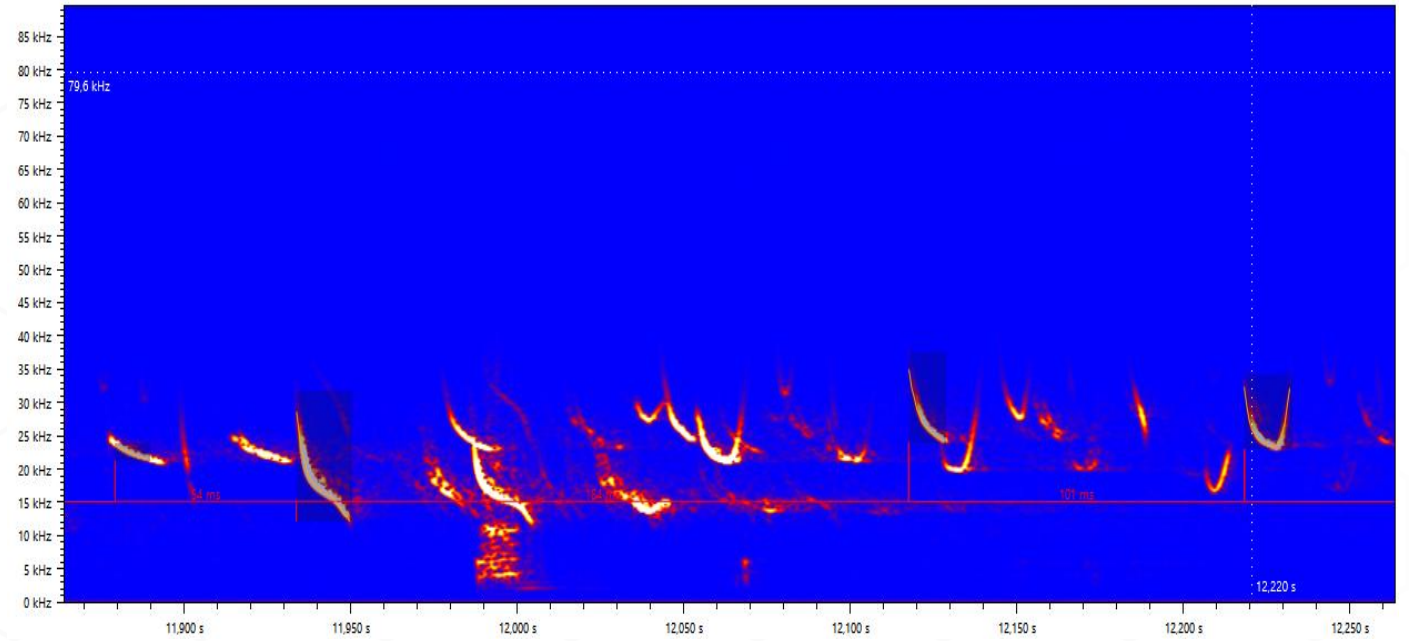




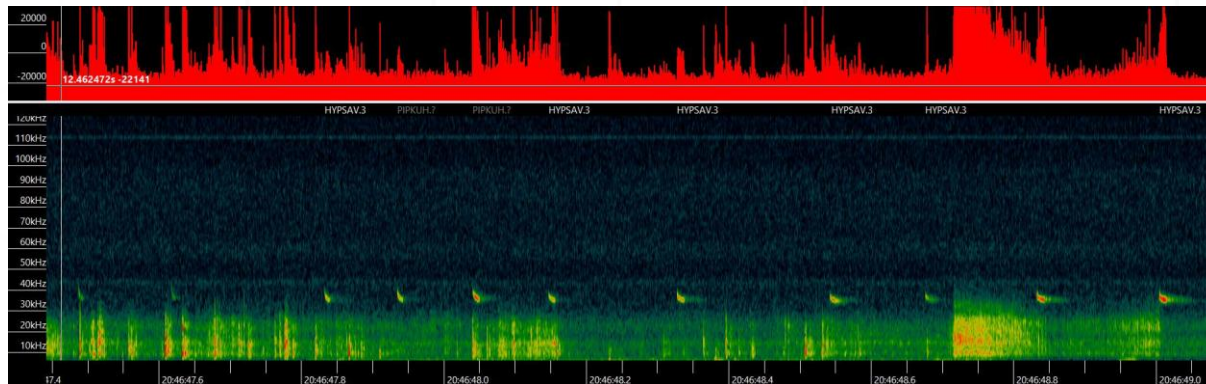
Pipistrellus pygmaeus



Nyctalus noctula



Hypsugo savii



RESULTS

The species **Kuhl's Pipistrelle** (*Pipistrellus kuhlii*) was recorded through acoustic monitoring and the detection of social calls in Stara Zagora, Karlovo, Topolvgard, Gorna Oryahovitza, Plovdiv, Dimitrovgrad while **Nathusius' Pipistrelle** (*Pipistrellus nathusii*) was recorded in Topolvgard, Burgas, Plovdiv, Radnevo - settlements where no previous records of their occurrence were available.

The **European Free-tailed Bat** (*Tadarida teniotis*) was recorded in three settlements: Stara Zagora, Karlovo, and Plovdiv.

Savi's Pipistrelle (*Hypsugo savii*) was recorded in Elhovo, Sliven, Gurkovo, Stara Zagora, Karlovo, Lovech, and Plovdiv.

The **Serotine Bat** (*Eptesicus serotinus*) was recorded in Kazanlak, Simeonovgrad, Topolovgrad, Dimitrovgrad, Haskovo, Lovech, Radnevo and Shumen.

The **Greater Noctule** (*Nyctalus lasiopterus*) and the **Lesser Noctule** (*Nyctalus leisleri*) were recorded in Kazanlak, Simeonovgrad and Radnevo.

The **Parti-coloured Bat** (*Vespertilio murinus*) was confirmed in **Kazanlak, Simeonovgrad, and Topolovgrad.**

The **Common Pipistrelle** (*Pipistrellus pipistrellus*) was recorded in Kazanlak, Shipka, Sliven, Yambol, Simeonovgrad, Topolovgrad, Elhovo, Plovdiv, Dimitrovgrad, Haskovo, Chirpan, Harmanli, Stara Zagora, Voyvodovo, Karlovo, Lovech, Burgas, Gabrovo, Gorna Oryahovitsa, Shivachevo, Radnevo and Tvarditsa.

- **Soprano pipistrelle** (*Pipistrellus pygmaeus*) was recorded in – Yambol, Topolovgrad, Elhovo, Sliven, Dimitrovgrad, Harmanli, Stara Zagora, Radnevo

RESULTS

The present study provides evidence of the potential destruction of:

At least **1,100 swallow nests**, some of which contained eggs or flightless chicks.

Roosting sites of at least **400 pairs of swifts** (Common Swift, Pallid Swift, and Alpine Swift), some of which contained eggs or flightless chicks.

15 roosting sites of owls and diurnal birds of prey.

106 buildings hosting bat colonies, including breeding colonies with non-volant juveniles.



CONCLUSIONS

The study confirms the major importance of buildings as refuges for protected species and highlights the significant impact that energy-efficiency measures can have on their populations. These findings underscore the need for the active involvement of public institutions and civil society to ensure that such measures do not result in a drastic decline in the populations of these species.



CONCLUSIONS

So far, there are no data on effective compensatory measures.
Several cases of fictitious such measures have been described





The LifeWatch ERIC Biodiversity & Ecosystem eScience Conference

PLOVDIV, BULGARIA

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Slaveya Stoycheva

Rollin Verlinde

Hugo Willox

Dilyan Georgiev

Hristo Nikolov

Sliven Municipality

Ivaylo nikolov

THANK YOU!

Questions?

bats@field.work.gmail.com

