

# NATURE-BASED SOLUTIONS

*Evidence-based research findings from Tour du Valat*

FACT SHEET 1

## PASSIVE RESTORATION OF THE TOURTOULEN RIVERINE WOODLAND

#wetlands #riverinewoodlands  
#passiverestoration #protection

📍 **Location:** Camargue, South of France  
🌳 **Habitat:** Riverine woodland (riparian forest)



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### 🌿 ALLOWING ECOSYSTEMS TO DEVELOP FREELY

The goal is to allow nature to recreate ecosystems freely, in some cases after a phase of active restoration (e.g., after replanting species that had disappeared). It may also involve progressively decreasing human intervention.

### TOURTOULEN RIVERINE WOODLAND

The **Tourtolen riverine woodland** is a riparian forest along the Great Rhône River. This riverine woodland (alluvial forest), made up especially of white poplars and ash trees, belongs to the **French coastal protection agency**. The **Tour du Valat** and the **French National Forest Office (ONF)** co-manage this area. The ONF implements measures related to forestry operations, while the Tour du Valat is in charge of monitoring how the natural habitat evolves. At the present time, the management measures do not provide for any interventions, because the goal is to let the vegetation evolve naturally toward a diversified forest population. This approach is called “**passive restoration.**”



## THIS PROJECT RESPONDS TO CHALLENGES FACING SOCIETY



### » Floods

**Limiting the risk of flooding** by creating a water storage/absorption zone and slowing down the flow of water, which reduces pressure on the infrastructure such as dikes, and decreases the flood peak.



### » Water quality

**Improving water quality** by filtering pollutants such as fertilizers and pesticides that can be fixed by the plants and micro-organisms in the soil, which can limit how much they spread in the water.



### » Climate change

**Storing carbon** in the vegetation and in the soil, while contributing to the **sequestration of the CO<sup>2</sup>** already emitted. Providing shade, which results in **lower temperatures in summer**, improves the oxygen content of water, and limits eutrophication.



### » Environmental degradation

**Protecting and maintaining the banks** while limiting erosion by means of tree roots. **Providing habitats in good state of conservation for biodiversity.**



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## ECOSYSTEM-BASED APPROACHES EMPLOYED

### » Ecosystem-based management

This kind of management aims to support the restoration of the riparian zone and monitor its good health (e.g., diversity in species composition) to ensure its long-term resilience.

### » Ecosystem-based adaptation and mitigation

Restoration enables the riparian zone to improve its long-term capacity to store greenhouse gases (CO<sup>2</sup>), which attenuates the effects of climate change.

### » Reducing natural risks

Functional riparian forests will provide protection that reduces the risks linked to natural disasters such as floods.

## ADVANTAGES OVER CONVENTIONAL APPROACHES

*Flood protection infrastructure (construction of dikes, protective walls, retention basins or valley dams) is not as adaptive and resilient as natural solutions to respond alone to the problems linked to climate change. The conservation or restoration of wetlands such as riparian forests or riverine forests for their "buffer" services in case of floods or droughts and their reconnection to rivers is a perfect example of a Nature-based Solutions that also helps to preserve valuable ecosystems.*



## HOW TO CARRY OUT PASSIVE RESTORATION ACTIVITIES ”

The Tour du Valat monitors the structure of the biodiversity in this forest, in order to evaluate any dysfunctions and/or needs for intervention.

## BENEFITS FOR BIODIVERSITY

### The Tourtoulen Woods:

- » Provides **habitat** that ensures significant biodiversity of fauna and flora including **typical nesting birds of alluvial forests** such as the Black Kite, several species of woodpeckers, and the European Roller.
- » Serves as a **migratory stopover** and biological corridor for many species of birds (passerines, hawks...) and chiropters.
- » Hosts **mammals** uncommon in the Camargue (such as Beaver and Martens) and bats of high heritage value (the Greater Horseshoe Bat and the Notched-ear Bat).
- » **Functions as an biological corridor** that enables species to move freely. The riparian zone thus contributes to maintaining biodiversity and provides habitat for a rich fauna and flora, such as forest nesting birds.

## ECOSYSTEM SERVICES PROVIDED BY RIPARIAN ZONES

### » Supporting services

Preservation of biodiversity • Habitat for species • Creation of soil • Water cycle • Matter cycle

### » Provisioning services

Water • Fire wood • Genetic resources

### » Regulating services

Climate • Air quality • Water flow • Erosion • Ecosystem health • Natural risks

## LESSONS LEARNED

- » *Management objectives that advocate non-intervention can be effective and less costly.*
- » *Monitoring of the forest structure shows that the Tourtoulen riparian forest is in a transitional phase due to the ageing of its dominant species (white poplars). This transition will lead to a greater diversity of plant communities.*
- » *The passive restoration approach could enable other degraded riparian zones to regain their functionality with limited interventions. Nevertheless, regular monitoring of the forest structure will make it possible to define the need or not to intervene.*



## TARGETED SUSTAINABLE DEVELOPMENT GOALS

6 CLEAN WATER AND SANITATION



11 SUSTAINABLE CITIES AND COMMUNITIES



13 CLIMATE ACTION



15 LIFE ON LAND



## INFORMATIONS

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## TECHNICAL PARTNERS:

- » French coastal protection agency
- » French National Forest Office

## FINANCIAL PARTNERS:

- » French coastal protection agency
- » Bouches-du-Rhône department
- » PACA region

## WHAT ARE NATURE-BASED SOLUTIONS?

Nature-based Solutions (NbS) are "actions to **protect, sustainably manage, and restore natural and modified ecosystems** that address **societal challenges** effectively and adaptively, simultaneously providing **human well-being and biodiversity benefits**". They also provide ecosystem services and contribute to achieving sustainable development goals by enhancing biodiversity. NbS are effective, flexible, technologically diverse, and economically viable. They provide an opportunity to increase the resilience of societies to climate change and will facilitate our transition toward a more sustainable and inclusive economy.



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