LIFE RENATURWAT

Improving biodiversity, one of the pillars of LIFE Renaturwat.

As we have told you in previous editions of our newsletter, the LIFE Renaturwat project is based on three fundamental pillars:

- Renaturalising treated water: improving its physico-chemical quality but also its biological richness.

- Valorising a waste product to achieve the previous objective, namely the sludge from drinking water treatment plants, thus incorporating the principles of the circular economy into the urban water cycle.

- Improving the biodiversity of the environment surrounding the wastewater treatment plants.

In this newsletter we will focus on the first and third pillars. Read on to find out what we have done to improve the biodiversity of treated water and the environment.

The actions implemented to improve biodiversity are:

1.- Construction of purpose-designed surface flow wetlands. The design was carried out by a multidisciplinary team made up of civil engineers, hydraulics, chemists, biologists and environmentalists. A wetland designed of improving water quality and biodiversity should have the following main characteristics:

- Gently sloping inlets to facilitate the entry and exit of amphibians and reptiles.
- Areas of varying depths to create diverse environments.
- Islands that can be used by amphibians and reptiles for sunbathing or by birds for nesting.
- These islands can also favour a good distribution of water.
- Helophytic and submerged vegetation, for their purifying role and to create habitat for aquatic invertebrates or amphibians.

2.- Planting of flowering and aromatic vegetation in the surroundings, accompanied by insect hotels, to create suitable habitats for beneficial insects, such as pollinators or pest predators.

3.- Installation of bat nest boxes. Bats can consume huge amounts of insects, up to 1200 mosquitoes per hour, thus helping to control the mosquito population.

4.- Maintenance of bare soil areas in wet conditions, so that birds such as house martins and swallows can take up the mud they need to build their nests..

5.- Installation of amphibian shelters, built with natural materials from the site.

6.- Installation of information panels on the danger of invasive species and prohibition of introducing them in the wetlands.

7.- Collaboration with the Centre for the Conservation of Freshwater Species of the Valencian Community (CCEDCV) to support conservation programmes for species included in the Valencian Catalogue of Threatened Fauna Species.

Let's take a closer look at this last action.

In order to demonstrate that the wetlands created within the project could become sanctuaries for biodiversity, the partner Fundación Global Nature consulted the CCEDCV about the possibility of collaborating in one of its species recovery programmes.

The CCEDCV technicians visited the wetlands created at the Wastewater Treatment Plant (WWTP) of Valle Residencial Los Monasterios (Puçol, Valencia). Based on the characteristics of the wetlands and the area, they recommended working with a species of amphibian, the Iberian ribbed newt (Pleurodeles waltl), which is classified as vulnerable in the Valencian Catalogue of Threatened Fauna Species.

In her report, Pilar Risueño, head of the CCEDCV (Dirección General de Medio Natural y Animal de la Conselleria de Medi Ambient de la GVA), concluded: 'the area of action is approximately 3 km from La Muntanya del Cavall, where there are historical records of the species, but where it has unfortunately disappeared in recent years due to the drying up of the ponds where it was present. Therefore, the creation of a population nucleus in the ponds of the WWTP would allow the species' presence grid to be recovered'.

The Muntanya del Cavall, in Albalat del Tarongers (Valencia), is a flora microreserve declared in 2002, which had an endorheic lagoon with good water quality (Flora Microreserves - Muntanya del Cavall, GVA).

Then a collaboration began through which around 80 specimens of Iberian ribbed newt have been introduced in the wetlands of the LIFE Renaturwat project, located in Los Monasterios (Puçol) and in Carrícola. The specimens introduced in Carrícola were provided by the Oceanogràfic Foundation, which also collaborates with the CCDCV in the species recovery programme.

The introduction of this species also provides a great ecosystemic service to the project, as both larvae and adults feed on aquatic insect larvae, small animals that fall into the water, carrion, amphibian larvae, crustaceans, annelids, etc., even cannibalism is very common. Therefore, they play a very important role in controlling the mosquito population.

Below the dates and number of individuals introduced are indicated:

- 22 March 2023 (celebration of World Water Day): 17 individuals that were distributed in the wetlands implemented in Los Monasterios.
- 15 June 2023: introduction of 8 specimens in the wetland fed with treated water from the Carrícola WWTP.
- 4 July 2023: reinforcement of the introduction at Los Monasterios, with 31 more specimens.

- 22 March 2024 (celebration of World Water Day): reinforcement of the introduction programme at Los Monasterios, with 22 additional specimens.



But how do we know if all these actions are succeeding?
The monitoring of all the actions is fundamental to demonstrate the fulfilment of the objectives. For this reason, several environmental variables have been monitored: the community of aquatic invertebrates, the population of flying insects, birds and amphibians. Please, continue reading to discover the most interesting results.

Aquatic invertebrates
The results of the aquatic invertebrates monitoring make it possible to obtain indices that reflect the quality and complexity of the biological community of these invertebrates in the constructed wetlands. These indices show that, in the wetland fed with water from the vertical flow wetland filled with drinking water treatment sludge, which is of better quality, a more diverse macroinvertebrate community has developed, with a greater number of taxa and representative groups, and with a greater number of dominant groups.


Flying insects

To date, a total of 9,482 insects have been identified, divided into 55 families. These families, divided into functional groups, have resulted in 15 families of predators, 11 families of phytophagous insects, 22 families of parasitoids, 5 families of pollinators and 2 families of saprophagous insects. These results indicate that beneficial insects are well represented.

Do you know what beneficial insects are?

They are insects that provide us with essential benefits or services, either in terms of food production, for which pollinating insects are essential, or in terms of crop protection, where predatory or parasitoid insects play a very important role in controlling pests in a natural and sustainable way.

Birds

Up to 22 species of birds have been observed in the Los Monasterios wetlands and 25 species in Carrícola. These birds use the habitats created to feed or rest on their migratory routes. For the moment, nests have not been observed, possibly due to the small size of the created wetlands, but they have been observed in the surrounding area. One example is the construction of nests by the common house martin, a migratory passerine bird that can be seen in our territory in spring, summer and autumn. These small birds use the mud available in the surroundings of the wetlands to build their nests in nearby buildings.

The birds with the greatest presence in Carrícola and Monasterios were wood pigeon (*Columba palumbus*), magpie (*Pica pica*), blackbird (*Turdus merula*), house sparrow (*Passer domesticus*), white wagtail (*Motacilla alba*), robin (*Erithacus rubecula*) and serin (*Serinus serinus*).

Petirrojo europeo.

Pere Altabert (Carrícola).

Abubilla

Pere Altabert (Carrícola).

If you want to know more curiosities about the birds and other flora and fauna that inhabit these wetlands, we invite you to visit our flora and fauna guide:

Interactive version: https://fundacionglobalnature.org/guia-de-flora-y-fauna-en-humedales/

Pdf version: https://liferenaturwat.com/wp-content/uploads/2023/09/FGN_guia_renaturwat_2023_BAJA.pdf

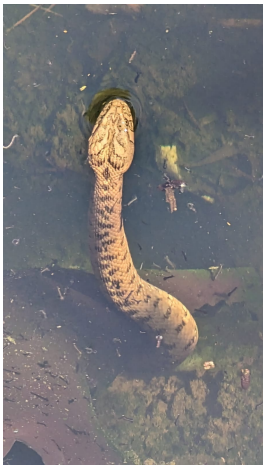
Bats

Nest boxes installed in the vicinity of wetlands have not yet been occupied by these allied mammals. It is known that it takes quite a long time for occupation to take place, which can be observed by observing droppings or traces of urine leaving dark or yellowish stains on the boxes. We will follow these signs closely...

Reptiles

A water snake (Natrix maura) has been observed inhabiting the surface flow wetland of Carrícola, as well as small lizards around the wetlands of

Los Monasterios.



Anfibios

The monitoring of amphibians has been qualitative, with a significant number of common frogs (*Pelophylax perezi*) and common toads (*Bufo bufo*) or runners (*Epidalea calamita*) observed in the surface flow wetlands, as well as some individuals in the subsurface flow wetlands.

In the case of the Iberian ribbed newt, it is more difficult to observe them during monitoring visits, as they are discreet animals, which tend to remain hidden during the day. In order to see if the releases had been successful, on 28 February 2024 a net sampling was carried out to see if they were still present. An adult male was seen in the breeding phase, which is a great success, as its survival, its permanence in the wetlands and its intention to reproduce was confirmed.

I SUSCRIBE

We remind you of our website and social networks:
There you can find out in more detail what we are doing and will do in the project.

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