

LIFE15 NAT/ES/000757

Life
Tritó
Montseny



My name is
***Calotriton* and**
I only live in
Montseny!

Travelling exhibition on
the Montseny newt



**Diputació
Barcelona**



Diputació de Girona



**Generalitat
de Catalunya**



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#LifeTritóMontseny



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The authors take full responsibility for the information.

The LifeTritó Montseny project is an initiative aimed at improving the conservation status of the Montseny brook newt, tackling the factors causing its endangerment.

Life Tritó Montseny is co-financed by the European Union LIFE Programme. The project is carried out in the Natura 2000 Network site Massís del Montseny (ES5110001).

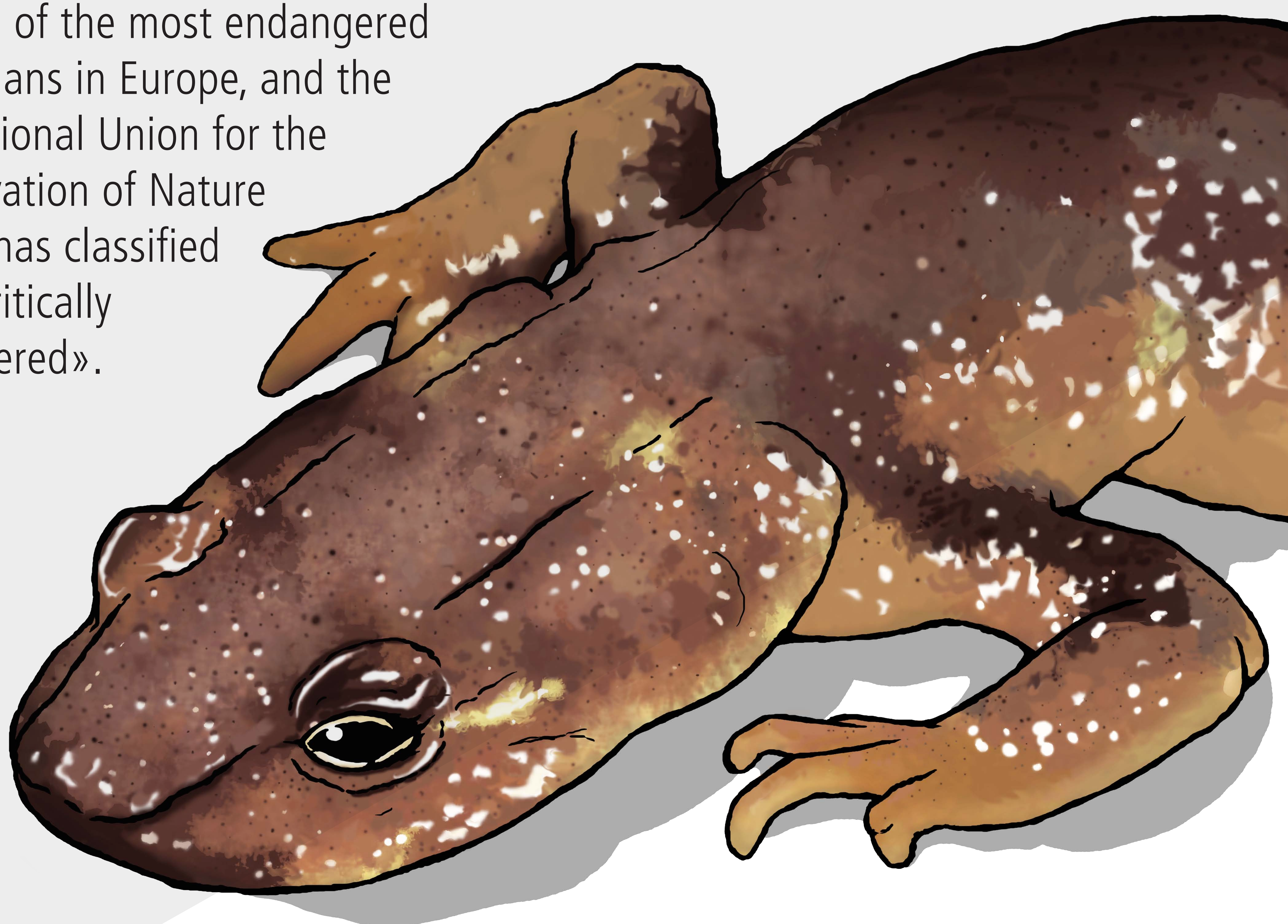


An exceptional and fragile organism

The Montseny brook newt (*Calotriton arnoldi*) is a unique organism that only inhabits Montseny. It's not found anywhere else in the world!

The Montseny brook newt lives in the most remote and best preserved corners of the Montseny Natural Park. Its population is scarce and the habitat it occupies is very small.

The survival of the Montseny brook newt is endangered by the impact of human activity. It is one of the most endangered amphibians in Europe, and the International Union for the Conservation of Nature (IUCN) has classified it as «critically endangered».



An enigmatic brook newt

Although it has inhabited Montseny for at least a million years, its existence was only recently discovered. And, even today, many aspects of its life continue to be a mystery to science.

1978

The existence of a new type of newt in Montseny, identified as Pyrenean newt, was documented for the first time.

1981

The first scientific publication appeared about the brook newts found in Montseny.

1990

Studies began to determine their distribution and state of conservation.

2001

In-depth studies were carried out on the populations. Differences were found with the Pyrenean newt.

2005

Its morphology and genetics were closely studied in collaboration with the London Museum of Natural History.

It was concluded that the Montseny brook newt is a new species (*Calotriton arnoldi*), endemic of the Montseny area and different to the Pyrenean newt.



What is the Montseny brook newt like?

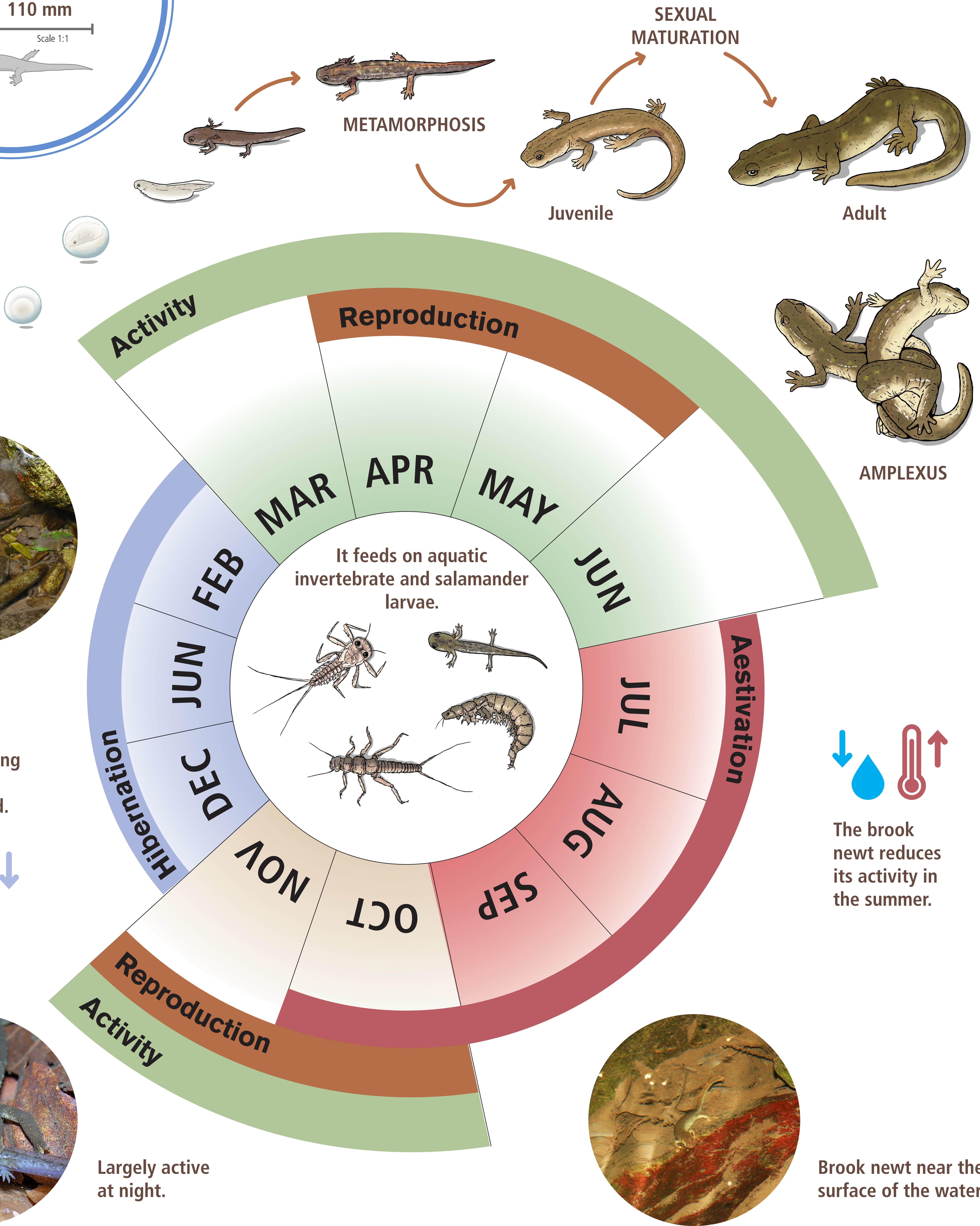
Montseny's brook newt is a urodele amphibian, meaning it has a tail, and belongs to the family of salamanders (*Salamandridae*).

- Brown-chocolate colouring, with pale yellow spots.
- Slightly flattened overall appearance.
- Translucent belly, with an ivory white spot on the throat area.
- Skin with wart-like bumps with a black keratin tip.



Biological cycle

The Montseny brook newt is an exclusively aquatic amphibian. All of the stages of its biological cycle take place under water.



Other salamanders that live in Montseny



Marbled newt
Triturus marmoratus
Frequent.



Palmate newt
Lissotriton helveticus
Not very widespread.



Salamander
Salamandra salamandra
Frequent.



Iberian newt 
Lissotriton boscai
Species introduced. It can transmit diseases and compete with indigenous species.

Where does the Montseny brook newt live?

The Montseny's brook newt is a very difficult organism to observe and study in nature. It lives in mountain streams, in remote and hard-to-reach places. It requires excellent environmental conditions to thrive: Very clean, cold waters that flow through well-structured woods.

The presence of the brook newt indicates that the ecological value of the habitat is high and well conserved.

BEECH TREES AND HOLM OAKS

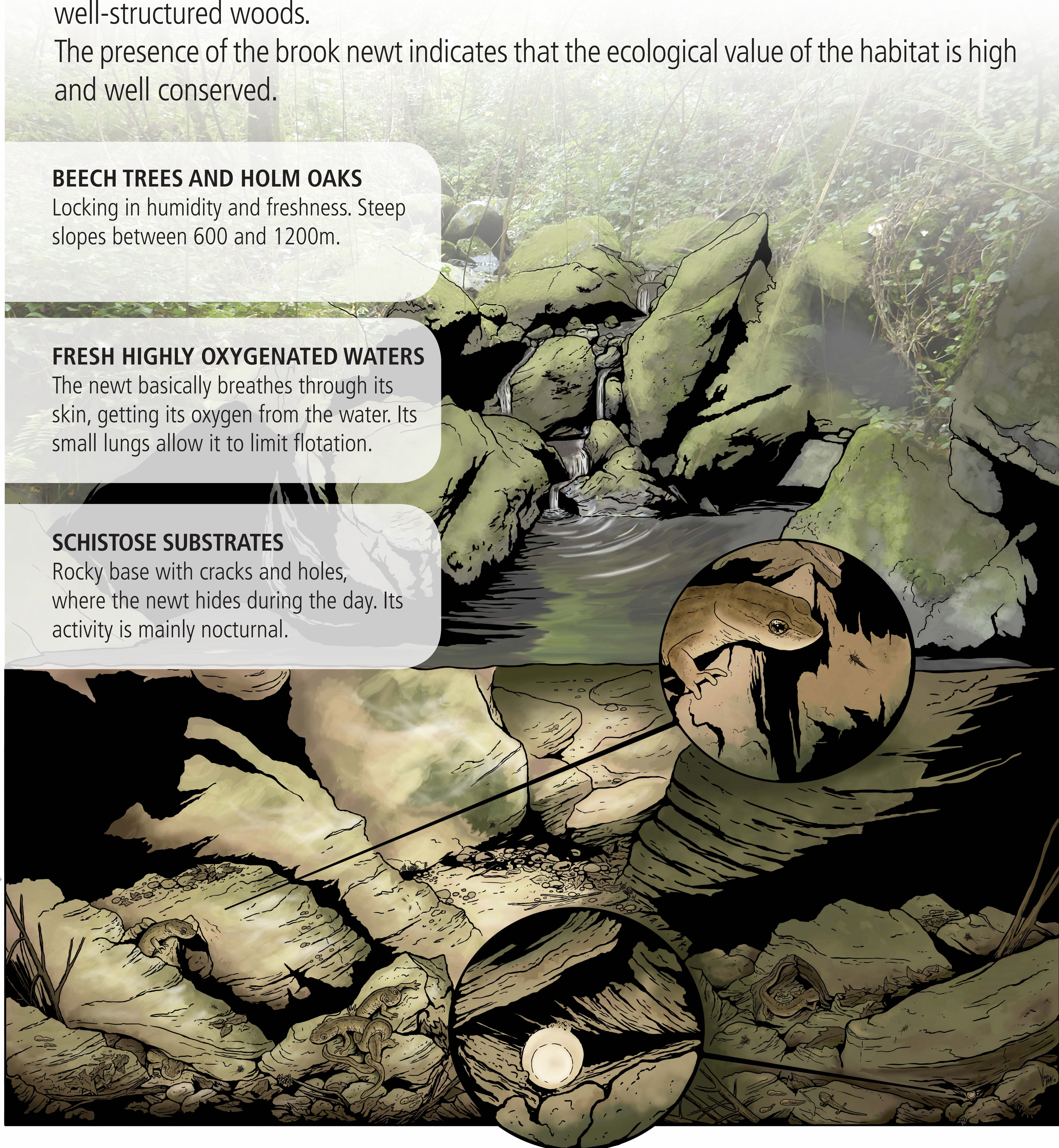
Locking in humidity and freshness. Steep slopes between 600 and 1200m.

FRESH HIGHLY OXYGENATED WATERS

The newt basically breathes through its skin, getting its oxygen from the water. Its small lungs allow it to limit flotation.

SCHISTOSE SUBSTRATES

Rocky base with cracks and holes, where the newt hides during the day. Its activity is mainly nocturnal.



What is the population of the Montseny brook newt?

< 1,500

adults

in a 5 km
stretch of stream

total area
8 km²

7

different
populations

4

eastern nucleus

3

western nucleus



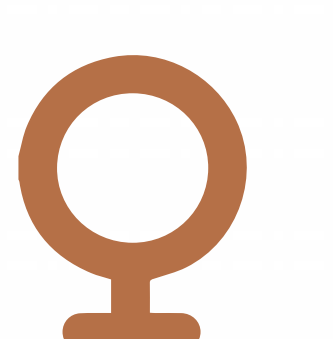
WESTERN POPULATIONS:

tip of the snout with ivory white pigmentation.



EASTERN POPULATIONS:

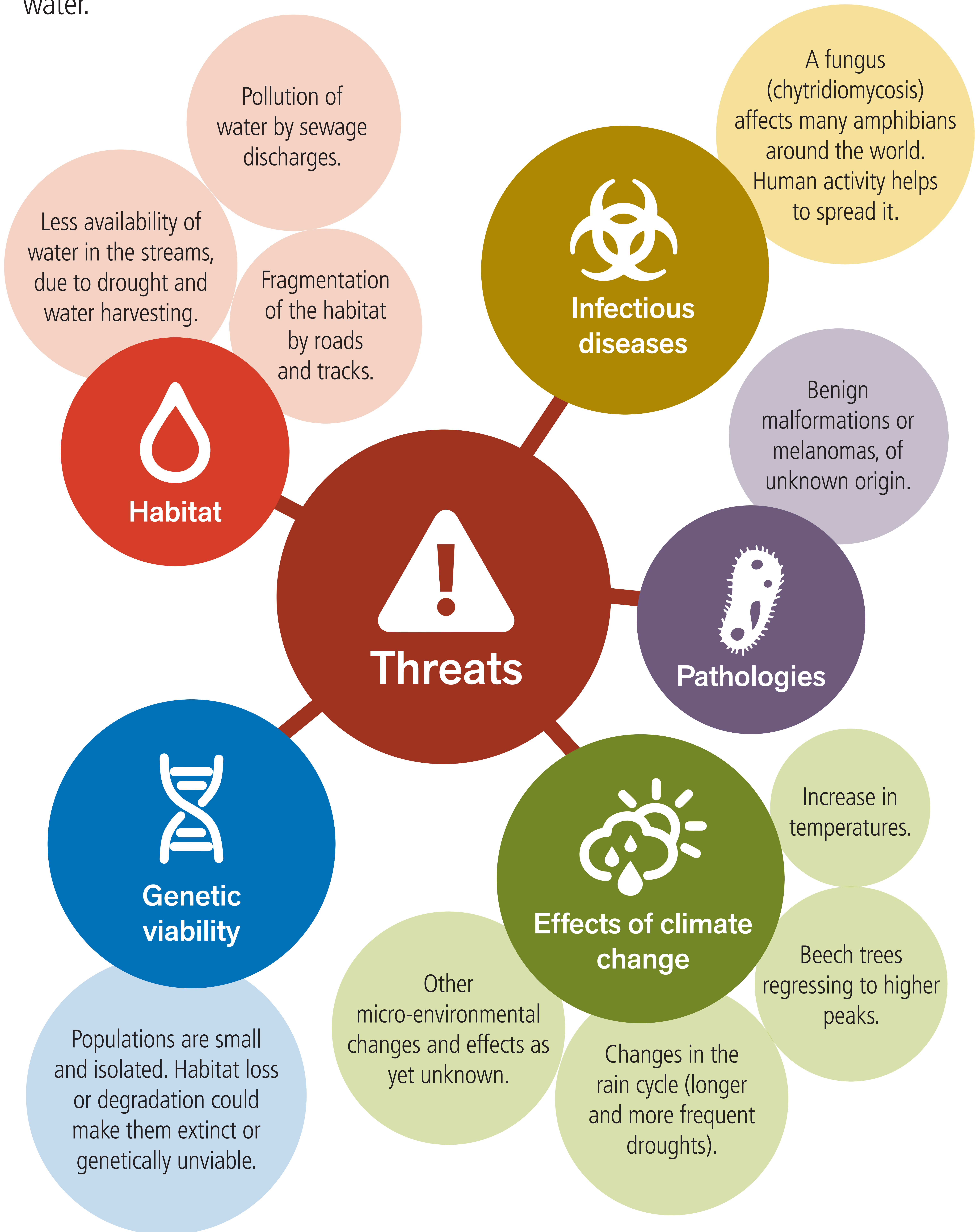
often with irregular pale yellow spots.



It is thought that populations split off about 250,000 years ago, coinciding with the occurrence of periglacial phenomena in Montseny. The annual cycles of freezing and melting would have caused the displacement of the populations as they sought out the optimum conditions, until they were separated into two groups isolated by physical barriers that prevented the crossover of individual newts.

Why is it endangered?

The Montseny brook newt is a species considered to be critically endangered: Its population is small, and its distribution, very limited. Furthermore, it is highly adapted to a very specific habitat and has very little dispersion capacity, since it only moves by water.



How do we work to ensure the conservation of the Montseny brook newt?

The **LIFE TRITÓ MONTSENY** project: benefits for the brook newt, benefits for everybody.

- Ensuring the quality of the aquatic and riverside habitat.
- Ensuring the viability of the brook newt populations by means of breeding and reintroduction programs.
- Expanding scientific and technical knowledge for management and conservation.
- Involving the agents of the territory in the conservation.
- Legally protecting the brook newt at national and European level.

How can we improve the habitat of the Montseny brook newt?

It is essential to ensure the good condition of mountain waterways because the brook newt finds everything its needs to survive there.



ISSUES

Reduced water flow in streams

Water harvesting can cause some stretches of stream to dry up, particularly when there has been a drought.

Discharging of polluted waters

This causes availability of nutrients to increase, affecting water physical and chemical conditions. Modifies communities of organisms.



ISSUES

Fragmentation of the habitat

By roads, forest tracks and paths that cross the waterways. They create barriers that the brook newt cannot cross.

Disappearance of riverside forests and replacement of indigenous forest with commercial plantations

The forest's regulatory function is halted: raising temperatures (reducing shade), increased erosion and dragging of sediment into streams.



LIFE TRITÓ MONTSENY ACTIONS



Improvement of harvesting systems (reduced losses, elimination of unnecessary consumption) to guarantee a minimum flow of water during the driest months.



Installation of water harvesting systems for rainwater and for the reuse of grey water.



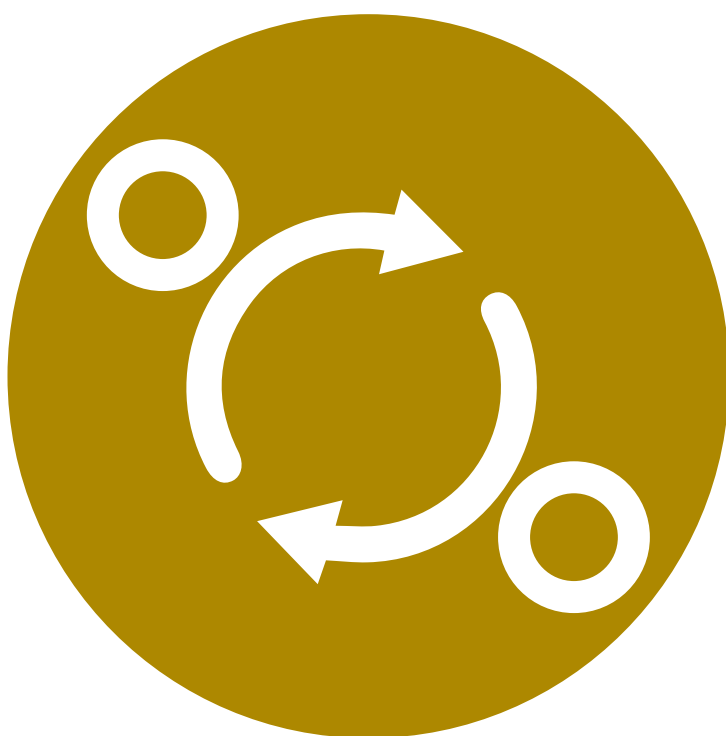
Installation of purification systems, such as artificial lakes (green filters), where vegetation purifies waste water.



Installation of culverts that maintain the flow conditions in the places where the tracks and roads cross the streams.



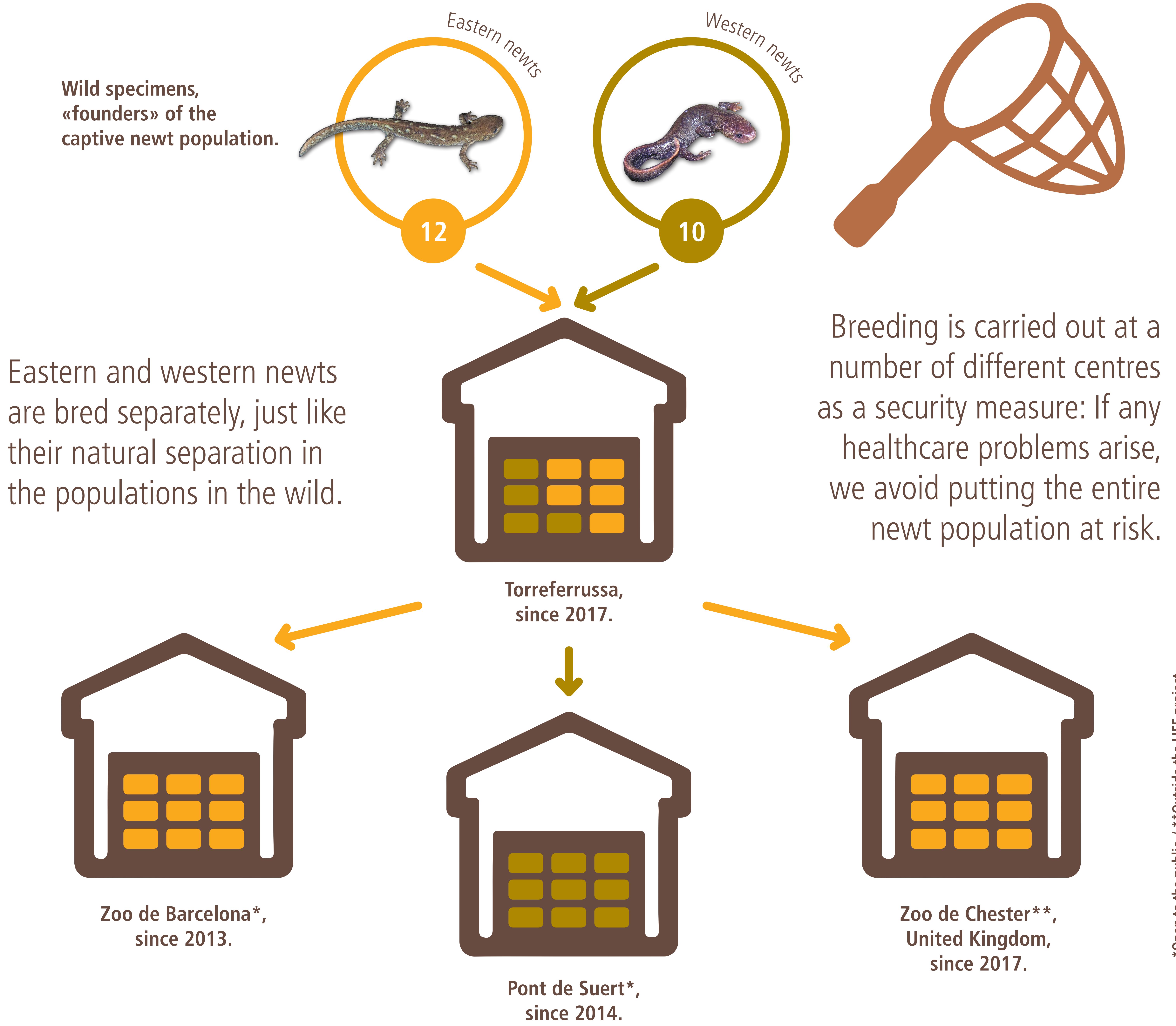
Restoration of riparian habitats to recover indigenous vegetation and halt erosion processes.



Cooperation with the players in the area is essential

Brook newts bred in captivity

The captive breeding program allows, on the one hand, a genetic reserve to be held outside of nature (to deal with possible catastrophes) and, on the other hand, it enables natural populations to be reinforced and distribution to be broadened by the introduction of brook newts bred in captivity.



Aquariums simulate the environmental conditions of the Montseny mountain streams. Keeping brook newts in captivity allows us, moreover, to learn more about biology and ecological needs.

Genetic wealth is essential: in addition to the genetic diversity of the populations, more capacity to adapt to changes in the environment.



Inbreeding must be avoided. To know for sure which are the parents of each specimen, each mating pair is kept separate from the others. Females keep sperm from different mating sessions for more than a year and they could mate with different males during this time.

Computer programs are used to find out which are the best mating pairs to ensure genetic variability.

LIFE TRITÓ MONTSENY ACTIONS



Determining the genetic variability of the breeding population and exact parent-offspring pairings with genetic techniques.



Improvement of brook newt breeding protocols. Study and solution of issues such as premature larvae death and infertility.



Installation of temperature and humidity sensors in the mountain streams where the brook newt lives, to reproduce the daily and seasonal environmental variations in breeding aquariums. Experimental study of the impact of climate change on the brook newt.



Enlargement of the breeding centres in Torreferrussa, Barcelona Zoo and Pont de Suert to increase the genetic reserve and the number of Montseny brook newts that can be released.

New populations of Montseny brook newt

Some of the brook newts born in captivity will be used to start new populations in Montseny, in mountain streams with ideal living conditions, but where there are currently no newt inhabitants.



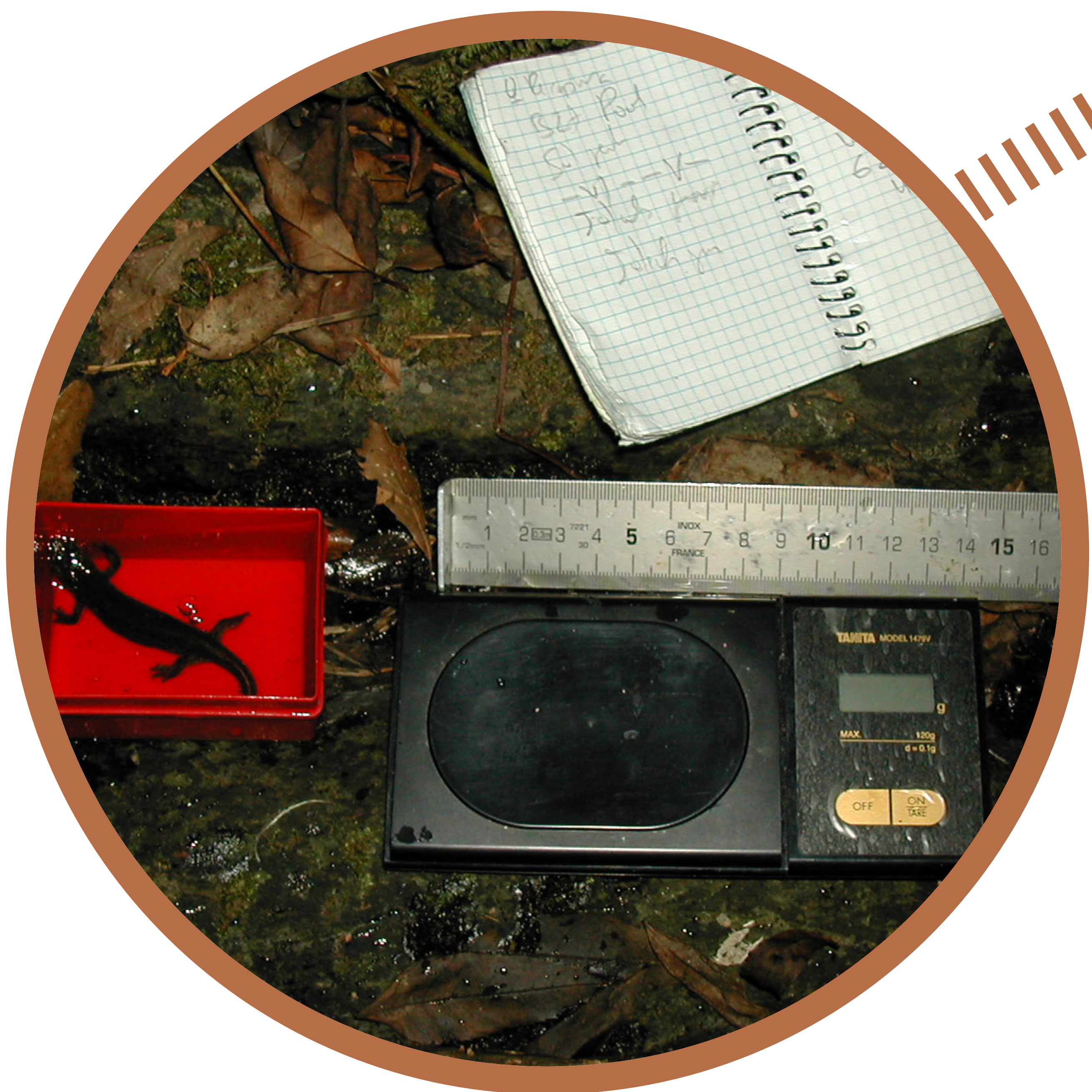
Prior to the Life Tritó Montseny project, captive brook newts had already been released in order to evaluate survival.



Brook newts of different age groups are released in spring and autumn, when mountain streams have more water flow and they have more chances of finding shelter and resources to survive.

They are released at night in order to facilitate their adaptation to the new environment.

Before introducing them into the environment, it is verified that they are completely healthy and that they will not bring any diseases into the natural population.



They are marked with an easily visible and harmless subcutaneous implant, which allows for subsequent follow-up: The following spring the team checks how many newts have survived and if there were any births in the new habitat.

Monitoring for infectious diseases

Amphibians around the world are threatened by the spread of certain infectious diseases that cause massive mortality in some populations and even the extinction of species: **Chytridiomycosis**, produced by a fungus, or **ranavirus**.

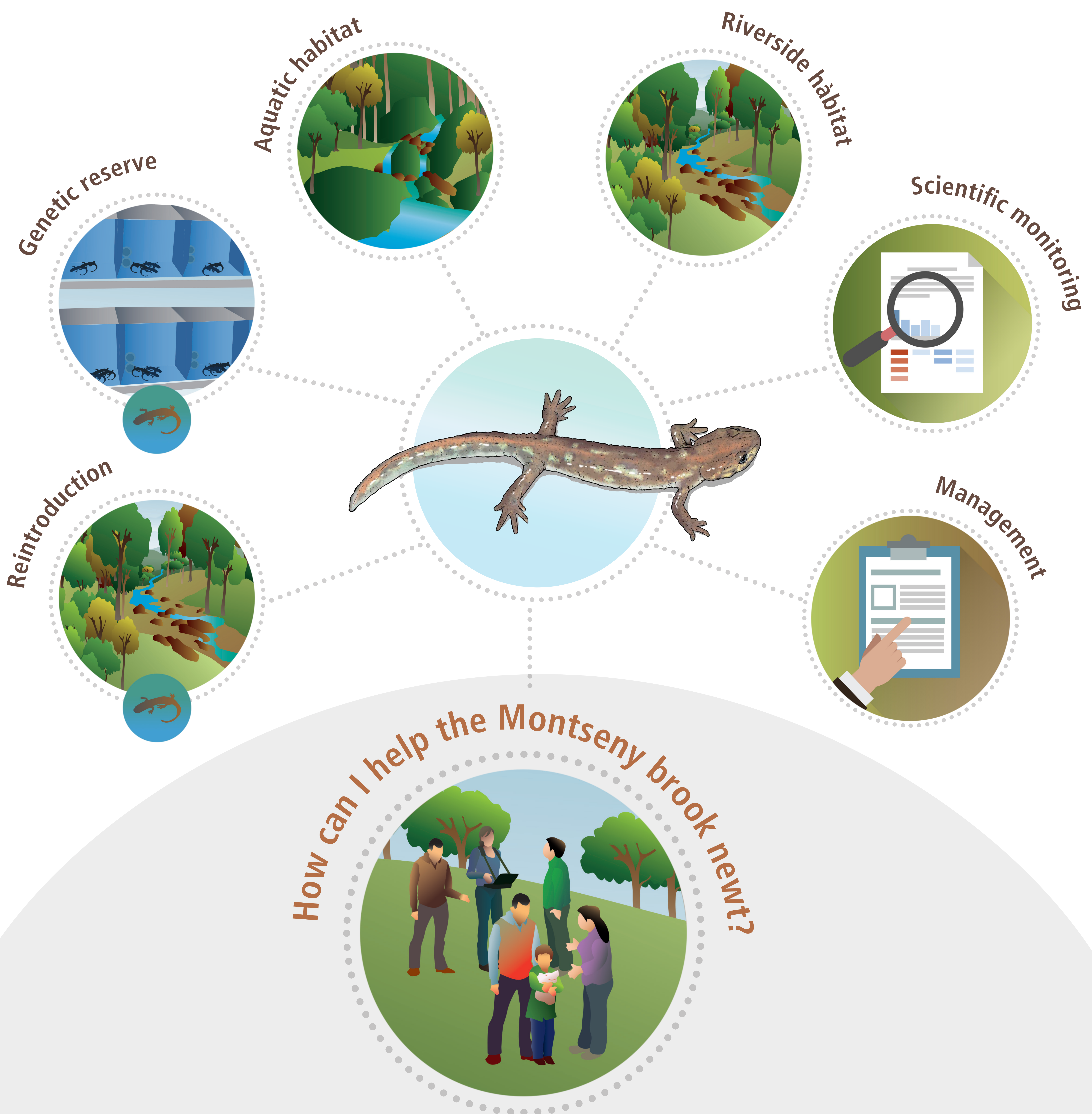
This is why health status testing is carried out on populations of brook newt and other amphibians living there: the salamander and the common toad.

Although not yet detected in Montseny, cases of chytridiomycosis have been found in nearby areas, which means that there is a real risk of infection. For this reason, it is necessary to keep up a continuous monitoring program.



Everyone can contribute!

The Montseny brook newt is a little great exemple of Montseny's rich natural heritage. Through Life Tritó Montseny project, we aim at improving its population and habitat, but everyone can help out!



- Make rational use of water, reduce water consumption in the home as much as possible.
- Consume tap water instead of bottled water.
- Use rainwater or reused water to water your garden, your allotment, etc.
- Keep rivers, streams and basins free of waste and scrap.
- Avoid wading in mountain streams and rivers: this can alter the water, shift sediments and may damage eggs and larvae... We should make sure our dogs don't do it either!
- Respect the riverbank's indigenous vegetation.
- Visit the Montseny brook newt at Barcelona Zoo, where we can see what the adults and larvae look like close up. The brook newt is very difficult to find and observe in nature, and it is very possible that we would alter their habitat if we went too far.
- If you come across other amphibians, observe them without touching or disturbing them, and under no circumstances should you remove them from their habitat. They are very fragile organisms! What's more, we could contribute to the spread of diseases that could seriously harm them.
- Don't release animals into streams or river basins, especially if they are exotic animals: fish, river crabs, Florida turtles, etc. This is very important.
- Drive or cycle at slow speed on the tracks and roads of the Montseny area and watch out for animals that could get run over, especially when it's raining.
- Reduce our contribution to climate change.