TOUR DU VALAT

ACTIVITY REPORT 2023

Tour du Valat

Research institute for the conservation of Mediterranean wetlands

THE TOUR DU VALAT TEAM

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EDITORIAL

YESTERDAY AND TOMORROW

1954. Luc Hoffmann realised a dream by establishing a unique place devoted to science in the heart of the Camargue, on the "Tour du Valat" estate, a combination of farmland as well as vast areas of marshland and Mediterranean salt scrub, which he had acquired a few years earlier. Guided by his passion for birds and fervent desire to understand and decipher the relations between living organisms, he made this founding act at a time when knowledge of ecosystems was still in its infancy and hardly linked to action. At this time, budding nature conservation activities were being carried out against humans.
His was a profound commitment, a superb utopia, a human adventure that he never imagined would develop in such remarkable ways.

2024. On the wings of these seven decades of action, experimentation, success, and sometimes failure, today the Tour du Valat benefits from international recognition for its expertise, and is respected and influential through the institutional, but perhaps most of all human networks it has created. From this remote corner of the Camargue, initiatives have emerged that have irrigated the entire Mediterranean Basin and far beyond.

Just when the Mediterranean Basin seems to be at the center of major world tensions – from armed conflicts to major climate change events and desperate migration – it's up to us to come up with solutions that are concrete and operational, even if they seem small compared to the colossal challenges.

Because the Tour du Valat's achievements over the past 70 years constitute a formidable capital for the future, in 2023 we undertook a strategic and organizational forward-looking process with the participation of all Tour du Valat employees and governing bodies. Through this process we co-constructed a vision for the next 15 years, a compass for navigating in an uncertain world. This vision is both the promise of constantly renewed expertise, which can meet future challenges, and a commitment to strengthen collective action, so as to attract the support of more men and women who will ensure that wetlands continue to be an essential link in the chain of biodiversity and human well-being.

A utopian goal, general interest as our guiding principle, science as the foundation, and commitment as the driving force for our actions. Such has been the alchemy at play at the Tour du Valat for the past 70 years, and will be for many more to come.

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ANDRÉ HOFFMANN
PRESIDENT

JEAN JALBERT
DIRECTOR GENERAL

THE TOUR DU VALAT

Created 70 years ago by the visionary naturalist and philanthropist Luc Hoffmann, the Tour du Valat has developed its research activities for the conservation of Mediterranean wetlands with the constant desire to achieve better understanding for better management. Convinced that it will only be possible to preserve wetlands if human activities and the protection of natural heritage can be reconciled, the Tour du Valat has for many years been developing research and integrated management programmes that favour exchanges between wetland users and scientists, and promote wetlands benefit to decision makers.

OUR ORGANISATION

The Tour du Valat is a non-profit foundation with two management bodies that handle its governance: the Board, made up of three colleges – the Founders, Ex-officio members, and Qualified personalities – and the Science and Conservation Council, a body of internationally acclaimed scientists from major fields of wetlands research and conservation.

OUR LIFEBLOOD

The Tour du Valat team included 101 talented individuals in 2023 (including 2 apprentices) with an additional 7 doctoral students hosted on a non-contractual basis (4 women and 3 men), which in all represents 81 full-time equivalent positions (36 women and 45 men).

Five volunteers in European Solidarity Corps of Spanish, Georgian, Finnish, Portuguese and Italian nationality left during the year and five more joined us (from Italy, Belgium, Netherlands, Greece and Germany). Eight volunteers from Service Civique volunteers took an active part in the work of the scientists, the Domaine du Petit Saint-Jean and the communication team.

Finally, as is the case every year, we offered nine university or engineering school students the opportunity to complete their internship with us, thereby continuing to strengthen the scientific culture at the Tour du Valat.

Outing with our gardian Julien Bourjaillat during our open days
© Tour du Valat

1954
FOUNDED BY LUC HOFFMANN

101
EMPLOYEES

1 685 scientific
PAPERS PUBLISHED

103
PhD

PROJECTS IN
+ THAN 20
MEDITERRANEAN
COUNTRIES
WITH + THAN 300
PARTNERS

ORGANIC
AGRICULTURE AND
AGROECOLOGY

CO2

LOW EMISSIONS
thanks to local waste recovery such as rice husk for inulation and heating

WETLANDS,
are very productive yet highly threatened areas

-35%* Throughout the world

-48%* In the Mediterranean Region

*Between 1970 and 2015 according to the latest report of the MWO (MWO2) and the Ramsar Global Wetland Outlook.

The Faïsses rice fields on the Tour du Valat Estate
© Jean Jalbert

THE ESTATE

The Tour du Valat Estate covers nearly 2,918 hectares in two different geographical areas in the Camargue: the Tour du Valat Estate, near the village of Le Sambuc, a commune of Arles, Bouches-du-Rhône, 2,817 ha, 1,845 ha of which is a regional nature reserve; the Petit Saint-Jean Estate (101 ha) in the part of the Camargue located in the Gard Department very close to Aigues-Mortes.

This estate feature a wide range of natural environments characteristic of the Camargue: large temporary marshes, sansouïres, salt meadows, and fossil dunes at the Tour du Valat, as well as a large grove of stone pines, thickets, and grasslands at the Petit Saint-Jean. Exceptionally rich natural heritage is found in these highly diverse environments: many rare and threatened species have their last refuges in the Camargue. In order to preserve and better understand them, numerous monitoring operations and inventories are regularly carried out. The Estate's team works to ensure optimal conditions for maintaining biodiversity. The research programs implemented on the Estate aim to better understand the functioning of environments and species in relation to the role of human activities.

ORGANIC FARMING, LIVESTOCK BREEDING, AND WINEMAKING AT PETIT-SAINT-JEAN: HIGH-QUALITY, DIVERSIFIED PRODUCTION

The Tour du Valat has its own extensive livestock farm in the central part of its site, with a herd of 250 cattle and 30 Camargue horses in 2023 (five foals born in 2023). On the Petit Saint-Jean Estate, the animals also help to maintain the vineyard in an eco-pasture system with some fifty Raïole ewes (a species with very low numbers, originally from the Cévennes).

Year after year, research work and the practical application of agroecology principles demonstrate the relevance of this model, in which viticulture, agroforestry, pastoralism, and diversified crops provide solutions to current challenges such as climate change and the erosion of biodiversity, while supplying high-quality, organic, local, and 100 % traceable products. At Petit Saint-Jean, a new milestone was reached in 2023 with the revamping of the winery and the first vinification of the entire harvest by our team. 254 hectoliters were vinified, from thirteen different grape varieties, including drought-resistant southern varieties from Sicily, Portugal, and even Georgia.

In addition to wine production, small crops of potatoes and sweet potatoes, aromatic and medicinal plants, and various types of soda (as part of the Verpiane project to recover soda for debittering olives) were grown on the Petit-Saint-Jean Estate. The pomegranate trees, planted in 2016, produced enough juice to be processed for the first time, and the large crop of myrtle berries was marketed to produce myrtle wine or to flavour ready-made meals.

THE TOUR DU VALAT ESTATE

On the Tour du Valat Estate the main activity of the farming season was the establishment of 20 ha of rice fields on the Faïsses agricultural plots. The crop yielded 93 tons of round rice of the Brio variety. In the autumn, the plots were drone-sown with clover and canola directly into the rice crop before harvest. This technique, which is being used increasingly in the Camargue, ensures that the plots are always covered, and there is no need to till the soil between two plantings. In addition, more than 150 different species have been planted using cuttings from the nursery set up in the Tour du Valat's former kitchen garden: white willow, black elder, ash, fig tree, and white mulberry have been added to the hedges in the cultivated plots and meadows.

To preserve biodiversity, 100 woodcrete sparrow nest boxes have been recovered and reinstalled near the buildings and in the hedges in the meadows, mainly for the Eurasian Tree Sparrow, a species that is in sharp decline.

Development of a station of flowering rush -Butomus umbellatus- around the Saint-Seren marsh
© Damien Cohez

REGIONAL NATURE RESERVE: DAILY WORK ENSURES BALANCED MANAGEMENT OF THE HABITATS

As part of a government-funded recovery plan, measures to preserve the dry grasslands on the Regional Nature Reserve have been actively implemented, significantly limiting the destructuring of the soil in these very fragile environments. Nearly 4 hectares of such grassland have been restored. The installation of fencing has made it possible to provide visitors safe access to the Saint-Seren observation platform, and to close off and preserve an additional 1.2 ha of reed beds in the Garcines marsh. The former cattle sorting paddock was completely dismantled in several phases. Almost 0.6 hectares were renatured, with 800 m of fencing, 4,000 m of barbed wire, and 2,000 posts removed in three collective “general interest projects” within the EcoTig project supported by the CEN PACA, and an in-house project.

One pair of Eurasian Tree Sparrow is present on the Estate despite sharp decline in Europe
© Thomas Galewski

THE BIODIVERSITY ON THE ESTATE

Despite the intense drought conditions (only 252.5 mm of rainfall for the entire year), the natural habitats on the Tour du Valat Estate fulfilled their role hosting significant biodiversity in 2023. Keeping the reed beds flooded in spring encouraged the reproduction of marsh birds. The Purple Heron made a comeback, with at least 6 nests counted.

SOME NICE SIGHTINGS!

A Baillon's Crake was again present on the site throughout June, making it possible to seriously consider a case of reproduction. The Iberian Grey Shrike is also making a comeback, with a highly probable breeding pair at Giraud North after an absence of 23 years!

2023 was also an exceptional year in terms of the sightings of rare species: the Eastern Bonelli's warbler and the Red-flanked Bluetail were observed for the first time ever at the Tour du Valat.

We should also mention the interesting development of Flowering Rush (Butomus umbellatus) in the Saint-Seren marsh. More than 160 plants of this pretty marsh flower were counted.

The first Red-flanked Bluetail ever sighted at the Tour du Valat!
© Thomas Blanchon

NATURAL HERITAGE ON THE PETIT SAINT-JEAN ESTATE

On the Petit Saint-Jean agroecological Estate, also owned by the Tour du Valat, the wildlife and flora inventories in 2023 were completed within two Life projects:

- Life Biodiv'Paysanne, operated by the Conservatoire des Sites d'Occitanie (Occitanie nature conservatory sites) in the Gard. Surveys were limited to the farming and wine-growing sectors (data currently being analysed);
- Life Agroforadapt, supported by Agroof, with listening points for breeding birds in agroforestry systems (lumber, meadow orchards, and hedges adjoining vineyards) (data currently being analysed).

The Gard Nature association devoted an entire day to identifying solitary bees on the site. The data collected will be added to the Gard natural heritage observatory base.

The inventory of microlepidoptera (smaller moths) started in 2012 by O. Pineau, former director of the estate, continued with 20 additional nocturnal sessions. 86 new species and 14 new genera (when the species could not be determined without studying the genitalia) were added to this inventory, bringing the total number of moths on the Petit Saint-Jean Estate to 351 taxa.

Cosmopterix pararufella is one of the exceptional moth species observed; the third such recording in France occurred on 12 June 2023. It should also be noted that half of all French observations of the *Ancylosis sareptalla* moth have been made at Petit Saint-Jean.

Finally, many *Tegostoma comparalis* were observed, and the colony on the Petit Saint-Jean Estate is its only regularly established one in France.

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ROSE RODIER

PhD Student

"The Camargue is a rich and complex system and I like to study the interactions between agriculture, other economic activities in the area, hydro-saline dynamics and the impacts on the environment and biodiversity."

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From left to right

THOMAS GALEWSKI, RANIA CHEIKH, MICHAËL RONSE, NINA BÈGUE, ANIS GUELMAMI, ELIE GAGET

The MWO 3.0 team

"The MWO 3.0: With the recent designation of Anis Guelmami as head of the MWO and the arrival of three new recruits: Nina, Michaël and Elie, the team is now much more solid! With the help of Thomas Galewski, a long-standing pillar of the MWO, and Rania (intern), the momentum is there!"

THE PROGRAM

FULL STEAM AHEAD IN 2023

With the end of restrictions linked to the health crisis and our new internal organisation in place, 2023 was the year of operation at cruising speed that the programme needed to consolidate its foundations while continuing to open up to new partners and fields of action.

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Marion Vittecoq gained the accreditation required to supervise research in health ecology in May, and two other Tour du Valat researchers should obtain their accreditation in 2024. Combined with 39 articles published (27 with an impact factor), these developments further strengthen the Tour du Valat's scientific legitimacy, credibility, and capacity. Above all, these accreditations will bolster our capacity to supervise doctoral theses, which is crucial for conducting scientific research. Three Ph.D. theses were defended in 2023 (Fabien Verniest, Florence Nono-Almeida, and Suzanne Catteau), and 11 are in progress at the Tour du Valat or in close collaboration with it, two of which began this year, and six of which should be defended in 2024. Three new post-docs have also joined the team. In addition, for the first time ever, two work-study students have joined the usual cohorts of interns and volunteers this year, which makes the Tour du Valat better placed than ever to meet the challenges of one of its core missions: to train young researchers and future managers in France and throughout the Mediterranean Basin, who will become the passionate and knowledgeable defenders of Mediterranean wetlands in future decades.

The 50 new funding agreements signed in 2023 bear witness to the vitality of the Tour du Valat's scientific and conservation programme. In addition to securing our financial future, these projects, whether they reinforce existing partnerships, such as the one with the French Development Agency, or mobilize new partners such as the Fondation du Crédit Mutuel, place us at the center of networks of key stakeholders in Mediterranean wetland research and protection. To assume its position as a regional leader and continue to address emerging issues for these wetlands, the programme team has been strengthened by several new recruits who fill strategic gaps in our expertise in coastal dynamics and geomorphology--a key concern for coastal wetlands in the context of climate change--, ecological restoration, statistics, nature-based solutions, and advocacy.

Awareness is increasing every day that wetlands are our best ally for tackling the major challenges of the 21st century. Political decision-makers, and increasingly those in the private sector, know that this fact can no longer be ignored, even if actions do not always live up to the words pronounced. With a renewed, experienced team, loyal partners, and many more hoping to join the Tour du Valat adventure every year, in 2024 we will continue to do everything in our power to halt the destruction of wetlands, and to ensure that the international target of restoring 30% of degraded wetlands by 2030 becomes a reality.

RAPHAËL BILLÉ
PROGRAM DIRECTOR

Common cranes, Camargue
© Thomas Blanchon

Species conservation

The Mediterranean Basin is a biodiversity hotspot. While some taxa show positive overall trends, wetland biodiversity, which includes many endemic populations in the Mediterranean Basin, is declining. Birds, reptiles, amphibians, and fish are threatened by direct and indirect factors, including climate change, habitat destruction, pollution, disturbance from recreational activities, legal and illegal harvesting, infrastructure, insufficient water management, and invasive alien species.

Today's main conservation challenges are to produce scientific knowledge on the effects of threats on the dynamics and distribution of these populations, assess the effects of management actions, and raise awareness of experts and policy makers through key messages. In this theme, we focus on bird, fish, and amphibian taxa for which we have developed expertise for many years. Our long-term population monitoring places us in various international networks of researchers and nature managers. These networks help to improve population estimates, identify negative trends, and sound the alarm to prevent the destruction of wetlands. In addition, our expertise is transferred to the Mediterranean community of stakeholders and managers through expert committees, online courses, training courses, workshops, and guides, reports, and other publications.

We have organised the theme into three complementary areas:

- the first focuses on populations with unfavourable status requiring judicious actions based on the latest scientific knowledge;
- the second deals with the direct and indirect negative effects of anthropogenic factors on wetlands, such as the increase of native or exotic predators, hunting or invasive alien species;
- the third deals with connectivity disruptions due to anthropogenic disturbances, since physical and chemical barriers are common and increasing in the Mediterranean.

JOCELYN CHAMPAGNON | COORDINATOR

THE PROJECTS

1 Reversing the decline of threatened populations

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Haytem Bouchri has started his PhD thesis on Marbled Teal in Morocco with support from the Tour du Valat's Mediterranean scholarship programme. To understand the movements of this nomadic species adapted to temporary wetlands, Haytem captured individuals and fitted them with GPS tags. He also coordinated the first large-scale census of breeding ducks in Morocco, focusing on the Marbled Teal and several other endangered duck species. This monitoring will be carried out over two more years, to obtain reliable estimates of the size of the Marbled Teal breeding population in Morocco. Finally, we helped organise an international workshop on the species within the framework of the LIFE Cerceta Pardilla project coordinated by several Spanish teams, in the aim of promoting conservation actions for this species in the Maghreb.

2 Providing management solutions that improve the status of vertebrate communities

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Among the various activities conducted, we presented to local stakeholders the results of monitoring the spatial and temporal distribution of wintering cranes in the Camargue, in relation to intercropping in agricultural plots (rice stubble, wheat seedlings, fallow land). The aim was to show the impact of crane incursions on wheat seedlings to a panel of local stakeholders, including farmers, to find collective solutions for preventing damage.

For example, delaying soil preparation after rice cultivation may help maintain the attractiveness of these habitats, where cranes feed on crop residues, which would divert them from feeding on the wheat.

Concerning certain species of gulls and terns, the avian flu epidemic on the French Mediterranean coast was catastrophic. Adult mortality was high and reproductive success almost non-existent for Sandwich Terns, Slender-billed Gulls, and Mediterranean Gulls.

3 Ensuring ecological connectivity for species migration and dispersal

DELPHINE NICOLAS | nicolas@tourduvalat.org

2023 was marked by a large-scale operation involving the capture and fitting of telemetry equipment (GPS and GLS) for over 300 birds from almost 40 different species, within the Migralion project. This project aims to understand how birds cross the Gulf of Lion (see Focus).

Study on the European pond terrapin in the journal Freswater Biology

A paper was published on how to conceive of protected areas in remote, data-poor regions, and another on the dispersal of the European Pond Turtle in the Camargue, exploring a combination of genetics and population dynamics. This study shows strong juvenile philopatry and male-based dispersal. In addition, as part of the COLAGANG project, some forty silver eels captured in two basins upstream from the Vaccarès lagoon in the Camargue were fitted with acoustic transmitters to follow their downstream migration path inside the Delta.

Marbled Teals, Northern Pintails, Ferruginous Ducks and Eurasian Coots in EL Hotba, Oualidia, Morroco
© Haytem Bouchri / Tour du Valat

Focus

SPECIES CONSERVATION

Studying bird migration in the Mediterranean to anticipate the effects of offshore wind turbines

The Paris Agreement adopted at COP 21 in 2015 aims to contain "the rise in global average temperature well below 2° C above pre-industrial levels (...) by continuing the action taken to limit the rise in temperature to 1.5° C". The IPCC has shown that this will require global carbon neutrality from 2050: this is the objective that the European Union and France have set themselves... As the energy sector is responsible for a significant proportion of greenhouse gas emissions, the European objective is to increase the share of renewable energies in energy consumption from 22 % in 2021 to 45 % in 2030. As far as offshore wind power is concerned, the EU estimates that it should cover 30 % of Member States' electricity demand by 2050, rising from its current capacity of 16 GW to 110 GW in 2030 and more than 300 GW in 2050. There are also around thirty offshore wind farm projects in the Mediterranean, particularly in Spain, Italy and Greece. In France, the government decided in March 2022 to build two 750 MW wind farms in the Mediterranean, each comprising 125 wind turbines almost 300 m high, half of them in the Occitanie region, off Port-la-Nouvelle, and the other half in the PACA region, off the Camargue.

However, the current development of renewable energies is leading to an ecological dilemma: although renewable energy production is essential for reducing greenhouse gas emissions and combating climate change, it can conflict with other environmental protection objectives. The impacts of offshore wind farms on ecosystems have been poorly documented up until now, with very incomplete knowledge. The potential impact of future power stations could be severe on migratory and seabirds, most of which are already in decline at European level as a result of the combined effects of intensive farming and the degradation of their habitats.

Floating wind turbines in the Mediterranean
© France Énergie Marine

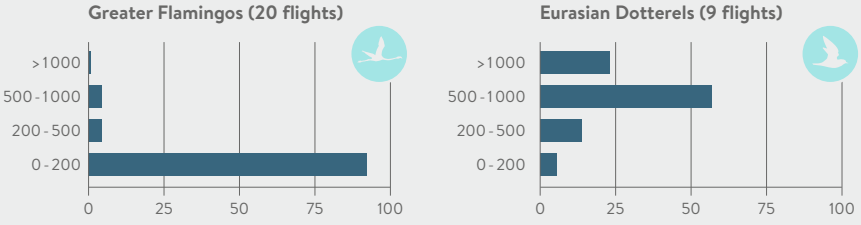

Figure 1.
Distribution of flight altitudes of 20 Greater Flamingos *Phoenicopterus roseus*, and 9 Eurasian Dotterels *Charadrius morinellus* over the Mediterranean Sea during their autumn migration.

THE MIGRALION PROJECT

Against this backdrop, a Migralion research programme, funded by the French Biodiversity Agency, began in 2021, and will deliver its conclusions in 2025. The aim of this programme is to gain a better understanding of the movements of the millions of birds that migrate across the Gulf of Lion and the Mediterranean, or that use this area to feed during their annual cycle. The "Seabird and terrestrial migratory bird telemetry" project aims to contribute to the acquisition of data to understand the spatial distribution of terrestrial migratory birds and seabird species at sea, as well as the possible existence of migration corridors and the altitudes at which migratory land and seabirds travel at sea. From 2021 to 2023, 861 individuals from 40 different bird species (Yellow Wagtail to the Greater Flamingo) were fitted with GPS tags adapted to their size.

FLIGHT ALTITUDES OVER THE SEA VARY ACCORDING TO SPECIES

This exceptional dataset is currently being analysed. The preliminary results already give us an idea of the altitude at which migratory birds cross the Mediterranean Sea and show that the crossing strategies are extremely variable according to the species. For example, the Greater Flamingo flies 90 % of the time below 200 m altitude (Figure 1A), while the Eurasian Dotterel spends most of its crossing time at higher altitudes (above 500 m, Figure 1B). The data analysed also confirms that most passerines migrate at night and at a very high altitude. Although they sometimes extend their migratory flights during the day when crossing a large ecological barrier such as the Mediterranean (and the Gulf of Lion), we observed that several individuals seemed to descend at the end of the night to continue their flight at sea level, thus increasing their vulnerability to new obstacles in their environment (Figure 2). We noted this behaviour in the Northern Wheatear, the Tawny Pipit, and the Yellow Wagtail, despite the small number of passerines monitored that crossed the Mediterranean.

The analysis and synthesis work will be consolidated in 2024 to describe these crossing strategies, which were previously unknown. We will focus on analysing the environmental conditions that influence migratory departures and the different crossing strategies observed in all species. The results will be published in 2025.

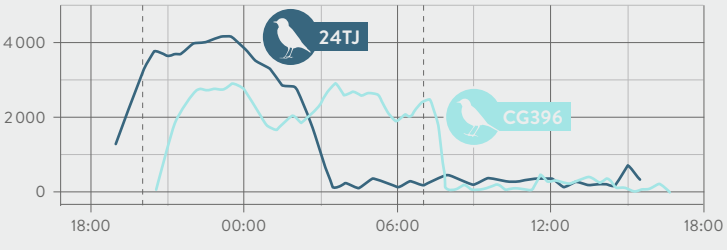

Figure 2.
Flights of a Northern Wheatear *Oenanthe oenanthe* (24TJ) and a Yellow Wagtail *Moticilla flava* (CG396) during their spring migration over the Mediterranean Sea.

© Stéphan Tillo

POSTDOCTORAL STUDENT Paul Dufour

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Yellow-legged Gulls on the Frioul Islands, Marseille
© Paul Moulin

Health ecology

Pollution is a major threat to Mediterranean wetlands with a direct impact on biodiversity and water quality. Infectious diseases are another direct threat to some vulnerable species. Their circulation in wildlife can also have an impact on human and domestic animal health. The overall objective of this theme is to contribute to limiting the impacts of pollution and infectious diseases, which are often linked, on wetland biodiversity. To achieve this goal, we are developing long-term studies that take account of the diversity of diseases and pollutants that affect biocenosis.

This theme focuses on two areas:

- understanding the impacts of pollutants on vertebrates;
- reducing the direct and indirect impacts of infectious diseases on wetlands.

Through this research we aim to encourage practices based on more environmentally friendly approaches to improve the resilience of ecosystems and to limit the occurrence of major health crises. This theme is part of the “One Health” concept, which emphasises the links between human, animal, and ecosystem health.

2023 was a year of successful field research and intensive laboratory studies in our two main ecotoxicology projects. Florence Nono-Almeida successfully defended her thesis on the exposure of Yellow-legged Gulls *Larus michahellis* to plastics, demonstrating the alarming extent of this exposure. Her research has led to the development of new methods for taking account of these microplastics in such studies. Mickaël Charriot analysed the pesticides present in the blood samples of five populations of European Pond Turtles *Emys orbicularis* in the Camargue during his Master 2 internship. His results confirm the high presence of the herbicide bentazone in these samples, and the role of hydrology in the contrasting exposure of individuals. Marion Vittecoq obtained the accreditation required to supervise research (HDR), and her defense session gave rise to a rich debate with leading researchers from the many disciplines involved in the One Health approach. We also stepped up our involvement in training activities on the links between health and biodiversity, by participating in a dozen training courses. Finally, we have joined the scientific advisory board of the prestigious Shape-Med@Lyon project, which aims to orient Lyon's medical research towards the One Health approach.

MARION VITTECOQ | COORDINATOR

THE PROJECTS

1 The European Pond Turtle: a sentinel species for the contamination status of wetlands

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The CISTOX project was continued with the sampling of turtles in the middle of the Fos-sur-Mer industrial zone as well as two populations in Brenne and six in Nouvelle-Aquitaine.
An article demonstrating the greater exposure to pesticides of turtles living near drainage canals compared to those living in the irrigation canals on the Tour du Valat Estate was submitted to Environmental Pollution. The results of Mickaël Charriot's Master 2 internship confirm the close link between pesticide contamination of the canals used by the turtles and their plasma contamination at the scale of the Delta. Finally, a new thesis project, led by Faustine Degottex and co-supervised by Anthony Olivier and Olivier Lourdais (Chizé CNRS), concerns the exposure of lizards and snakes to heavy metals and pesticides in the Camargue and the causes of the decline in some of the species studied.

2 Yellow-legged Gulls: witnesses and actors in the dispersal of plastic and antibiotic-resistant bacteria

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A new field campaign was successfully conducted in our five focal gull colonies. We ringed 75 adults and 577 chicks. We also installed 37 GPS devices. We published two articles: the first (Nono Almeida et al. 2023) shows that plastic ingestion is very common in Yellow-legged Gulls and tends to decrease in the parents when their eggs hatch. The second presents an analysis of movement data previously collected in the south of France (1999-2004), highlighting that the natal colony has a strong influence on gull movements (Souc et al. 2023).

3 Antibiotic resistance dynamics

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We published an article demonstrating the greater diversity of antibiotic-resistant bacteria carried by rodents in urban areas and sewage treatment plants than in nature reserves in the Camargue. We also contributed to the collective publication "L'antibiorésistance un fait social total" (Antibiotic resistance: a total social fact), published by Quae, with a chapter on the role of wildlife in antimicrobial resistance dynamics. Finally, we are co-leading a work group on antibiotic resistance with our partners at the CNRS, as part of the creation of the Camargue health-environment research workshop zone. The group's reflections are enabling us to continue developing projects aimed at gaining a better understanding of antimicrobial resistance dynamics in the Delta environment.

4 Trematode dynamics

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Molluscs hosting trematodes were collected monthly for 15 months on the Tour du Valat Estate, in collaboration with the University of Perpignan. Three contrasting sites were monitored: a permanent pond, a temporary pond, and a canal. No parasites were identified in the 1,355 molluscs collected. The environmental DNA also collected at these sites must now be analysed to determine whether parasites are nonetheless present, and to check whether all the different kinds of molluscs actually present were detected during our manual gathering.

Filtering water from a temporary pond in the Camargue for environmental DNA analysis
© Mathilde Jaquet

Focus

HEALTH ECOLOGY

Yellow-legged Gull movements and the impact on their health

Yellow-legged Gulls, which are emblematic inhabitants of the Mediterranean coast, have been remarkably successful in adapting to living close to humans. However, this coexistence poses major challenges, particularly in terms of health. These birds can carry pathogens such as antibiotic-resistant bacteria that are potentially dangerous to humans.

Charly Souc's thesis is part of the wider Ecodis project, which aims to understand how pollution, particularly in the form of plastics, in combination with parasites and pathogens, affects the health and population dynamics of the Yellow-legged Gull *Larus michahellis* in the Mediterranean coast. He also aims to assess how these issues affect the movements of these gulls and the risk of disease emerging in humans. Based on data collected during the monitoring of five colonies along the Mediterranean coast from Catalonia to Corsica, as well as the placing of GPS tags and rings on individuals in these colonies, his thesis aims to answer two main questions:

- What factors influence the movements of Yellow-legged Gulls?
- What effects do these movements have on the health of these populations?

Yellow-legged Gulls, chicks and adult, Frioul Islands, Marseille
© Paul Moulin

Based on the re-sightings of more than 5,000 ringed gulls, an initial study carried out as part of his thesis and published last year (Souc et al. 2023) revealed significant differences in the movements of gulls depending on their birth colony. For example, this species, which is partly migratory, shows a 45% variation in the proportion of young migratory individuals when comparing colonies located barely 50 km apart. These variations may be linked to environmental stressors, such as exposure to pollutants and the presence of disease. Charly is now continuing his thesis by investigating other aspects. In particular, he is exploring the influence of man-made food sources, such as landfill sites, on individual movements. He will then analyse the impact that a colony's poor reproductive success can have on the transmission of diseases within populations.

This research not only contributes to a fundamental understanding of the biology of this species, but also has practical applications for assessing environmental health and the risk of human exposure to pathogens and pollutants associated with these birds.

Two juveniles equipped in 2023 showing very different movement patterns between their fledging in June and December

Made by Charly Souc

Parasite detection in a Yellow-legged Gull

© Paul Moulin

DOCTORAL CANDIDATE Charly Souc, MIVEGEC - Tour du Valat

SUPERVISORS Karen McCoy (MIVEGEC), Rémi Choquet (CEFE) and Marion Vittecoq (Tour du Valat)

TEAM Carole Leray (Tour du Valat), Thomas Blanchon (Tour du Valat) and Thomas Dagonet (Tour du Valat)

PARTNERS **Technical :** Claude Estournel (LEGOS), Wolfgang Ludwig (CEFREM)

Financial : CNRS MITI "Health Ecology" programme, support from OFB and ANR EcoDIS (ANR-20-CE34-0002)

Solila Reserve, Montenegro,
pilot site for the RESCOM project
© RESCOM / Tour du Valat

Management and restoration of natural and agricultural ecosystems

In order to conserve the rich biodiversity associated with wetlands, we work at different scales in different geographical zones. It has been shown that it is more efficient and effective to conserve existing wetlands as it is often difficult or impossible to restore destroyed wetlands to their pre-existing conditions. However, when damage or destruction have already occurred, restoration can be proposed as an option to improve the wetland functions and their biodiversity.

We use both approaches to ensure the sustainability of wetlands today and in the future. Our management activities aimed at conserving existing wetlands are constantly evolving to meet the changing contexts. Global changes, including climate change and social-economic activities, are taken into account in all of our management and restoration activities to meet the new threats and to find adequate alternatives. By looking outside of the strictly protected areas, we are able to study and improve the existing activities in order to find solutions that take into account both the human and natural aspects of the wetlands.

The Tour du Valat Estates including the Tour du Valat, the Petit Saint-Jean, and the Verdier marshes are real open air laboratories where we test different management and restauration techniques. This year we have been able to actively restore some key habitats on our land including reed beds and temporary marshes. We have also worked with local private and public landowners to continue our management and restoration activities in over 3,000 ha of wetlands in the Camargue.

LISA ERNOUL | COORDINATOR

THE PROJECTS

1 Wetland management and restoration

LISA ERNOUL | ernoul@tourduvalat.org

We continued evaluating the hydraulic management calendars for hunting marshes that might be most compatible with Mediterranean biodiversity (MediCyn) and we improved the functioning and hydrological management of two Camargue sites (Petit Badon and Cassaïre) to increase the impact of our restoration activities. We also continued to evaluate the temporary ponds created in the Camargue and our long-term monitoring of three natural ponds in the Tour du Valat Reserve.
Additional work was carried out on assessing the conservation status of agro-pastoral habitats, and we published our results on identifying functional traits as indicators of conservation status. A thesis on the conservation of *Lestes macrostigma*, a priority species under the National Action Plan for Threatened Damselflies and Dragonflies, was finished. The results provide knowledge that will guide the management and restoration of temporary brackish habitats.

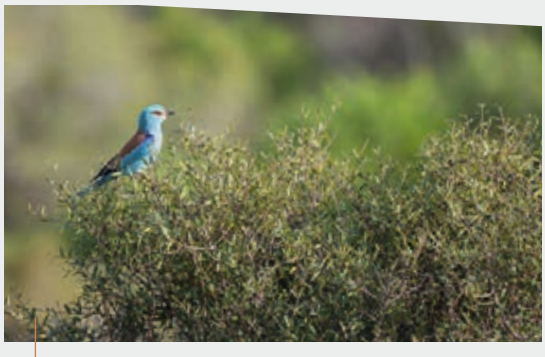
The Tour du Valat continued its work on the Etangs et marais des salins de Camargue site. An inventory of how this site is being colonised by invasive exotic plant species was undertaken this year. It will be used to define appropriate management strategies.
We intensified our work around the Mediterranean Basin with two new projects: Feu Vert (funded by the Prince Albert II of Monaco Foundation) and RESCOM (funded by the FFEM and the Mava Foundation) and implemented by the Mediterranean Biodiversity Consortium. The Feu Vert (Green Light) project has enabled us to initiate a new riparian restoration project in Akyaka, Turkey, in collaboration with the Mediterranean Conservation Society (AKD). The RESCOM project implements Nature-based Solutions to strengthen the social and environmental resilience of natural areas in the Mediterranean.

This project combines regional activities and very concrete actions at six pilot sites in Albania, Morocco, Montenegro, Tunisia, Turkey, and Italy.

2 Studying and promoting agroecology

ARNAUD BECHET | bechet@tourduvalat.org

Agro-ecology activities were developed on the Tour du Valat and Petit Saint-Jean Estates, and across the Camargue with a network of local farmers. We were able to harvest 20 ha of organic rice at the Tour du Valat, and we experimented with sowing rapeseed and clover as cover crops before harvest, with a view to replenishing organic matter and preserving soil life over the winter.



European Roller
© Thomas Blanchon

At Petit Saint-Jean, we stopped using pheromone traps to catch grape berry moths and are now relying solely on chiropterans to control these pests. We continued to monitor biodiversity on arable plots in the Camargue and completed the inventory of chiropterans in 80 plots with different landscapes. An initial survey of the 56 nesting boxes installed in the Camargue on organic farms showed a satisfactory first-year occupancy rate of 43% by a variety of bird species (Common Hoopoe, European Roller, Western Barn Owl).

The lagoons and marshes on the former saltworks of camargue after renaturalisation
© Marc Thibault / Tour du Valat

Focus

ECOSYSTEM MANAGEMENT

Recreating wetlands: a look back at over a century of creating temporary ponds in the Camargue

RESTORING DEGRADED ECOSYSTEMS

The erosion of biodiversity, and in particular wetland biodiversity, is so considerable that it is now necessary to restore degraded or destroyed ecosystems if we hope to reverse this trend. But what exactly does restoration mean? Restoration means returning an ecosystem to the state it was in before it was degraded or destroyed by humans. This state is considered as a reference state that must be reached for restoration to be successful. The notion of reference state is highly controversial: what era are we talking about, given that humans and nature have a shared history stretching back thousands of years in Europe? Why and upon what criteria should we define an ideal state when ecosystems are variable and dynamic by nature? We have chosen not to use a fixed, theoretical reference state for our ecosystem, but a whole range of sites where the current ecosystem is considered to be well preserved and representative of the historical ecosystem.

CONSERVATION STATUS

Our study focuses on temporary Mediterranean ponds in the Camargue. These are some of the most remarkable ecosystems in the Delta, not only because of the incredible diversity found there, but also because of their specific features linked to the Mediterranean climate.

CNRS pond at the Tour du Valat, covered with flowering Pond Water-Crowfoot *Ranunculus peltatus*
© Hugo Fontes

Here, the hot season corresponds to the dry season, which means a significant water deficit in the summer. Aquatic environments fed solely by rainfall dry up naturally in summer, and some species are specifically adapted to these conditions. Temporary Mediterranean ponds, in the Camargue as elsewhere, have suffered a great deal of damage: destruction, physical deterioration or damage caused by artificial flooding and other operations. Over the last ten years, several projects have aimed to recreate these ecosystems in the Delta. Many temporary ponds have also been created involuntarily since the 19th century. These are depressions that were dug to recover soil when dykes were built, such as at La Palissade where several temporary ponds were created during the construction of the "Napoleon dyke." We have attempted to assess these voluntary or accidental operations by comparing the vegetation of a set of "natural" reference ponds with these artificial ponds.

Threebract Loosestrife *Lythrum tribracteatum*
© Hugo Fontes

The vegetation of ponds created in the 19th and 20th centuries (15 ponds studied) is similar to that of certain natural ponds (27 ponds studied). The vegetation of ponds created more recently (12 ponds studied) differs from that of natural ponds, but nevertheless contains some species that are typical of them. This is particularly true of aquatic plants. For example, several aquatic species such as *Zannichellia obtusifolia* or the Short Leaved Water Starwort *Callitriche truncate* can be found in certain ponds created less than a decade ago. Conversely, species that develop during the terrestrial phase (when the pond gradually dries out in spring) have not significantly colonised artificial ponds. This is particularly true of the very rare Many-Seeded Water Plantain *Damasonium polyspermum* and the Threebract Loosestrife *Lythrum tribracteatum.*

RESULTS

The restoration and creation of new ponds, to compensate for their historical destruction and degradation, has produced encouraging results, since the ponds created several decades ago are now home to vegetation similar to the best-preserved natural environments of today. However, these results remain unsatisfactory, since a certain number of species, including some of the most remarkable ones, are not found or are very rarely found in these artificial environments, even old ones. The conservation of wetlands is therefore an absolute priority and cannot generally be compensated for by the restoration or creation of equivalent environments. Nevertheless, to halt or even reverse the erosion of biodiversity, natural area protection can be complemented by the restoration of other areas.

Many-Seeded Water Plantain
Damasonium polyspermum
© Hugo Fontes

HEAD Hugo Fontes

TEAM François Mesleard, Patrick Grillas, Thierry Dutoit and Antoine Gazaix

PARTNERS **Scientific and technical :** Camargue Regional Natural Park, French Coastal Protection Agency, Camargue National Nature Reserve, National Nature Protection Society, Vigueirat Marshes National Nature Reserve, Tour du Valat Regional Nature Reserve

Financial : Rhone Mediterranean Corsica Water Agency

RETROSPECTIVE 2023

© Giorgi Giorgadze

GIRL POWER | 8 MARCH 2023

Women partners in the "Civil Society and Wetlands" project celebrate International Women's Day in Samsum, Turkey.

© Tour du Valat

WHERE IS THE ROSETTE AGENT?
10 MARCH 2023

Sampling to detect *Pseudorasbora* and its parasitic host, the Rosette agent, via environmental DNA. Thanks for your help IRD!

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IRAQ MARSHES | 6 APRIL 2023

Omar al-Sheikhly, Iraqi scientist and environmental activist, Technical Director of the main Iraqi environmental NGO, the Iraqi Green Climate Organization (IGCO), was welcomed at the Tour du Valat to discuss the fate of Iraq's marshlands.

© Tour du Valat

THANKS MAVA! | 27 APRIL 2023

Celebrating 28 years of Mediterranean partnerships initiated, led, and funded by the MAVA Foundation! A chance to visit our Petit Saint-Jean agro-ecological farm.

© Tour du Valat

ACTING FOR AND WITH LIVING ORGANISMS! | 31 MAY 2023

A 15-year forward-looking seminar in the magnificent Montpellier countryside, to help us design a desirable future that is good for wetlands and can increase the impact of our actions. Even indoors, living organisms are not far away!

© Marion Douchin

LAUNCH OF THE RESCOM PROJECT
11 & 12 JULY 2023

This Mediterranean Biodiversity Consortium project, launched in July 2023 in the Camargue, aims to strengthen the social and environmental resilience of vulnerable natural areas in the Mediterranean by developing various Nature-based Solutions.

© Tour du Valat

CARBON CAPTURE | 11 OCTOBER 2023

Jean Jalbert speaks at the preview of the splendid documentary “Blue Carbon” hosted by the LUMA Foundation in Arles. The term “Blue Carbon” refers to the carbon contained in coastal ecosystems; habitats that have long been destroyed but are now proving to be extraordinary carbon sinks.

© Tour du Valat

CHEERS! | 30 NOVEMBER 2023

A festive occasion to celebrate Roberta Fausti’s retirement: she was the Tour du Valat’s librarian-documentalist.

© Tour du Valat

“ADOPT A FLAMINGO”
11 NOVEMBER 2023

Once again this year, sponsors were on hand to find out all about their favourite bird!

Installation of instruments to measure marine currents to the south of the «Etangs et Marais des Salins de Camargue» as part of the European Rest-Coast project
© Loïc Willm

Wetland dynamics and water management

Climate change is exacerbating already existing environmental problems in the Mediterranean Basin, due to unevenly distributed water resources, increasing pollution, and changes in land use such as the conversion of natural wetlands into urban and agricultural areas or artificial wetlands.

Land use and water management choices and policies are complex processes resulting from numerous socio-economic factors. They involve stakeholders with sometimes conflicting interests. In addition, the socio-economic and political context tends to generate short-term responses that do not adequately address long-term environmental problems.

In this context, our team is working to:

1. inform decision-makers, stakeholders, and managers and raise their awareness of the changes affecting Mediterranean wetland habitats (losses, conversions, hydrological alterations);
2. help them to substantiate their water management choices:
   - with the best possible compromise between all the issues and uses of these areas in terms of biodiversity, human activities, and other concerns;
   - by looking not only at resolving short-term problems, but also addressing long-term ones.

OLIVIER BOUTRON | COORDINATOR

THE PROJECTS

1 Understanding the spatial and temporal dynamics of wetlands

ANIS GUELMAMI | guelmami@tourduvalat.org

In 2023, we focused on launching three major new projects. First, the Horizon Europe RESTORE4Cs project (2023-2026), which aims to improve knowledge on the role of coastal wetland restoration in mitigating the effects of climate change, particularly through the sequestration of greenhouse gases (GHGs). This project also studies the co-benefits other than GHG sequestration, including maintaining biodiversity and regulating the water cycle, in order to better reconcile the fight against climate change with the other services provided by these ecosystems.

OurMED (2023-2026) is the other ambitious project launched in 2023. Funded by the PRIMA research programme, it aims to promote the key role played by Mediterranean wetland ecosystems to offset the water crisis facing the region. The aim is to help the various stakeholders find innovative solutions to improve the management and governance of water resources and increase the storage capacity of catchment areas, while guaranteeing supplies for all socio-economic sectors and natural ecosystems. Seven Mediterranean catchment areas spread across contrasting bioclimatic contexts have been selected as demonstration sites. The Mediterranean Basin has also been identified as a demonstration site in its own right, and the results obtained there will be analysed by the Mediterranean Wetlands Observatory (MWO).

Finally, we launched the Earth Observation for Wetlands Inventory (EO4WI) project. Funded by the European Space Agency (ESA), it aims to develop national mapping inventories in four pilot countries, including Algeria and Italy. In addition to the results that will be produced for these countries, this will also be an opportunity to integrate them into the future Mediterranean wetlands geoportal that is currently being created by the MWO.

2 Informing water management

OLIVIER BOUTRON | boutron@tourduvalat.org

For the European REST-COAST project (www.rest-coast.eu), field monitoring and modelling were continued to estimate the consequences of abandoning the defence infrastructure to the south of the Etangs et Marais des Salins de Camargue (EMSC) on the geomorphological evolution of the site, its hydro-salinity functioning, the dynamics of terrestrial and aquatic vegetation, and greenhouse gas emissions (in collaboration with INRAE).

As regards the «Maximum acceptable flows of nutrients in lagoon systems» project, we are now working with local stakeholders in four lagoons. Water Framework Directive (WFD) field campaigns to monitor nine lagoons have also been carried out. For Rose Rodier's thesis (co-supervised by INRAE), a conceptualisation of the socio-ecological system of the Ile de Camargue was carried out, based on three object-oriented interaction diagrams for the governance of water resources, agriculture, and interactions between local activities and biodiversity.

Clément Fabre has started his post-doctorate (working with the Functional Ecology and Environment laboratory) on modelling water, sediment, salt, and organic carbon flows in the Rhone catchment area.

The Restore4CS team during sampling at the Camargue pilot site
© LifeWatch ERIC / Università del Salento

Focus

WATER AND WETLANDS

How Earth Observation tools help us prioritise the wetlands to restore

To better characterise the health status of Mediterranean wetlands and the changes they are undergoing over large spatial and temporal scales, it is essential to have high-quality cartographic data on these environments: their location, their boundaries, the types of habitats found in them, the main ecosystem services they provide, and the threats they face... These data can then be used to target the most appropriate conservation and restoration measures to implement.

The Ramsar Convention has always considered cartographic data, such as national wetland inventories, as key information on which to base national policies aimed at the wise use of these ecosystems. Furthermore, the development and implementation of wetland-related strategies clearly require basic knowledge of these ecosystems. The lack of reliable data and information on a country's wetlands is often a major handicap that impedes the implementation of effective conservation, management, and restoration measures.

Earth Observation data make it possible to meet these monitoring needs in an accurate, exhaustive, harmonised, and low-cost manner. For over 20 years, the Tour du Valat has been developing genuine expertise in this area, which it now shares with its various partners in all the Mediterranean countries, notably through the organisation of training and capacity-building workshops.

Oued Sebou, Morocco
© Mailis Renaudin

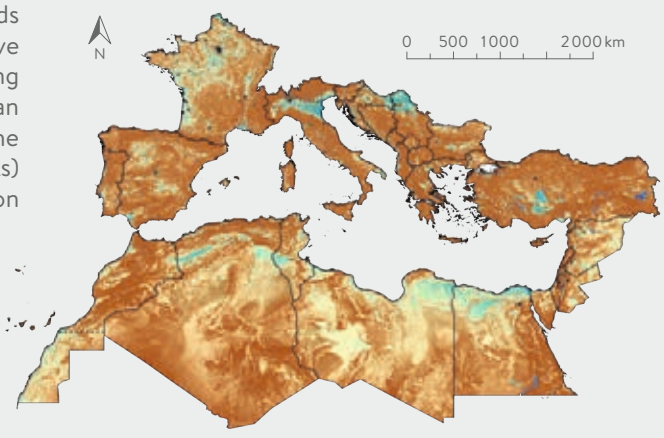
METHOD

In this context, the Mediterranean Wetlands Observatory (MWO) has devised an innovative mapping approach aimed at better targeting the areas where lost wetland habitats can be recreated and restored. It is based on the mapping of Potential Wetland Areas (PWAs) and Potentially Restorable Wetlands (PRWs) on a large scale, using hydro-ecological and topographical data, combined with climatic variables, surface water dynamics, and land use and occupation. The result is a pan-Mediterranean map showing the number of wetland habitats, according to the criteria listed above (Figure 1).

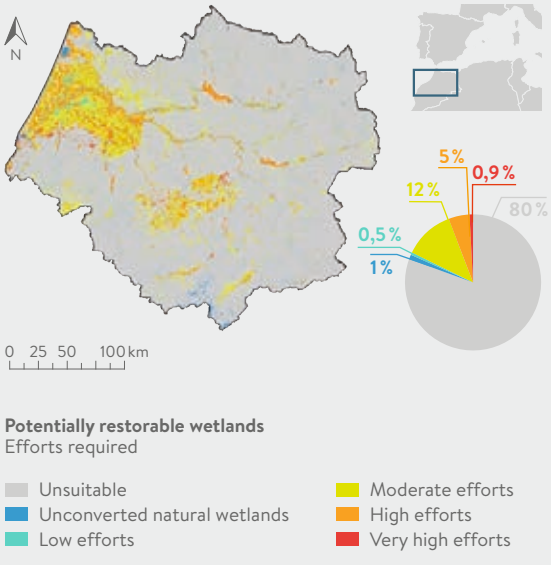
A PWA map can therefore help to locate and delimit former wetlands that have been transformed by humans, either through direct drainage or indirect drying, or following their conversion to other types of use, such as agriculture. This map of PWAs could be used to help prioritise areas for future restoration work. Cross-referenced with other spatial data, such as data on land use and land cover, the PRW maps generated in this way would make it possible to estimate, in qualitative terms, the efforts required to restore lost wetland habitats.

An initial analysis of these ZHPRs has been carried out for the Sebou catchment in Morocco, the results of which are illustrated in Figure 2. They reveal that the Sebou catchment contains a total restorable area of wetland habitats of over 7,000 km², more than half of which can be restored with low to moderate relative effort.

This provides a crucial knowledge base that can help stakeholders in these areas to incorporate quantified objectives, in terms of the potential for recreating lost wetland habitats, when developing land-use or water resource management plans. In addition to spatially identifying wetlands that could be restored, this data could also be used to guide thinking about the type of restoration action to be implemented, depending on the desired benefits in terms of ecosystem services (groundwater recharge, flood protection, atmospheric carbon sequestration, maintenance of biodiversity).



Ultimately, these new data, along with all the results produced by the MWO, will be made freely available via the future Mediterranean Wetlands Geoportal, which will be developed and managed by the MWO.



HEAD Anis Guelmami (guelmami@tourduvalat.org)

TEAM Anis Guelmami, Nina Bègue et Michaël Ronse

PARTNERS **Scientific :** Universities of Aveiro, Valencia and Malaga, Remote Sensing Solutions
Financial : Horizon Europe (RESTORE4Cs project)

Pilot site for the Mediterranean Wetlands Alliance's «Green Light» project in Gökce, Turkey
© Eran Hakim

Science and society interfaces

Everywhere in the Mediterranean, people are speaking up against the decline of wetlands. The Tour du Valat supports them by coordinating several networks involved in the conservation of wetlands and their biodiversity.

The anthropogenic pressures that are directly degrading Mediterranean wetlands, such as land artificialisation, intensive agriculture, pollution, the overexploitation of water resources, and illegal hunting often stem from poor governance or an uninformed decision-making process. Decision-makers who are ill-informed and/or unconvinced of the importance of these ecosystems will not take the measures needed to guarantee their preservation. Within our theme, we have grouped together several science-society interfaces whose mission is to inform and raise awareness among decision-makers and civil society of the importance of conserving wetlands, and also to give managers and civil society organisations the tools they need to better manage and defend them.

THOMAS GALEWSKI | COORDINATOR

THE PROJECTS

1 Mediterranean Wetlands Observatory (MWO)

ANIS GUELMAMI | guelmami@tourduvalat.org

The MWO develops and disseminates knowledge on the status and trends of wetlands in Mediterranean countries, with the aim of encouraging action to preserve and restore them. In 2023, in addition to strengthening the team with the arrival of new recruits, our main focus was on redefining the MWO's monitoring indicators and action strategies, with the third regional report on the horizon. A "country-based" approach will henceforth be favoured for the monitoring tools developed by the MWO. This is already the case for the Mediterranean wetlands geoportal, which started to be built in 2023, and should be operational by the end of 2024.

THE PROJECTS (NEXT)

2 Status-Pressures-Responses of wetland biodiversity

THOMAS GALEWSKI | galewski@tourduvalat.org

This research axis studies the responses of Mediterranean wetland biodiversity to global changes on a macro-ecological scale. Much of this axis is dedicated to research on strategies for adapting to climate change that can conserve species. In 2023, we highlighted the sites that should be protected to help waterbird communities adapt to global warming, which are located mainly in the eastern and southern parts of the Mediterranean Basin. We also produced a new version of the Living Region Index for the French Provence-Alpes-Côte d'Azur region. Once again it confirms the key role of conservation actions in reversing species decline.

3 National Biodiversity Observatory (NBO)

CHRISTIAN PERENNOU |
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As part of the NBO, led by the French Biodiversity Agency, the Tour du Valat continued to lead a "Wetlands" thematic group, and to develop new indicators to better monitor the status of wetlands, the pressures they are facing, and other key issues. One of these indicators, on the contribution of European LIFE projects to the conservation of wetlands in France, has been finalised and is now available online.

4 Mediterranean Waterbird Network (MWN)

LAURA DAMI | dami@tourduvalat.org

In 2023, the MWN continued its support aimed at improving the quality and quantity of census data in North Africa, through international training (around twenty participants from the five northern countries), financial support for TOTAL COUNTS by increasing the number of sites monitored and the distribution of optical equipment. New monitoring of illegal hunting activities in eight Mediterranean countries has also been launched.

New international joint projects have been initiated that will make it possible to estimate bird population trends across different flyways.

5 Mediterranean Wetlands Alliance (MWA)

LORENA SEGURA | **CHRISTIAN PERENNOU**
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The MWA federates civil society to increase the visibility of wetlands in the Mediterranean area, particularly in national and regional policies. It brings together 32 NGOs and research centres from 17 countries. In 2023, its activities included the "Red Alert" on the Narta Lagoon in Albania (mobilisation of 33 organisations from 26 countries, to which the European Union and the Albanian government responded), and the first test of the new "Green Light" scheme, which aims to facilitate the launch of ecological restoration activities in a pilot wetland in Turkey. A major new project has been submitted to the Agence Française de Développement to enable 15 members in the southern and eastern Mediterranean to carry out new, larger-scale conservation micro-projects.

6 Mediterranean Lagoons Transfer Unit consortium

VIRGINIE MAUCLERT |
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As the leader of one of the five Wetlands Transfer Units, the Tour du Valat has continued to support those involved in the conservation of lagoons and their peripheral wetlands in the French Mediterranean, in partnership with the Occitanie Nature Area Conservancy and the Corsican Environmental Agency. In order to assess the conservation status indicators for the priority natural habitat of community interest 1150 "Coastal lagoons", which covers over 85,000 ha on 39 Natura 2000 sites, facilitators and managers took part in training courses and joint studies conducted within the framework of the Life Marha programme coordinated by the OFB.

Focus

SCIENCE AND SOCIETY INTERFACES

Invasion of French Mediterranean lagoons by the Atlantic Blue Crab

Invasive on the coasts of the Mediterranean Basin, the Atlantic Blue Crab *Callinectes sapidus* is very tasty and marketed for its gustatory qualities. Originally from the temperate and tropical coasts of the western Atlantic Ocean and Gulf of Mexico, it was introduced into the Mediterranean at the beginning of the 20th century, probably via ballast water and / or for aquaculture activities. It has gradually invaded the Mediterranean Basin, from the Black Sea and the European countries of the eastern Mediterranean to the Ebro Delta in Spain, around 2010.

In France, the Blue Crab was first spotted in the Berre Lagoon in 1962 and in Corsica in the 1990s, and it has gradually spread along the French coastline, becoming invasive in some lagoons between 2021 and 2023. In the Canet Saint-Nazaire Lagoon in the Pyrénées-Orientales department, close to Spain, as well as in the Biguglia and Palo lagoons in Corsica, it is even considered to be a real scourge for "small-scale" fishing. Voracious, aggressive, and prolific, it is currently held responsible for a decline in benthic shellfish stocks in Spain and in Italy in the Po delta and the Venice lagoon. In 2021, it took just one season for this species to become the sole catch in fishing gear targeting eels in the Canet Lagoon (14 tonnes in 2022).

Faced with this situation, the French government, the French Biodiversity Agency (OFB) and the Corsican Environmental Agency (OEC), which are responsible for public policies to combat invasive alien species, have decided to work together with stakeholders in the Occitanie, Sud-Paca, and Corsica regions to implement actions aimed at the early detection, monitoring, and management of the Blue Crab.

Fisherman in the Biguglia pond in Corsica
© Stéphan Le Gallais

The Atlantic Blue Crab, *Callinectes sapidus*
© Stéphan Le Gallais

As a result, since 2022, the Ministry of Ecology and the OFB have commissioned the Mediterranean Lagoons Transfer Unit consortium, run by the Tour du Valat, with the Occitanie Nature Area Conservancy (CEN Occitanie) and the Corsican Environmental Agency to set up a coordination mission for the entire coastline in conjunction. The team has been mobilised to strengthen the links between those who report and share knowledge, including fishers, regional fisheries committees, managers of marine areas and protected natural areas, and leaders of citizen watch networks.

The Mediterranean Lagoons Transfer Unit consortium organises an annual inter-regional conference on knowledge and management actions and produces a specific bulletin on the Blue Crab in partnership with the CPIE Bassin de Thau (Environmental Initiative Centre). Tools for reporting catch and observation data for the Blue Crab are now available in the 3 French Mediterranean regions (smartphone application, online map). Research projects (e.g., acoustic telemetry in Corsica, experimentations on haline tolerance, early detection of the Blue Crab using DNA at 25 lagoon sites and sites close to the mainland coast), monitoring (e.g., biometric, isotopic), and capture (e.g., netting) are being carried out in the Mediterranean region. Researchers and managers are working with fishers in the most heavily affected lagoons (Canet, Biguglia, and Palu) to gain a better understanding of their ecological impact and to understand their movements so that they can be caught more effectively. To better control the species, fishing equipment was purchased by the OEC in 2023 so that professional fishers in the lagoons that have been heavily impacted can strengthen their fishing gear and try to maintain their fishing activities.

The originality and strength of this coordination action lies in the co-construction of joint decision-making, through consultation between stakeholders who have very different but complementary activities, such as environmental protection and professional and commercial fishing. It is hoped that the invasion will be curbed as fishers exert pressure on this species in lagoon habitats and remove it from the environment. However, it is equally feared that the commercial interest generated by the added value of the large specimens caught will change the situation and that fishing pressure exerted at times that are not conducive to controlling the blue crab population will have no effect on the targeted species. This pressure could have an impact on biodiversity, which has already been weakened by the presence of Blue Crabs, particularly eels, which are categorised as critically endangered.

The value chain that is being organised must therefore strike a balance between promoting the product as locally as possible and raising awareness about invasive species. The release of a Blue Crab caught into the water is prohibited, in compliance with the level 1 status of this invasive alien species since March 2023. It is very difficult to predict the future of this invasion, and the aim is to identify the best ways of targeting and removing the species massively through coordinated, adaptive action by all those involved.

To go further : https://pole-lagunes.org/en-action/coord-crabe-bleu/

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PARTNERS **Technical :** CEN Occitanie, Corsica Environmental Agency, Occitanie, PACA and Corsica DREAL (Regional Directorate for Environment, Planning and Housing), Corsica delegation for the sea and coast (DMLC), regional CRPMEMs, all lagoon and coastal environment management organisations, Coastal protection agency, CPIE Bassin de Thau, Banyuls-sur-Mer Oceanological Observatory, University of Perpignan Via Domitia, EPHE CEFE-CNRS, Cépralmar, MNHN, Ifremer, University of Corse, University of Palermo
Financial : OFB, Ministry of Ecology, Corsica Environmental Agency

© Hervé Hôte / Agence Caméléon

MARIO ALBERT

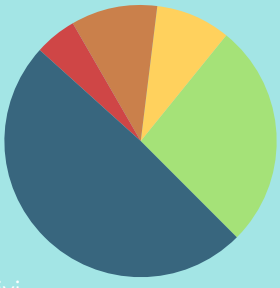
Head of masonry

"After more than 24 years as a masonry contractor,
I'm now happy to pass on my knowledge within the foundation."

OUR ACHIEVEMENTS

Knowledge transfer is central to the Tour du Valat's mission, and a great amount of effort is made to achieve that goal. Communication in the scientific world, through publications and talks, and making the results of our research available to potential users (site managers in particular), are major activities for our teams.

PUBLICATIONS 2023



We published a wide range of articles in international journals, with 39 publications by the end of 2023, 27 of which had an impact factor, for an average impact factor of 3,78. Our activities are not limited to our scientific publications, and our publications are diversified both in terms of nature of the documents (see figure above) and target audience (scientists, site managers, technicians, students, the general public, and others).

SCIENTIFIC PUBLICATIONS	39
PHD / HDR *	4
BOOKS / CHAPTERS IN BOOK	8
STUDENTS REPORTS	7
TECHNICAL DOCUMENTS	21

*HDR : Habilitation to direct research

Find all our publications by scaning this QR code!

RESOURCE CENTRE FRANÇOIS BOURLIÈRE LIBRARY

The Tour du Valat Resource Centre has been in existence since 1954. It was initially made up of documents from the personal library of the Tour du Valat's founder Luc Hoffmann:

- 6,490 publications and theses;
- 490 different periodicals of which 71 are running;
- 46,450 offprints, booklets and reports.

Thanks to our library portal, tourduvalat.centredoc.fr, the centre enables any internet user to:

- discover the most recent publications by Tour du Valat researchers
- carry out bibliographical research in the document collection;
- open an online reader account to benefit from a range of custom services: saving research results on-line, and the possibility to create alerts or to generate an RSS flow...

INFORMATIONS

The Resource Centre is open to everyone on Mondays, Tuesdays and Thursdays from 9.00 to 12.00 and from 1.00 to 5.30. It offers Wi-Fi-connected workstations, access to all documents, and the assistance of a librarian.

Ph. +33 (0)4 90 97 29 76 / biblio@tourduvalat.org
Documental portal: tourduvalat.centredoc.fr

CONVEYING & CONVINCING

In addition to our many scientific and technical publications, every year we carry out numerous skills transfer and advocacy activities, which are vital to achieving our mission of "Ensuring the conservation and wise use of Mediterranean wetlands by improving our understanding of how they function and mobilising a community of stakeholders." Here are just a few examples of our work.

Kizilirmak Delta, Turkey
© Tour du Valat

"CIVIL SOCIETY AND MEDITERRANEAN WETLANDS» PROJECT

In March 2023, the 12 international partners in the project, funded by the Agence française de Développement, the French Facility for Global Environment, the French Biodiversity Agency, and the MAVA Foundation, met in Samsun, Turkey. It was an opportunity to assess the activities completed during the past four years, aimed at strengthening the resources and capacities of civil society in the countries in the southern and eastern Mediterranean Basin, so that they can defend these endangered environments more effectively. It also gave us the opportunity to plan the work of the second phase of the project, to run the annual workshop of the Mediterranean Waterbird Network, and to offer a training course for emerging NGOs.

EVALUATION OF THE CONSERVATION STATUS OF LESTES MACROSTIGMA POPULATIONS IN BULGARIA

Over the last decade, we have improved our knowledge of the ecological requirements of the magnificent damselfly *Lestes macrostigma*, and of the best practices for maintaining its populations and restoring temporary brackish ponds, its typical habitat. This work has enabled us to include the species in the LIFE programme "Conservation of the coastal lagoon of Lake Pomorie" in Bulgaria, where the species is "critically endangered." From 2021 to 2023, local staff from the NGOs Green Balkans and Bulgarian Biodiversity Foundation were trained in damselfly and dragonfly monitoring. *Lestes macrostigma* populations were studied along the Bulgarian Black Sea coast, making it possible to assess the species' conservation status on a national scale and to propose recommendations for improving this status.

"MEDITERRANEAN COASTAL WETLANDS IN THE FACE OF CLIMATE CHANGE: WHAT KNOWLEDGE AND CONSERVATION ACTIONS ARE NEEDED FOR ADAPTIVE MANAGEMENT?"

This was the theme of the meeting organised by the Mediterranean Lagoons Transfer Unit consortium that brought together nature managers and scientists in November 2023. 140 people from 56 organisations in the three Mediterranean regions discussed the need to adapt and the opportunities to be seized to work together to invent a dynamic, evolving form of development that places these wetlands at the heart of regional projects.

Meeting for nature managers and scientists organised by the Mediterranean Lagoons Transfer Unit consortium at the Tour du Valat in November 2023
© Tour du Valat

COMMUNICATION ABOUT THE PROJECT TO RECREATE A TEMPORARY MARSH ON FORMER FARMLAND ON THE PETIT BADON PILOT SITE

This project was started in 2019 on private property in the Camargue. It is at the heart of the work that the Tour du Valat has been carrying out for several years on developing expertise in ecological restoration and carrying out innovative and ambitious projects to restore wetlands and the ecosystem services they provide (Domaine du Cassaïre, Medicyn project, Resist project). In 2023, several conferences, field visits, training courses, and presentations were given to some 250 people.

Outing during the "In the arms of the Rhone" festival
© CPIE

PUBLICATION OF THE BOOK "ECO-GRAZING AND VEGETATION RESTORATION IN MEDITERRANEAN WETLANDS"

How can extensive grazing be used to restore Mediterranean wetlands, in function of the specific features and constraints of the site and the overall objectives? What steps should be taken before implementing pastoral management? François Mesléard's study, aimed at students, managers, and scientists, is the fruit of extensive research carried out at the Tour du Valat, the results of which should help to improve eco-grazing as a method for conserving wetlands in the Mediterranean Basin.

TRAINING - HUNTING AND WETLANDS MANAGEMENT: ISSUES AND INTEGRATING HUMAN ACTIVITIES TO IMPROVE WETLAND CONSERVATION

Initiated as part of a project linking the François Sommer Foundation and the Tour du Valat, this training course, in the French Biodiversity Agency's training catalogue, brings together fifteen trainers from the three institutions every year. It targets natural area managers and hunting federation technicians. Its objectives are to understand the issues and regulations involved in preserving and restoring wetlands, to gain a better understanding of how they are managed; to learn about waterbird monitoring methods and how populations function; and to examine certain hunting practices, such as releasing game, the consequences of using lead shot, and managing water and vegetation.

MOBILISATION OF THE MEDITERRANEAN WETLANDS ALLIANCE (MWA)

In 2023, the MWA mobilised its network of civil society organisations via the Red Alert concerning the Vjosa-Narta lagoon in Albania. This protected area, recognised as being of international importance for its biodiversity, is threatened by the construction of an airport. 53 organisations representing 38 countries have called on the Albanian government to preserve the country's second-largest wetland, home to 70 threatened species and 200 bird species. The Bern Convention and the European Union have also called for the project to be suspended.

You can find all our achievements on our website www.tourduvalat.org and on our document portal tourduvalat.centredoc.fr

Field trip to the Verdier Marsh with a presentation of the botanical issues involved in wetland management
© Virginie Mauclert / Tour du Valat

MEDIAS

In 2023, our actions were the subject of 234 media reports, including 12 television reports, 16 radio programmes, 167 press articles and 39 articles on websites.

At the end of 2023, a specific press campaign was launched for the sponsorship of Greater flamingos. It highlighted the monflamant.com website. This campaign generated 85 press returns, including 4 TV reports and 11 radio broadcasts. The "open house day" organised by the Tour du Valat on 5th of February as part of World Wetlands Day (WWD) was widely publicised at local level. The national launch of this year's WWD in Hyères provided an opportunity to take stock of the situation of wetlands, particularly at regional level in the PACA region.

The threats facing wetlands were the main issues addressed this year. Climate change, water resources - particularly in the Camargue - the salinisation of land and the expansion of the Blue Crab in the Mediterranean were among the subjects most discussed.

Finally, at international level, the construction of an international airport in the protected area of the Vjosa-Narta lagoon in Albania and the over-exploitation of groundwater by intensive agriculture in the Doñana region of Spain have mobilised the international community to preserve these two Mediterranean wetlands.

TOUR DU VALAT 2.0

The number of subscribers on Facebook, X (formerly Twitter), LinkedIn and Instagram is constantly increasing. At the end of 2023, the Tour du Valat Facebook page had 4,647 subscribers (+ 427 subscribers), while 2,218 people followed us on X (+ 108 subscribers). The LinkedIn page had 5,195 subscribers (+ 1,787 followers). Finally, the Tour du Valat and Adopte un flamant Instagram accounts had 1,987 and 924 followers respectively. On average, each publication on Facebook was seen by more than 686 users, and recorded 44 interactions (shares, likes, etc.). Account X recorded 305 views and 12 interactions (retweets, comments, etc.) per publication on average. Finally, on LinkedIn, our publications were seen by 1,153 users and generated an average of 95 interactions. 144 videos are online on our Vimeo channel, with more than 3,096 views in 2023.

PUBLICATIONS MOST VIEWED AND SHARED ON SOCIAL NETWORKS

- Advocacy actions: mobilisation of international scientists to preserve the natural heritage of Doñana, appeal to the international community to preserve the Vjosa-Narta lagoon threatened by the construction of an airport;
- Publication online of the film and meeting of the partners of the project "Strengthening the capacities of civil society to better protect wetlands in the southern and eastern Mediterranean";
- Tour du Valat projects and activities (scientific projects, monitoring, fields, meetings, webinars);
- Open house day at the Tour du Valat ;
- Flamingos (sponsorship and ringing);
- Ads for Job, internships and civic services positions.

2023 IN FIGURES

4,647 SUBSCRIBERS | **254** PUBLICATIONS | **172,852** VIEWS | **11,063** ENGAGED USERS

2,218 SUBSCRIBERS | **209** TWEETS | **62,231** VIEWS | **2,529** ENGAGED USERS

5,195 SUBSCRIBERS | **191** PUBLICATIONS | **221,307** VIEWS | **18,230** ENGAGED USERS

1,987 SUBSCRIBERS | **150** PUBLICATIONS | **46,987** VIEWS | **3,869** INTERACTIONS

ADOPTE UN FLAMANT **924** SUBSCRIBERS | **210** PUBLICATIONS | **26,558** VIEWS

© A. Marquis-Soria

From left to right, then down

JULIA KAUFMANN, MARTA LAGO, NYNKE DE JONG, JOANNA LEVY, ANDRONIKI IONNA MAINOU

European Solidarity Corps volunteers

"We appreciate the opportunity to see from the inside how a research and conservation center works, meeting so many interesting and nice people while at the same time participating directly in the protection of an important ecosystem and exploring many different aspects of the job."

© Hervé Hôte / Agence Caméléon

From left to right, top to bottom

KAMEL EL BACHIR, SALIMA SLIMANI, SANAE ZINOUNI, DAVID GIRARD, NICOLE BONFILS, JOHANNA PERRET, JEAN-CLAUDE PASCUAL, JEAN-CLAUDE PIC

The accounting and human resources team

"In 2023, I joined the Tour du Valat as Administrative and Financial Director, coordinating the accounting and human resources teams, as well as the IT and canteen/housekeeping teams."

Jean-Claude Pascual

THEY SUPPORT US

Providing realistic responses to issues in the Mediterranean region, promoting and implementing integrated management processes, mobilising the most pertinent expertise, and funding projects. All our activities require the development of strategic relations with various organisations. Today, we conduct our activities in synergy with more than 300 partners throughout the Mediterranean Basin (research centres, NGOs, governmental or supragovernmental organisations, and foundations). Establishing these solid partnerships is indispensable for achieving our objectives, and we wish to thank all of our partners and financial backers.

The Tour du Valat has created links with numerous financial partners at various levels, including the following:

INTERNATIONAL PARTNERS

- EU- European Union
- FAO - Food and Agriculture Organisation of the united nations
- IUCN – International Union for Conservation of Nature
- BirdLife International

NATIONAL PARTNERS IN FRANCE

- Ministry of Ecological Transition and Territory Cohesion
- French Development Agency
- FFEM - The French Facility for Global Environment
- OFB - French Biodiversity Agency
- ANR – The French National Research Agency
- ANRT - French National Association for Research and Technology
- CNRS - French National Research Centre
- Agence du service civique / Agence Erasmus+ Jeunesse et Sport
- Conservatoire du littoral
- RNF - Réserves naturelles de France

TERRITORIAL PARTNERS

- South Region Provence-Alpes-Côte d'Azur
- DREAL Provence-Alpes-Côte d'Azur – Direction for Environment, Planning and Housing- Provence-Alpes-Côte d'Azur
- Bouches-du-Rhône Departmental Council
- Rhone Mediterranean and Corsica Water Agency
- Camargue Regional Nature Park
- National Society for the Protection of Nature
- Conservatories of Natural Areas- Occitanie and Provence-Alpes-Côte d'Azur
- Syndicat Mixte for the Protection and Management of the Camargue Gardoise

OUR PRIVATE PARTNERS & SPONSORS

ACCOR

AccorHotels has been a partner of the Mediterranean Lagoons Transfer Unit since 2004. It helps the MLTU celebrate World Wetlands Day and supports its communication campaign that promotes events in Mediterranean lagoon territories. Its employees also participate every year in a wetlands conservation project.

ALPINA SAVOIE

A manufacturer of pasta and semolina using organic durum wheat grown in the Camargue, Alpina Savoie supports a research project on biodiversity in agricultural habitats, in particular the development of ecological monitoring processes that can be carried out by local farmers who care about the environment, and would like to enhance the biodiversity of their farms

BISSON

The Bisson brand of the EKIBIO group, a member of the 1% for the planet network, is supporting the Camargue agroecology project for 3 years, with volunteer farmers adopting practices that promote biodiversity.

Fondation Crédit Mutuel

As part of a call for projects to preserve nature and the living world, the Fondation Crédit Mutuel Alliance Fédérale is supporting a project to restore ponds in the Camargue, to enable the reproduction of the large-stigma damselfly, a species of small dragonfly threatened with extinction in France and Europe.

Fondation de France

The Fondation de France supports two multi-disciplinary research projects at the Tour du Valat. Currently, a project applied to agricultural production systems aims to develop an agroecology showcase site on the Petit Saint-Jean Estate in a part of the Camargue located in the Gard, and more specifically a community composting unit.

FONDATION FRANÇOIS SOMMER POUR LA CHASSE ET LA NATURE

Grounded in the many common points linking the François Sommer Foundation and the Tour du Valat Foundation, a partnership has been established to develop and promote sustainable hunting practices, and engage in scientific activities that focus on wetland species.

Terre de liens

Fondation LÉA NATURE JARDIN BIO

Terre de liens and Léa Nature / Jardin BiO foundations support a project to introduce chiropterans (bats) into our organic vineyard at the Petit Saint-Jean Estate, as a crop aid to combat grape worms.

FONDATION FAMILLE LEMARCHAND

The Lemarchand Foundation is extending its support to the Mediterranean Lagoons Transfer Unit Consortium for three years, to ensure the conservation of coastal wetlands by mobilising a community of stakeholders. The main objective of this partnership is to give tools to key players so they can better assess the conservation status of lagoons, raise awareness of the issues, and increase the political will to better preserve them.

FONDATION PRINCE ALBERT II DE MONACO

Since the Mediterranean Wetlands Observatory was set up, the Prince Albert II of Monaco Foundation has helped the Tour du Valat to assess the status and trends of wetlands in the Mediterranean Basin, in particular by developing indicators concerning their water resources and biodiversity.

Roche

Roche supports the Foundation's health-environment program through the "ONE HEALTH" approach, which takes into account the close links between human health, animal health, and ecosystem health, as well as raising public awareness of wetlands and their issues.

Listel

A historically established company in the Camargue, Listel wishes to become increasingly involved in the preservation of this territory. As part of its global strategy to enhance the species richness of this very special nature and as part of its ethical approach, it wishes to help safeguard biodiversity in the Camargue.

WWF

As part of a partnership on wetlands restoration in mainland France, WWF France supports several field projects: restoration of agricultural wastelands on the Cassaïre and Petite Forêt sites in the Camargue with the Friends of the Vigueirat Marsh, restoration of degraded wetlands for and through the conservation of the Lestes macrostigma and other endangered damselflies and dragonflies, and the evaluation of intra-lagoonal hydro-ecological continuity within two restoration projects on for the emblematic and endangered European Eel.

LUMA ARLES

LUMA Arles supports us through a project to host foreign students so we can raise their awareness of the impacts and consequences of climate change, and teach them about Nature-based Solutions. Other collaborative work is implemented within the framework of a multi-activity partnership agreement (Atelier LUMA's pilot algae farm, organisation of events and international conferences at LUMA Arles, and hosting of artists).

BUDGET & GOVERNANCE

The budget for the year 2023 amounts to 7,244,000 €

EXPENDITURE BREAKDOWN

3,600,000 € have been allocated to scientific programmes, grouped under 5 headings: “Species Conservation”, “EcoHealth”, “Management and restoration of Natural and Agricultural ecosystems”, “Wetland Dynamics and Water management”, “Science-Society Interfaces” and to the library.

1,704,000 € relates to resource services, comprising financial and administrative services, the canteen, building maintenance and the repair workshop.

781,000 € relates to the management of the Tour du Valat and Petit Saint-Jean estates.

545,000 € have been allocated to general management (including the governance of the organization as well as the representation of the Tour du Valat in major international forums) and to communication (website, activity report, etc.).

324,000 € is for ongoing investment (scientific equipment, IT equipment, etc.).

290,000 € are allocated to renovate the roofs of the hangars and to develop the wine-growing project of the Petit Saint-Jean estate.

EXPENDITURE IN EUROS

• Staff costs	**4,926,000 €**
• Running costs	**1,704,000 €**
• Current investments	**324,000 €**
• Exceptional investments Tour du Valat & Petit Saint-Jean	**290,000 €**
TOTAL	**7,244,000 €**

RECEIPTS IN EUROS

• Pro Valat Foundation	**3,421,000 €**
• Agreements with public organizations	**1,829,000 €**
• Agreements with private organizations	**1,434,000 €**
• Revenues from the estates	**370,000 €**
• Various revenue (canteen, accommodation…)	**190,000 €**
TOTAL	**7,244,000 €**

TOUR DU VALAT RECEIVE ITS FINANCING FROM A NUMBER OF SOURCES

- **47 %** of its receipts come from ProValat Foundation (3,421,000 €)
- **25 %** of its receipts come from partnership agreements with public organizations (1,829,000 €)
- **20 %** of its receipts come from partnership agreements with other private organizations (1,434,000 €)
- **8 %** of its receipts are revenues from the Estates, canteen, accomodation (560,000 €)

BOARD OF DIRECTORS

COLLEGE OF FOUNDERS

- **André Hoffmann**
  President
- **Maja Hoffmann**
  Vice-President
- **Vera Michalski-Hoffmann**
- **Isabel Hoffmann**

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- **Cécile-Marie Lenglet**
  Subprefect of Arles, representative of Ministry of home affairs
- **Sébastien Forest**
  Regional Director of the DREAL PACA, representing the Ministry of Ecological Transition and Territorial Cohesion
- **Jean-Luc Parrain**
  Regional Academic Delegate for Research and Innovation representing the Ministry of Higher Education, Research and Innovation (DRRT PACA)
- **Patrick de Carolis**
  Mayor of Arles

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- **Thymio Papayannis**
  Honorary Member, senior MedWet advisor (Greece)
- **Dr. Clairie Papazoglou**
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- **Dr. Paule Gros**
  Deputy Secretary, Founder and CEO of Biodivearth (Switzerland)
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- **Dr. Sylvie Goyet**
  Deputy Treasurer, Deputy Coordinator, Head Environmental Activities, Organization for Security and Co-operation in Europe (OSCE)

SCIENCE AND CONSERVATION COUNCIL

- **Dr. Yann Laurans**
  Programmes Director, WWF France; President
- **Prof. Debbie Pain**
  Honorary Professor, School of Biological Sciences, University of East Anglia; Honorary Research Fellow, University of Cambridge, UK; Vice-President
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- **Prof. Elena Kazakou**
  Professor of Comparative Ecology of Organisms, Communities and Ecosystems, Montpellier SupAgro, France
- **Prof. Phoebe Koundouri**
  rofessor Athens University of Economics and Business & Technical University of Denmark, President EAERE (European Association of Environmental and Resource Economists), Chair SDSN Global Climate Hub, Co-chair SDSN Europe
- **Dr. Ana Rodrigues**
  Senior Researcher, Centre d'Ecologie Fonctionnelle et Evolutive (CEFE-CNRS), Montpellier, France

Members of the Board of Directors
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TO JOIN US

No matter how small, all of your donations make a difference and help the Tour du Valat continue working for the common good. There are several possibilities to support wetlands research and conservation.

More than 4,000 sponsors have already joined the adventure and adopted flamingos. The more people who adopt a flamingo, the more the species will be monitored, understood, and protected in the Mediterranean.

So, why don't you adopt a flamingo now?
monflamant.com

ADOPT A FLAMINGO

The Tour du Valat invites you to "adopt a flamingo" for a year, or more if you feel like it. A fun way to learn more about this mysterious bird. It is also an original way of preserving the wetlands that these birds love so much and without which they obviously cannot live.

Just browse through our website monflamant.com and you're sure to find just the right flamingo for you. There are many to choose from: you can adopt one of our mascots, discover the fabulous stories of our four flamingo families, and find the one that best corresponds to you, or choose a flamingo according to his or her age and sex... and give him or her the name of your choice.

TAX-DEDUCTIBLE SUPPORT

The Tour du Valat Foundation is recognised as a public interest organisation and is therefore entitled to receive donations. 66% of your donation is tax deductible up to a limit of 20% of your taxable income (for French residents). A 100 € donation will only cost you 34 € after tax deduction.

CORPORATE SPONSORSHIP

Whatever our sector of activity, we all have a stake in preserving nature and biodiversity. That's why everyone, employees and managers alike, can suggest setting up a corporate philanthropy scheme within their company. As well as uniting employees around a common cause, the company can benefit from a reduction in corporation tax of up to 60 % of its financial support.

Contact and information, Béatrice Guenebaud : 04 90 97 28 77 / guenebaud@tourduvalat.org

MAKE A DONATION OR BEQUEST

If you share the same values as the Tour du Valat, if you appreciate the quality and independence of our work, and if you are convinced that a healthy natural environment is essential for building tomorrow's world together, you can act in the long term and support us in our work by making a donation or a bequest to the Tour du Valat Foundation. We will assist you in this process, in accordance with the law and with respect for individuals.

For further information, do not hesitate to contact our specialist Anne Ackermann:
04 90 97 20 13 / ackermann@tourduvalat.org

VISITING US

TOUR DU VALAT ESTATE

Private estate open exceptionally on occasions each year to the general public:

- on World Wetlands Day (February);
- on the Festival of the Camargue and the Rhône Delta (May);
- together with the Bureau des Guides Naturalistes (BGN), paying guided visits on reservation.

Two sites are also open to the public on a permanent basis:

- the Verdier Marshes, located north of the village of Le Sambuc on D36;
- the Grenouillet Lagoon observation platform located on the road from Fiélouse to Le Sambuc that links D36 road to the Vaccarès Lagoon, just north of the Tour du Valat.

PETIT SAINT-JEAN ESTATE

Tour du Valat agro-ecological farm and wine estate, where guided tours and wine tasting are organised:

- during the "Farm to Farm" event (April);
- on the Festival of the Camargue and the Rhône Delta (May);
- in partnership with Passion Nature Camargue - paying visits and tastings on reservation;
- together with the BGN, paying guided visits on reservation;
- group visits possible on reservation at petitsaintjean@tourduvalat.org

If you wish to receive information about the programmes and other events organized at the Tour du Valat for the general public, you can apply by filling in the form on our website please contact us at: secretariat@tourduvalat.org

WWW.TOURDUVALAT.ORG

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Guillaume Baldini

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El Hotba on the Sidi Moussa lagoon complex Oualidia, Morocco © Jocelyn Champagnon

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