



## A cave has multiple zones within

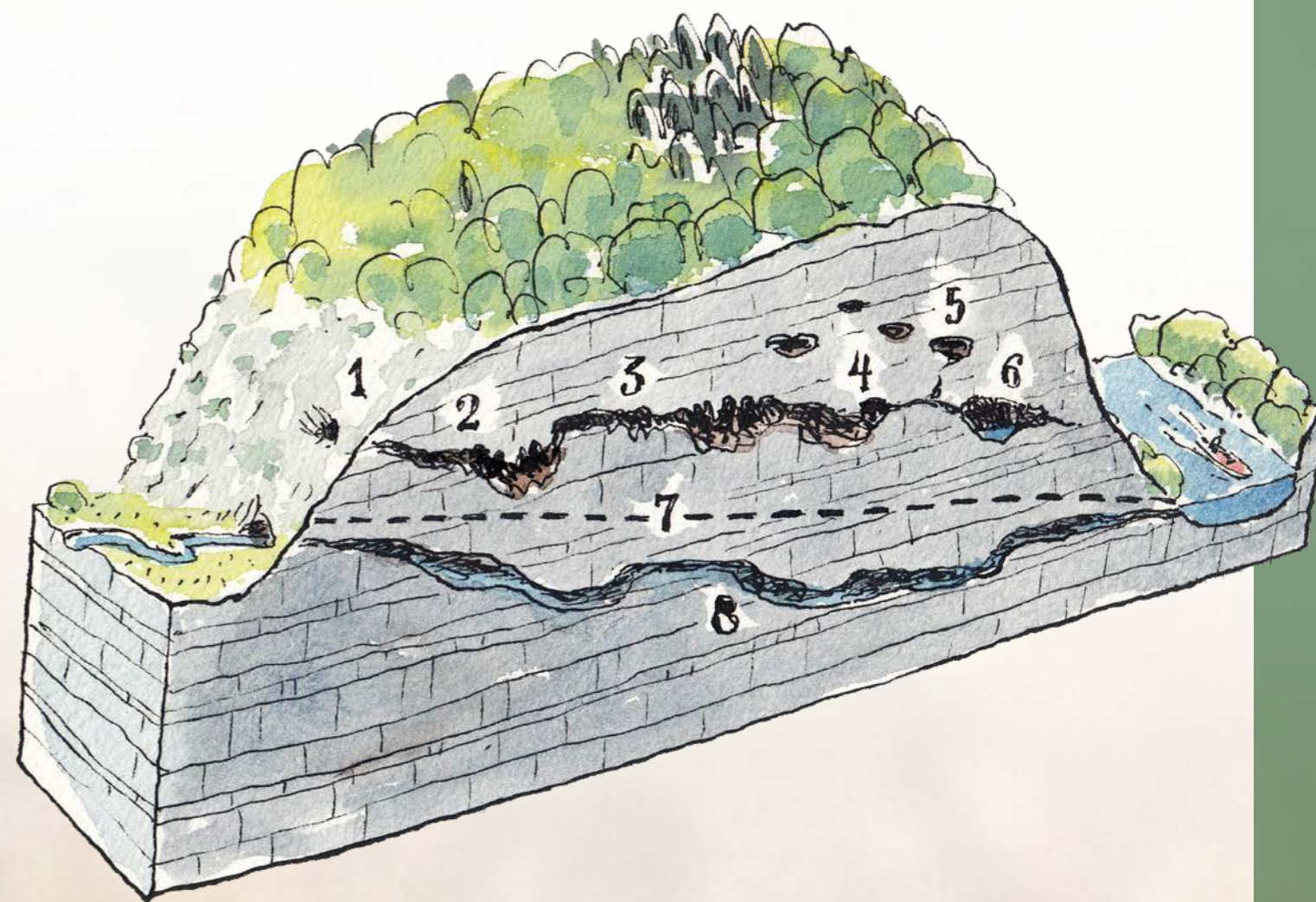
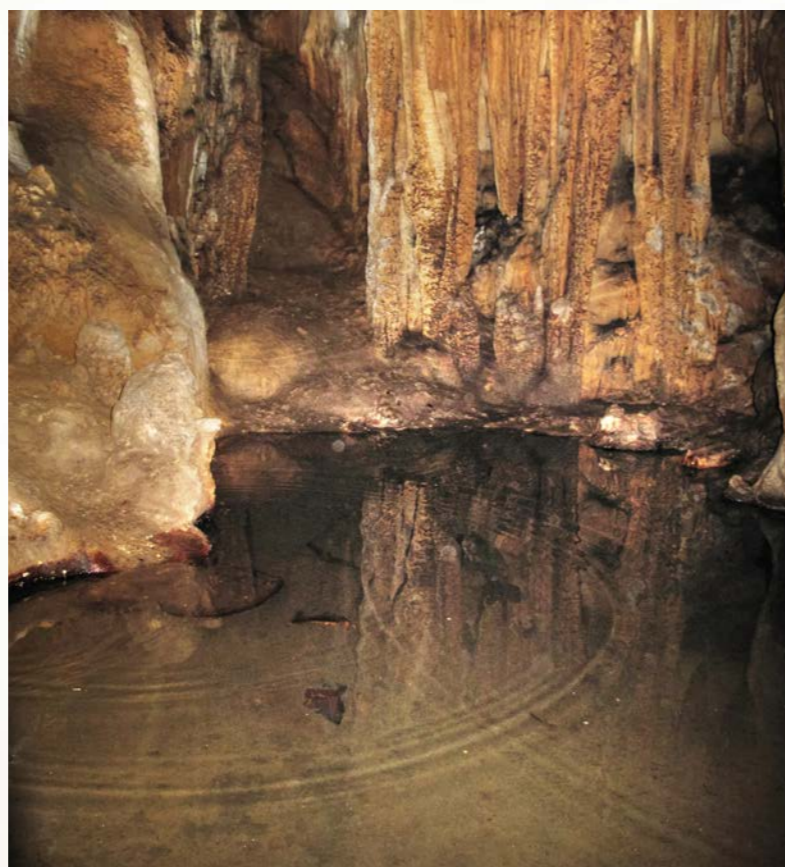
1. **Entrance zone** (light, wind, humidity and temperature vary significantly)
2. **Twilight zone** (half darkness, humidity and temperature vary less)
3. **Transitional zone** (darkness, humidity and temperature vary very little)
4. **Deep zone** (darkness, very damp, humidity and temperature are fixed)
5. **Still air zone** (darkness, very damp, humidity and temperature are fixed)
6. **Underground lake** (darkness, still and shallow water)
7. **Underground water table** (darkness, almost still water).
8. **Underground river** (darkness, running water)

## The water creates caves

Rain water penetrates the tiny gaps in the ground. Throughout its route, it dissolves some rocks (limestone, marble) and creates caves.

In Greece only, scientists have recorded more than 10,000 caves, but only 600 have been so far systematically studied by biologists.

The networks of caves and subterranean rivers serve as a route for the transfer of water created by the melting snow and supply water to springs, rivers, wetlands and the cities.



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## Troglobites have adapted to live in the dark

Troglobites can only survive in the depths of caves and underground crevices.

They are different from their relatives which live outside the caves because:

1. **they are light-colored** (they don't need to hide in the dark)
2. **they have very small eyes or no eyes at all** (they don't need them)
3. **they have a very thin exoskeleton or shell** (they are not threatened by dehydration)
4. **they have long legs and antennas** (they use them to "see" in the dark)
5. **they have very slow metabolism** (they move slowly, they eat very little)
6. **they live for a long time** (thanks to their slow metabolism)
7. **they lay few, large eggs** (because egg predators are rare)
8. **they don't have biological rhythms** (they move or sleep 24 hours a day, they reproduce all year round)



## Caves are inhabited by troglobites

Even though plants can't grow in the dark, some animals have adapted to the dark and survive by feeding on bat manure, fungi or smaller animals.

Many **troglobite** species are endemic, often native in a single cave. In Greece, more than 860 species of these animals have been recorded in 535 caves. Out of these, 400 invertebrate species are endemic to Greece and about 200 are troglobites.



To find out which animals live in each cave, visit the online database of the **Hellenic Institute of Speleological Research** <https://database.inspee.gr/>.



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## Bats roost in caves

Bats are the only mammals that fly actively by using their "hands" as wings. These have very long fingers which are connected with a thin membrane of skin.



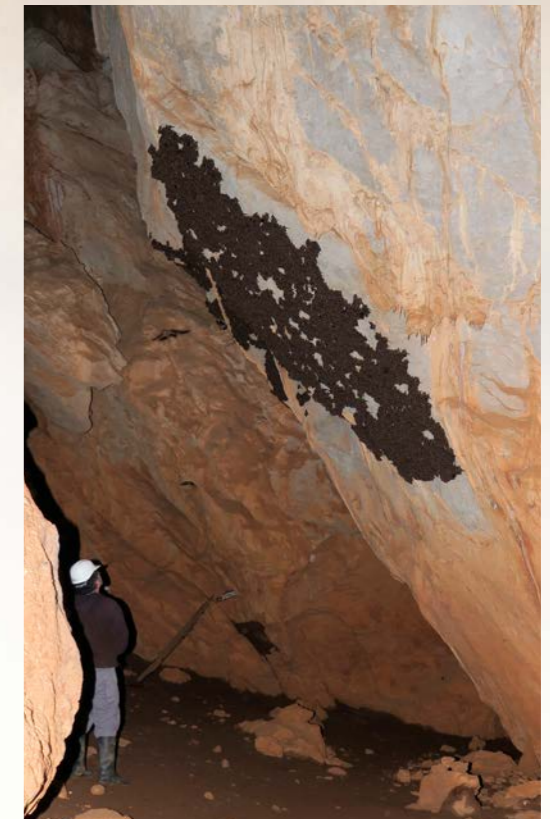
Bats prey in all types of environment, but prefer caves, porticoes and abandoned buildings to rest, raise their young and go into torpor (a state of decreased physiological activity) when they can't find insects.



## Alone or in groups

Many bat species are sleeping by hanging from the roof, like horseshoe bats, which normally sleep alone by folding their wings around their body.

Other bat species, such as the bent-wing bat, squeeze in next to each other to warm up. Some bat species sleep in rock crevices, holes in walls or bridges, tree cracks, even the cracks behind detached tree barks.



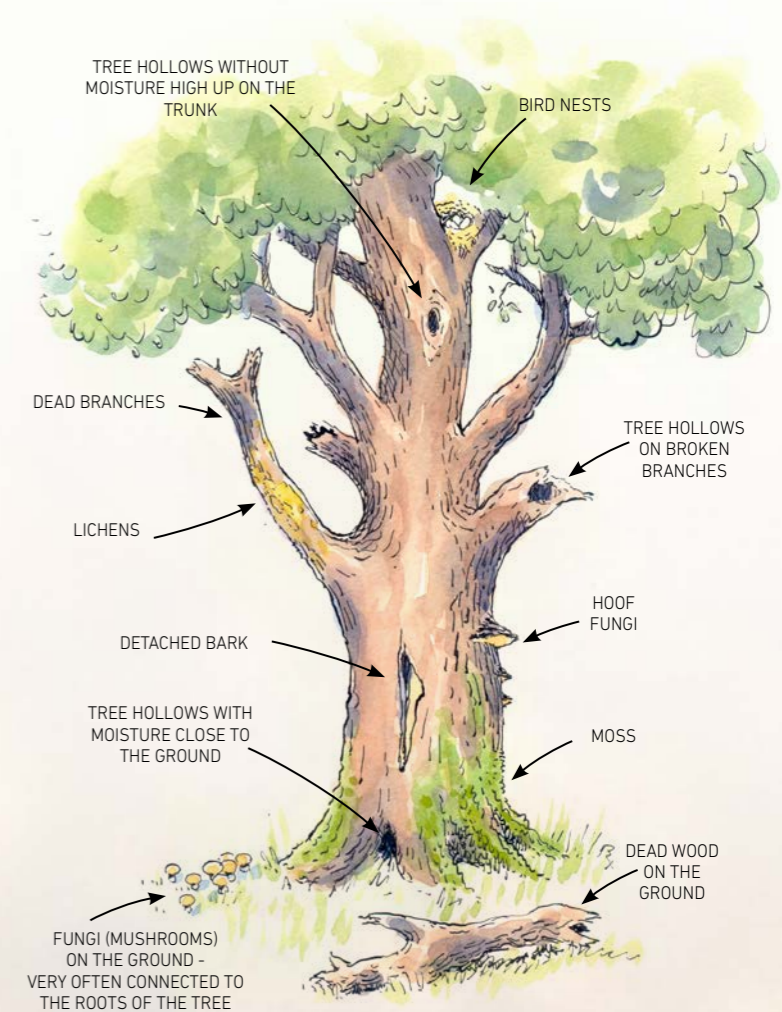


## Old trees and buildings serve as shelters

Many bat species hunt in meadows with trees or hedgerow fields (natural fences made of trees and bushes).

When there are no caves around, bats find shelter in old tree cracks, old buildings and abandoned porticoes.

Unfortunately, human activity destroys hedgerows, old trees and old buildings and eliminates insects as well (pesticides).



## Different bats in different environments

In Greece, there are 35-36 bat species which hunt during the night by using echolocation (sonar) and by listening to the echo from their short, high-pitched sounds (ultrasound).

Each environment combines different habitats and has different bat species (each of them with their own preferences):

1. Mosaic from trees/bushes and small meadows (horseshoe bats).
2. Forests with bushes or water (different myotis species hunt in foliage, bushes and the grass).
3. Open spaces and street lights (serotine bat).
4. Mediterranean habitats with broad-leaved trees (bent-wing bat).
5. Open sky (noctule bat).



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## The LIFE GRECABAT project monitors

By collecting scientific data (with visits by experts and advanced monitoring systems), we get to know which animals live inside each cave and whether they are threatened or not.



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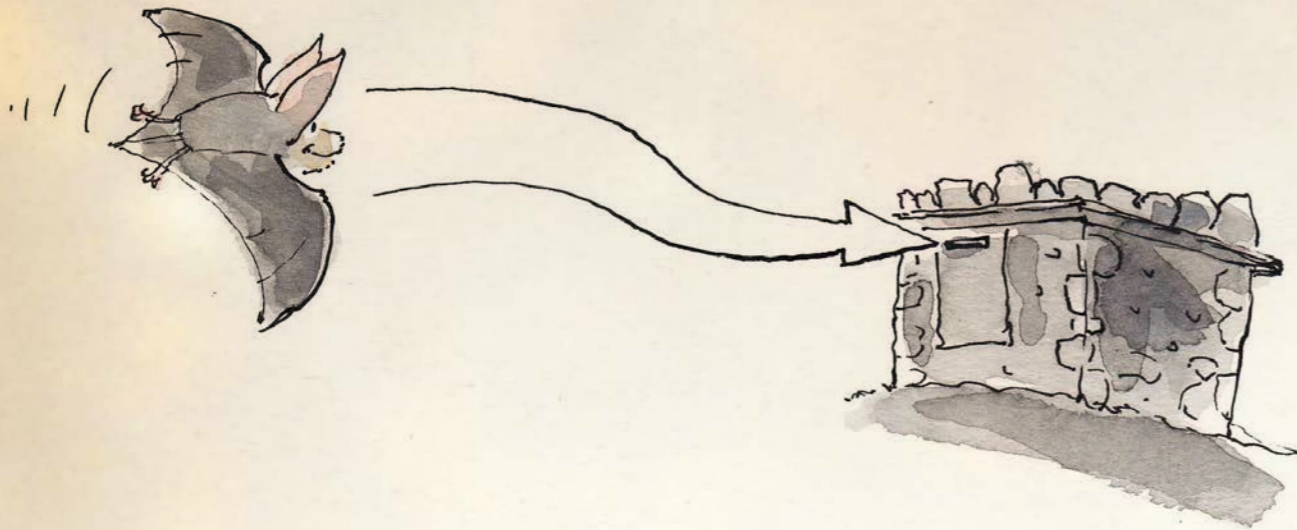
## The LIFE GRECABAT project collaborates

We are working together with speleology volunteers (citizen science) and we use a unique early warning system to identify problems before it is too late.



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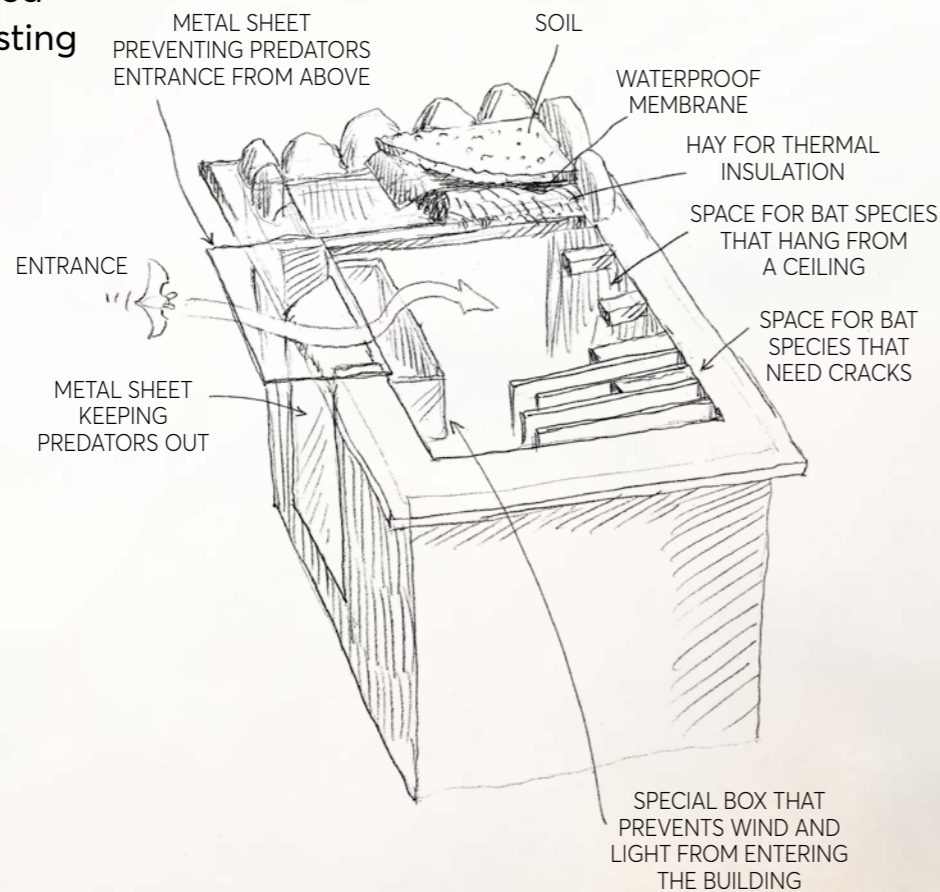




## The LIFE GRECABAT project leads the way

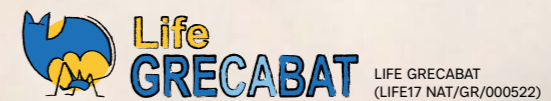
By placing appropriate doors at the caves and information signs for visitors, we allow the passage of bats and the survival of troglobites.

By repairing abandoned buildings and by adjusting suitable entrances, we create important shelters for the bats.



## The LIFE GRECABAT project informs

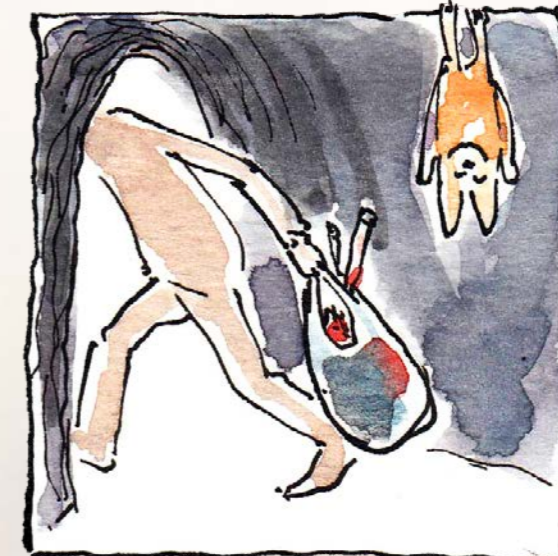
By promoting awareness through events, TV spots, publications and educational material, we aim to reduce the disturbance caused by the lack of knowledge around the caves.





### What can we do inside a cave?

- Let's stay near the opening of the cave in order to avoid disturbing the inhabitants inside.
- Let's limit the time we spend inside a cave in order to minimize disturbance to its inhabitants.
- Let's take our trash with us when we leave the cave.
- Let's not destroy stalactites! Let the next visitors enjoy them as well.



### What we should NOT do inside a cave?

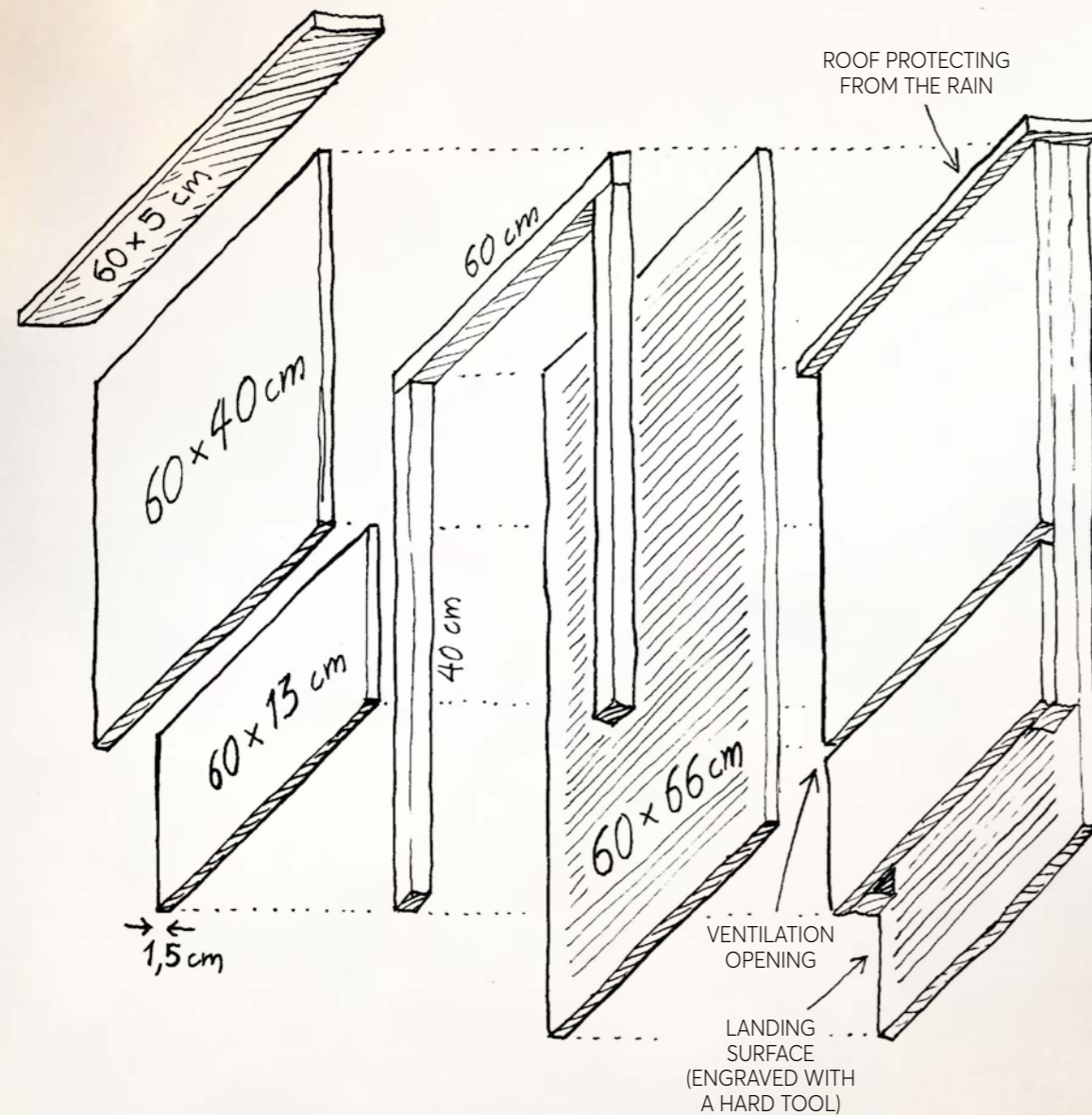
We should not disturb bats by making noise or using strong lights.

If we disturb them and make them fly away, they will waste valuable energy. If they don't find enough insects soon, they and their babies may not be able to survive.



## What can we do in our neighborhood?

- Let's use less insecticides, and leave insects for the bats.
- We can gather stones and branches at some places in order to create hiding places for the insects.
- We can leave some holes leading to the basement and under our roof so as to allow the bats to take shelter there.
- We can build a house for bats (bat-box) on the outer wall of our house.



«Greek Caves and Bats:  
Management Actions and Change of Attitude»

## How can we learn more?

For the LIFE GRECABAT project and the bats, you can visit the project's website:  
<https://www.lifegrecabat.eu/>



the project's facebook page:  
<https://www.facebook.com/LIFEGRECABAT/>



For cave-dwelling animals in each cave in Greece, visit the free-access database (<https://database.inspee.gr/>), which has been developed by the Hellenic Institute of Speleological Research.



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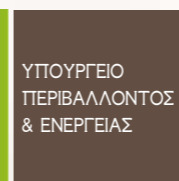
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