

From trap to safe zone - How geosynthetics turned a technical reservoir into a wildlife-friendly solution

Amphibian ascent

- **Project name**
Amphibian Ascent in Montserrat Natural Park (Bruc, Spain)
- **Client**
Solucions, Enginyeria i Medi Ambient, Manresa, Spain
- **Contractor**
Excavacions Silvestre Ginferrer S.L., Castellbell i el Vilar, Spain
- **Product**
Secumat® Eco 601 G4





Fig. 1: Vegetated bridge of erosion control mat



Fig. 2: Retention basin before using Naue Secumat® for passage

When wildlife meets technical water storage

In the picturesque municipality of Bruc near Barcelona, the construction of a water reservoir brought a design challenge: how to prevent amphibians and small animals from becoming trapped inside. Although the 773 m² reservoir was enclosed by a protective fence against boars and roe deer, concerns remained that some fauna could slip through and be unable to escape.

With a maximum water depth of 4 metres and a total storage capacity of 1,866 m³, the steep inner slopes of the basin - lined with a 1.5 mm HDPE geomembrane and protected underneath by a 200 g/m² nonwoven geotextile - offered no foothold or natural way out. For small creatures like rabbits, partridges, hares, foxes, snails and amphibians caught inside, the basin could easily become a death trap. The client wanted a long-term, passive evacuation system to protect the local ecosystem.

A path that makes a difference

The engineering team chose to approach the challenge with simplicity and foresight. They proposed a robust, maintenance-free escape path by installing Naue Secumat® Eco 601 G4 along one of the slopes, stretching from the top edge down to the bottom of the reservoir.

Designed to withstand harsh environmental conditions, Secumat® Eco provided three key advantages:

- Reliable grip for paws, claws and webbed feet thanks to flexible monofilaments and an open 3D mesh structure
- Long-term UV stability due to carbon black additives used during production
- Visual and functional harmony with the underlying HDPE geomembrane

To enhance durability and performance, the mat was secured using metal rods to prevent it from floating, even when submerged. The durable product with 1.1 mm-thick randomly oriented endless filaments permanently supports the passage.

This smart slope treatment ensures that even if a frog periodically crosses or small mammal falls into the basin, it has a safe and instinctive way to walk back out - without damaging the reservoir's sealing or compromising its storage capacity. This passage can be planned along the entire slope of the basin, after it proved effective and was accepted by local wildlife.

Engineering with empathy

This project shows how even the most technical structures can be designed with empathy in mind, integrating nature-friendly solutions based on project-specific conditions. By integrating high-performance geosynthetics like Secumat® Eco, the Bruc reservoir not only fulfills its water storage function - but also contributes to biodiversity and animal safety.

A small intervention with a big impact: nature stays safe, the structure stays strong. That's smart engineering in action.