

TOUR DU VALAT

ACTIVITY REPORT 2021



Tour
du
Valat

Research institute
for the conservation
of Mediterranean
wetlands



TOUR DU VALAT TEAM

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EDITORIAL

INTERDEPENDENCE Two years. Humanity has been struggling to cope with the successive waves of the current health crisis and its many consequences for over two years. Now, in addition to the despondency and resignation caused by this never-ending pandemic, comes the shock and anxiety of a new conflict at the gates of Europe. These moments of rupture represent a major challenge. They are conducive to returning to what is essential, to a more vigorous search for the conditions of well-being, and even happiness.

One of the beautiful lessons of this crisis was our astonishment at nature's resilience when the lockdown was accompanied by the blossoming of nature. As soon as our frantic rush, omnipresence and noisiness faded, the wildlife that is usually confined to protected areas moved into the areas we usually occupy. There was also the sudden need felt by so many of us to come closer to nature, to reconnect with the living world.

These successive crises are revealing a little more every day the extent to which our development model, built on an interdependence between our economies and our production systems without solidarity, has increased our vulnerability. We should instead cultivate another form of interdependence. One that links us in solidarity with the living world, of which we are an integral part. One that increases our resilience and our capacity to adapt to a rapidly changing world.

We should also remember the vital contributions made by wetlands. These marshes, lagoons, and temporary ponds have always been the companions of our daily lives, supporting our ways of living, especially in the Mediterranean Basin. Yet we have neglected them, treating them as if they were only there to draw from with no limits, without taking into account their contribution to our system, without really perceiving the multiple contributions they make. We must reconnect to these environments! They are beautiful and useful, two characteristics that should inspire our commitment to them!

According to a popular saying, we only protect what we love, and we love what we know. Let's learn together to understand, love, and protect these essential wetlands! For nearly 70 years, the Tour du Valat has been working to develop this knowledge, to rebuild these links, to reconcile humans with nature. In order to contribute to this project even more effectively, a new programme and a renewed internal organisation were set up in 2021 to apply the fundamental aspects of our actions that you will discover by reading our Annual Report.

ANDRÉ HOFFMANN
PRESIDENT

JEAN JALBERT
DIRECTOR GENERAL



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THE TOUR DU VALAT

Created more than 65 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 Council, a body of internationally acclaimed scientists from major fields of wetlands research and conservation.

OUR LIFEblood

The Tour du Valat team included 78 talented individuals in 2021 with an additional 4 doctoral students hosted on a non-contractual basis, which in all represents 67 full-time equivalent positions (27 women and 40 men).

In addition to two volunteers (one Belgian and one Slovenian), two new Spanish recruits joined our team recently, while civic service volunteers began their volunteer internships to bolster the five who were already present.

Finally, as is the case every year, we offered twelve 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.

Inauguration of the Luc Hoffmann
building, 28 October 2021
© Iris Millot / Victor&Simon



1954



FOUNDED BY LUC HOFFMANN

78



EMPLOYEES



AROUND
1 600 scientific
PAPERS PUBLISHED

98
PhD



PROJECTS IN
+ THAN **20**
MEDITERRANEAN
COUNTRIES
AND + THAN **300**
PARTNERS



ORGANIC
AGRICULTURE AND
AGROECOLOGY

WETLANDS,
are very productive
yet highly threatened areas



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



Throughout
the world



In the
Mediterranean
Region

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



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NICOLAS BECK

Manager of the Petit Saint-Jean Estate & Manager of the buildings, energy and waste

DAMIEN COHEZ

Conservation Officer at the Regional Nature Reserve & Manager of the Tour du Valat Estate

“It is a great honour to be the Managers of the magnificent Tour du Valat and Petit Saint-Jean Estates! Preserving their exceptional natural heritage, developing agro-ecological projects, optimising the energy consumption in the buildings for the comfort of all, and upcycling waste: these are some of our major missions!”

— THE ESTATE

These estates 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, and 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.

The Tour du Valat Estate covers nearly 2,700 hectares in two different geographical areas in the Camargue: the Tour du Valat Estate itself, near the village of Le Sambuc (a commune of Arles, Bouches-du-Rhône) (2,548 ha, 1,845 ha of which is classified as 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.

— TRADITIONAL ACTIVITIES (LIVESTOCK, AGRICULTURE...)

The Tour du Valat has its own open range livestock on the central part of the site and other parts of the Estate are grazed by the herds of well-known local ranchers. In 2021, 450 cattle and 70 horses grazed on the site. At the Petit Saint-Jean Estate, a small herd of twenty Raïole sheep (a species rather low in numbers originally from the Cévennes) was introduced to control vegetation in the vineyards, meadow orchards, and areas where there is a risk of wildfires.

— AN AMBITIOUS PROJECT TO SHOWCASE AGRO-ECOLOGY

On the Petit Saint-Jean Estate, the agricultural plots are cultivated according to the principles of agroecology and lead to various productions: alfalfa, potatoes and sweet potatoes, olives, almonds and pomegranates. In 2021, two last plots of vines were planted with a mildew and powdery mildew resistant grape variety and a Georgian grape variety. The 15 grape varieties currently in place enable diversified vinification. All the agricultural activities meet the specifications of organic farming and are part of a project in which viticulture, agro-forestry and diversified pastoralism are developed in order to respond to current issues such as climate change, and the erosion of biodiversity.

Supervised hunting also takes place on the Estate: three hunting groups can hunt according to precise rules. Lead shot was banned in 1994 for small game and in 2019 for wild boar. The hunting groups also contribute to various scientific studies by keeping hunting registers and submitting animal gizzards.

The Tour du Valat also actively participates in the local effort to regulate the wild boar population by organising hunts, shootings to protect crops, and bow hunting in the most fragile areas.

The Petit Saint-Jean Estate
© Victor & Simon





A flock of greylag geese with a snow goose in the middle

© Damien Cohez

BIODIVERSITY ON THE ESTATE

In 2021, the Tour du Valat properties – including the Verdier marshes and the Petit Saint-Jean Estate – were included by the International Union for Conservation of Nature in the Green List of protected and conserved areas, joining the 58 other sites that form the still very small family of the best managed sites on the planet. Quite an achievement!



Réserve Naturelle Régionale
TOUR DU VALAT

BEAUTIFUL OBSERVATIONS AND DISCOVERIES ON THE TOUR DU VALAT ESTATE

In terms of insects, three observations caught our attention:

- a nocturnal butterfly, the **Small Emperor Moth** (*Saturnia pavonia / pavoniella*). The Giant Emperor Moth (*Saturnia pyri*) is present on the site, but the Small Emperor Moth had never been observed;
- a large aquatic beetle, the **Dysticus circumflexus** (*Dysticus circumflexus*), the first on this site;
- an exotic wasp (*Psenulus carinifrons iwatai*) was present for the first time in France. Originally from Japan, this wasp was introduced in Italy and nests in dry and hollow stems of Phragmites. Its presence in the Camargue is probably well established, which is not very good news!

2021 was rather quiet as far as plants are concerned, since conditions were not very favourable for their development. However, a new station of *Riella cossoniana* was discovered in the Verdier marshes.

In order to maintain waterfowl populations on the site in a context that was once again not very favourable, with very little rainfall, the Saint-Seren and Baisse Salée marshes were kept flooded throughout the summer.

¹ Le Divelec R., 2021- *Psenulus carinifrons* (Cameron, 1902), une nouvelle espèce exotique pour la faune de France (Hymenoptera, Psenidae). Bulletin de la Société entomologique de France, 126 (4), 2021 : 447-451.



Pacific Golden Plover
© Damien Cohez

In the Saint-Seren, the vast mudflats and watery areas were of particular benefit to wading birds and the Garganey. But this management also favoured the growth of numerous stations of invasive exotic plants, heteranthera and Halmifoli.

In the Baisse Salée, it is mainly the shorebirds that benefited from the site, with groups of Red Knots (unusual for the site) and Silver Plover. Amongst them, two accidental species were detected: a Pacific Golden Plover originating from Siberia and a Buff-breasted Sandpiper originating from North America.

Other rare birds sighted in 2021 include:

- a Snow Goose (probably escaped) at the Saint-Seren in April;

- a Black-winged Pratincole which again visited the Collared Pratincole colony;
- flocks of Rosy Starling: up to 66 birds in the mulberry trees around the farmhouse;
- an Indian Rosefinch, captured during a ringing session;
- a Little Bustard on the Moncanard steppe;
- and a young Cinereous Vulture, originally from the Cévennes, which visited several protected areas including the Coussouls de Crau Nature Reserve, the Étangs et Marais des Salins de Camargue, and the Tour du Valat.

HOSTING BATS AT THE PETIT SAINT-JEAN ESTATE

With support from the Terre de Liens Foundation and Léa Nature / Jardin BiO Foundation, we have installed forty bat roosts in the hedgerows between the vineyard plots. Bats are known to be great consumers of grape worm moths, which are the main pests of grapes.

In the first season, 95% of the roosts were occupied by at least one pipistrelle. Acoustic detection allowed us to count 14 species among the 17 identified in the Camargue. The main colony of Soprano Pipistrelle was estimated to house more than 500 individuals.



© Rosalie Parent

Cohabitation on the Estate
© Damien Cohez





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BRIGITTE POULIN / GAËTAN LEFEBVRE

Director of Research / IT Manager

After 25 years of research and discoveries, of finding solutions to thorny problems, the time has come for the Reed Queen and the Network King to say goodbye.

THE PROGRAMME

2021, A TRANSITION YEAR

2021 saw the launch of our new five-year strategic plan, under the leadership of an entirely new programme management/coordination team. There was a smooth transition, thanks in particular to intense upstream work involving all staff and governance bodies. The key elements of our philosophy and theory of change remain the same, as does our leitmotif «understand/manage/convey/convince». The new configuration allows us to further strengthen transversality within our teams, and to become more effective and have more impact, while maintaining the scientific excellence that is the historical strength upon which the Tour du Valat's legitimacy is based.

At the local level, in the Camargue, the legitimate concern of various stakeholders about a degraded environment and the now tangible effects of climate change is growing. Sea level rise, irregular and decreasing rainfall, and soil salinisation are increasingly worrying, and call for improved cooperation between all stakeholders to better prepare the future of the Camargue together.

On the international scene, Tour du Valat was significantly involved in the International Union for Conservation of Nature (IUCN) World Conservation Congress, held in Marseille in September, both as an IUCN member, and by proposing and signing several motions, including one on the implementation of Nature-based Solutions in the Mediterranean, as well as by contributing to and co-organising over twenty technical and scientific events. This Congress confirmed the Tour du Valat's strong commitment to stakeholders from around the Mediterranean Basin, many of whom were physically present after more than one year of «remote» exchanges. Another such key event was the official launch in March of the Mediterranean Biodiversity Consortium, which brings together the Tour du Valat and six other key players working hand in hand to protect the Mediterranean environment. The Consortium is already working on an ambitious regional project to test and promote Nature-based Solutions.

It is a good example of the new technical and financial partnerships initiated in 2021. The year had begun with some concern about the financial trajectory of the Tour du Valat after the MAVA Foundation, one of its key historical partners, stops its operations at the end of 2022. Thanks to a major collective effort, our increased search for external funding was successful. This good news is not only financial: the new partnerships encourage us to further increase our impact while consolidating our scientific production and networks.

AND NOW, 2022!

2022 will be marked by implementation of the many new projects already in progress, without abandoning the bold spirit that prevailed in 2021. A special effort will also be devoted to the co-construction, with all the stakeholders involved, of a resilient future for the Camargue, a delta that is emblematic of several major challenges facing the 21st century.

RAPHAËL BILLÉ
PROGRAMME DIRECTOR



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A major stopover for European waterbirds, the Shirkela maya is one of the larger ponds within the Khor Abu Habil inner delta (Sudan)

© Pierre Defos du Rau / Jean-Yves Mondain-Monval (OFB)

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 taxa for which we have had expertise for many years: birds, fish, and amphibians. Our goal is to address threats such as salinisation due to climate change and the development of energy infrastructure such as wind turbines, and dams that prevent ecological connectivity, so as to produce a positive effect on the dynamics of the populations targeted by our studies.

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

PROJECTS

1 Reversing the decline of threatened populations

JOCELYN CHAMPAGNON |
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The main success this year was obtaining funding that will enable us to conduct a new scientific and management program in the Camargue that concerns the European Eel, a critically endangered species (COLAGANG project in partnership with the French Biodiversity Agency and Amélie Hoste's Ph.D. project).



Eel swimming in the Gardon
© Julien Dublon

Eels thrive in the Camargue Delta, but they may encounter difficulties in migrating to the silver stage, which is detrimental and damaging to their life cycle. For instance, silver eels can be trapped in canals, with no way to return to the sea and reproduce. The goal of this project is to study the movements of eels within the Delta and to compare their growth in different lagoon habitats, from demographic, eco-toxicological, and health points of view.

Eurasian spoonbill
© Hugo Ferreira



2 Providing management solutions that improve the status of vertebrate communities

ARNAUD BÉCHET | bechet@tourduvalat.org

David Vallecillo successfully completed his Ph.D. in late 2021. By applying statistical models on count data of waterbirds that winter in the Camargue, the abundance estimate could be corrected by the observer effect in order to improve the real long-term population trend. At the ecological level, hydraulic management (salinity and water area) was identified as the driver of the temporal and spatial changes in Common Teal abundance in the Camargue over the last decades. These results have direct implications for wetland managers and hunters. We also developed an online course in English on monitoring breeding waterbirds in Mediterranean wetlands. It targets bird and bird habitat managers, students, professors, researchers, ornithologists, and experts from Mediterranean countries who have some bird counting experience.

3 Ensuring ecological connectivity for species migration and dispersal

DELPHINE NICOLAS | nicolas@tourduvalat.org

The effect of migratory choices of flamingos and spoonbills was evaluated using long-term tagging and new GPS devices (see attached focus). In spoonbills, preliminary results show that there is no effect related to their migration route, but that the survival of birds migrating over long distances is lower than that of birds migrating over short distances. Finally, an important wetland was proposed as a Ramsar site in Sudan: the Khor Abu Habil inner delta.

Is the journey worth it? Immersion in Greater Flamingo migration strategies

THE GREATER FLAMINGO, A LONG-LIVED SPECIES WITH CONTRASTING MIGRATORY BEHAVIOUR

The Greater Flamingo, one of the most emblematic species of the Camargue, is known for its remarkable longevity. Birds born in the Camargue now live up to 45 years, while birds in captivity have well exceeded 60. This species is also known to travel extensively, particularly throughout the Mediterranean Basin. For the birds from the Camargue, there are different forms of migratory behaviour, ranging from wintering where they live to travelling to West Africa every winter. These different strategies reflect trade-offs between the risks involved in migration and the benefits of wintering in more clement conditions where food is abundant. Consequently, these different migration strategies are expected to result in different survival or reproductive success.

DIFFERENT LIFE TRAJECTORIES?

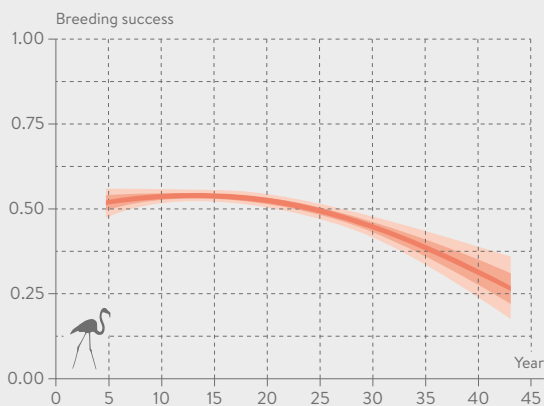
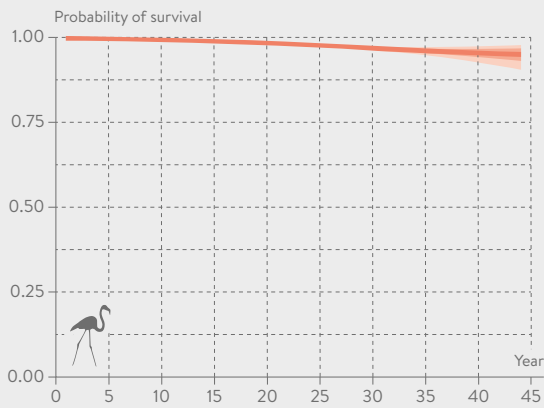
To migrate or not to migrate? A previous study shows that adult flamingos that winter in Africa have a higher survival rate than resident birds. That study suggests that differences in population dynamics with regard to different migratory strategies exist in the Camargue population of Greater Flamingos. That is why in 2021, and thanks to the data collected in the long-term study of the Camargue Greater Flamingo colony since the start of chick ringing in 1977, new analyses were carried out to investigate potential differences in survival, breeding probability, and reproductive success between birds with different migratory strategies. We also wanted to assess how the patterns of these demographic parameters vary with age according to different migration strategies.

Greater Flamingos migrating along
the western Mediterranean coast

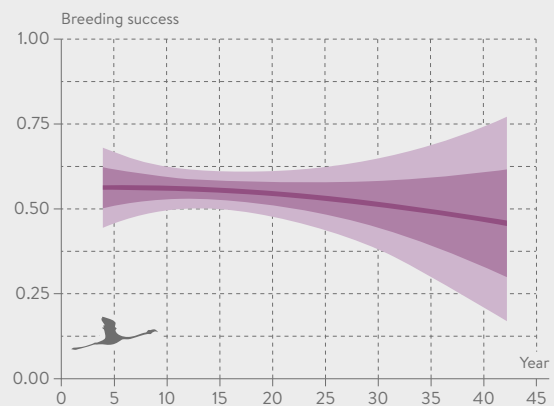
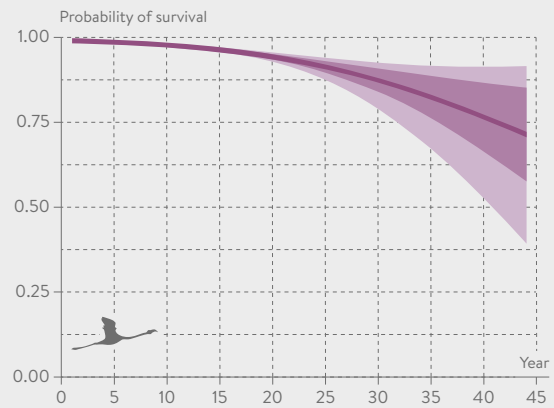
© Sébastien Roques



Residents



Migrators



Probability of survival and breeding success of Greater Flamingos according to age and migration strategy (orange: residents, purple: migrators)

Thanks to re-sightings of individuals during the breeding season and the winter period, we were able to estimate these different patterns of evolution as a function of age using mathematical modelling tools. We were able to show that migratory flamingos have a lower survival rate which decreases more rapidly over their lifetime than resident birds (cf. graphics). This difference is probably due to the different costs incurred by the migratory journey: energy costs and the risk of encountering unfavourable events are higher. To compensate for what could be called a “lower longevity”, migratory flamingos have a higher reproductive success at the beginning of their life than resident birds. Moreover, this success decreases less rapidly with age.

These results thus highlight the influence that migration strategies can have on the overall demographic dynamics of a species for which several strategies coexist within the same population.

These results also raise new questions. Is it travel that accelerates ageing? Or is it rather the strong investment in reproduction at the beginning of life that is at the origin of the lower survival of migratory flamingos? This work opens many avenues of reflection on the influence of migration strategy on the demographic dynamics of a population.

POSTDOCTORAL CANDIDATE

Sébastien Roques

SUPERVISORS

Arnaud Béchet and Jocelyn Champagnon

FINANCIAL PARTNER

Tour du Valat “Adopt a Flamingo” programme



Fyke net installed for our pond turtle monitoring
© Jean E. Roché

Health Ecology

Pollution is a major threat to Mediterranean wetlands, and it has 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 goal of this theme is to contribute to limiting the impacts of pollution and infectious diseases (which are often linked) on the biodiversity of wetlands, by developing long-term studies that focus on the wide range of diseases and pollutants to which individuals are exposed.

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 in order 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.

In 2021, our projects were mainly focused on area 1 with two projects that study the impacts of pollution on long-lived vertebrates in different habitats. The two study models concern the Yellow-legged Gull (*Larus michaellis*) and the European Pond Turtle (*Emys orbicularis*).

MARION VITTECOQ | COORDINATOR

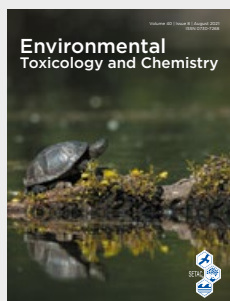
PROJECTS

1 The European Pond Turtle, a sentinel species for wetland contamination status

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Studies on the impact of contaminants on the European Pond Turtle are being continued in the Camargue and will be developed nationally in 2022. An article showing the low presence of persistent organic pollutants (POPs) in the plasma of European Pond Turtles in the Camargue was published in 2021. It was written



within the scope of Louisiane Burkart's Master's thesis (*Burkart et al. 2021*). The determination of 21 pesticides and 8 metabolites in the same plasma was also carried out by Yvann Foucault as part of his Master 2 internship. Initial findings show that 24 of the 29

molecules sought were detected. The analysis of these contamination data collected since 2018, with assistance from the Rhone Mediterranean Corsica Water Agency, will be the focus of Leslie-Anne Merleau's thesis, which she started in October 2021.

Finally, funding from the ECOPHYTO2 plan has been obtained for a three-year national study on exposure to phytosanitary products and their effects on the European Pond Turtle.

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

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Monitoring of the Yellow-legged Gull colony in Port-Saint-Louis-du-Rhône continued in 2021. In addition to the demographic monitoring that we have been conducting for several years, we now collect data on contamination (heavy metals, plastics, etc.) and parasitism (ticks, antibiotic-resistant bacteria, etc.). These data are gathered in addition to individual movement and survival monitoring in order to understand how these different stressors impact the species, but also how they may impact humans. Having obtained funding from the French National Research Agency, and with Karen McCoy's team at the University of Montpellier, this year we extended our study to the entire French Mediterranean coast, as well as to colonies in Spain and Tunisia. We also placed a dozen GPS tags on adults and chicks in order to more precisely understand the precise areas in which the individuals studied move about. We sampled ten colonies in 2021, in order to choose five that will be monitored in 2022 and 2023.

Heading for the Yellow-legged Gull colony
© Sandra Hodić



The impact of plastics on Yellow-legged Gulls

In natural populations, individuals are subject to various stressors such as parasites and ones linked to their activities. While the impact of parasites on the one hand, and the consequences of anthropogenic stresses on the other, have already been extensively studied separately, little is known about the interaction between these different types of stress and how they affect the dynamics of natural populations. This explains why Florence Droguet, a doctoral student at MIVEGEC and the Tour du Valat, is undertaking a thesis on the combined impact of plastics and parasites on the population dynamics of Yellow-legged Gulls, with a first chapter focusing on their exposure to plastics.

Plastic waste has become a major threat to the environment and biodiversity in recent years. These plastics can be ingested by wildlife intentionally because of their similarity to prey. But these ingestions can also be accidental – plastic attached to prey – or indirect when the prey itself has ingested plastics. In the latter case, there is accumulation via the food chain. The ingestion of these plastics is likely to increase the risk of mortality of individuals, either physically by reducing or blocking food intake, or through the toxicity of the molecules associated with the plastics.

Gulls are particularly vulnerable to plastic ingestion when feeding on anthropogenic resources. They are known to adjust their diet during the breeding season in order to feed their chicks better quality food.

Yellow-legged Gulls
© Irène Badone



In order to verify whether Yellow-legged Gulls do the same, 143 regurgitated pellets were collected from the Carteau colony in Port-Saint-Louis du Rhône during the 2020 breeding season. Of these pellets, 83.9% (n=120) contained at least one piece of plastic. Plastic films were the most common forms of plastic in these pellets. They came from food packaging, garbage bags, and possibly farm plastics used in fields.

Regurgitated pellets collected
© Patrick Landmann



Contents of regurgitated pellets
© Carole Leray

The quantities of plastic found in the pellets before and after hatching were compared and a significant decrease in the quantity of plastic was observed after hatching with 0.76 pieces of plastic per pellet

after hatching compared to 2.26 pieces before hatching. These results suggest that these gulls may be adjusting the food they feed their chicks by switching to a more digestible food, and therefore, containing less plastic. However, plastics are still found in the pellets of adults after the eggs have hatched suggesting that the chicks are exposed to plastic pollution with potential impacts on their development and survival. Studies are being conducted to verify this finding.



Yellow-legged Gull chicks in their nest
© Patrick Landmann

PHD STUDENT

Florence Droguet, MIVEGEC - Tour du Valat

SUPERVISORS

Karen McCoy (MIVEGEC) and Marion Vittecoq (Tour du Valat)

TEAM

Carole Leray (Tour du Valat), Thomas Blanchon (Tour du Valat) and Charly Souc (MIVEGEC)

PARTNERS

Technical: Alexandra ter Halle (IMRCP), Jennifer Provencher (ECCC)
Financial: Programme CNRS MITI "Health Ecology" & ANR EcoDIS (ANR-20-CE34-0002).



Planting a field hedge with school children from Le Sambuc (Verdier Marshes), December 2021
© Virginie Mauclet

Management and restoration of natural and agricultural ecosystems

Various strategies are required to conserve wetlands and promote their biodiversity in the natural habitats and agricultural areas that surround them. An important strategy within this theme is restoration ecology, which addresses the threats of habitat destruction, problem species, modification of natural systems, and the encroachment of open spaces. Our goal is to find effective restoration practices that will help restore or improve the environmental status of key wetland habitats. Most of our restoration activities are first tested in the Camargue and then transferred to other Mediterranean wetlands through training, conferences, and expert advice at different pilot sites.

Adaptive management practices address the threats linked to habitat destruction, the modification of natural systems, pollution, the encroachment of open spaces, and unsustainable management. This strategy aims to improve the condition of wetlands by integrating forecasts of climate change, ecosystem evolution, and socio-economic trends into management decisions, and to improve management methodologies through the critical evaluation of new theoretical concepts applied to real management situations. The Tour du Valat estates are experimental sites that showcase and promote different agroecology and natural area management techniques and methodologies.

LISA ERNOUL | COORDINATOR

PROJECTS

1 Wetland management and restoration

LISA ERNOUL | ernoul@tourduvalat.org

In order to preserve a wide range of landscapes and improve wetland management, we are testing management and restoration methodologies and approaches at various sites in the Camargue and the Mediterranean Basin. The Interreg *Tune Up* project applied the “environmental contract methodology” to the Étangs et Marais des Salins de Camargue (EMSC). This approach marked the launch of the development of a new management plan for the site based on a participatory process. The inventory and assessment of the site were drawn up this year, and significant ecological monitoring was conducted. On the 17 hectares of reedbeds on the Tour du Valat Estate and in the Verdier Marshes, the works completed have clearly improved hydraulic management to the benefit of palustrine birds, in particular the Eurasian Bittern. We also capitalised on the effects of previous restoration and management actions, including mosquito control, with new scientific articles to inform the general public and conferences that had a direct impact leading to the decision to stop spraying Bti on more than 22,500 ha in Quebec.

Wetland restoration is based on the recreation of favourable abiotic conditions, the provision of target species propagules, and the control of undesirable species in order to direct ecosystems on desired trajectories. We make use of ecological engineering and existing techniques or ones to be tested in restoration ecology – transfer, propagule control, competition control – as well as on the main wetland management tools (hydrology, herbivory), with a preference for experimentation.

Among our current projects, four target the restoration of temporary ponds and marshes in the Camargue. They focus on:

- the effects of three types of hydrological management: (1) hunting (marsh flooded in summer), (2) Mediterranean (marsh flooded in autumn), (3) and intermediate, on biodiversity compartments (plants, birds, dragonflies, etc.) and the benefits for hunting. Our objective is to reach a compromise in terms of water management that reconciles nature conservation objectives and the use of marshes for hunting;

- re-creation by hydrological management and grazing of a 14-ha temporary marsh (Petit Badon Estate);
- assessment of the success of the restoration of 25 temporary ponds created in the Camargue from the 19th century to the present day.

Habitat restoration is also a major priority in the regional version of the second National Action Plan for threatened dragonflies. This plan will be operational for 10 years, starting in 2021.

2 Studying and promoting agroecology

ARNAUD BECHET | bechet@tourduvalat.org

This year we worked at different scales to initiate various agro-ecological activities. Locally, on the Petit Saint-Jean Estate we sampled invertebrates in the vineyards according to the distance from the nearest hedge in order to determine the role of the green infrastructure on auxiliary species (Epi'haie project - Fondation de France- FdF).

Moving on to the more regional scale of the Camargue, we set up spot counts of birds in spring and winter (OFB-PatriNat), and monitored dragonflies and damselflies and bats in summer in more than 45 fields in the Camargue (Camargue en Bio project - FdF) to determine the relationship between the management of field edges and post-harvest practices. To promote the planting of new hedges, we improved the spatially explicit decision-making tool Camgis, by modelling the effect of hedges on the risk of flamingo forays in ricefields and on increasing connectivity for bats (Agence de l'eau).

We also started an agro-ecology network in the Camargue Biosphere Reserve, in the aim of increasing exchanges between farmers, scientists, and site managers concerned with improving agricultural practices for biodiversity. Within that project, we have completed an initial assessment of Camargue agrarian systems using economic modelling.

Internationally, we focused on the Gediz Delta in Turkey through Dilara Arslan's thesis, which studies the major role that the transition from a landscape shaped by traditional agriculture – mainly extensive sheep grazing – to a new agricultural model dominated by irrigated cotton fields plays on the composition and abundance of bird communities.

Study of the synergies between agriculture and biodiversity and for the adoption of agroecological practices on rice farms in the Camargue

In 2019, the Tour du Valat initiated a research project on the links between agriculture and biodiversity in the Camargue. Supported by Alpina Savoie, the Fondation de France, and the French Ministry of Agriculture and Food, this research aims to identify good agricultural and landscape practices favourable to biodiversity in wetland areas.

Agricultural environments are key habitats for biodiversity. They account for 38% of the world's land area and significant species specialisation occurs in them. But biodiversity is declining faster in agricultural areas than elsewhere. Agricultural intensification is thought to be the main cause of this decline. Among the factors with the greatest impact, studies agree on the negative effects of pesticides and fertilisers, the disappearance of semi-natural environments such as thickets, wetlands, and meadows, and the decrease in the area of field edges.

Camargue agricultural landscape
© Lionel Roux





Camargue agro-biodiversity
© Lionel Roux

dragonflies, and chiropterans present in 90 agricultural plots in the Camargue. With these data, an initial research question could be investigated: can the edges of plots be used as substitute habitats by birds? Our results show that hedges and lines of reed are important for edge birds and reed passerines. In addition, we note that the edge management method used is significant, as the presence of hedges is, for example, negatively correlated with the abundance of grassland birds, which do not find any resources there, and which can be corridors for potential predators. Management choices made for certain developments, such as hedge planting, are therefore vital in order to balance between the benefits for certain species and the costs for others. We are continuing this work in collaboration with the Bagap Unité mixte de recherche in Rennes in order to spatialise and prioritise the planting of hedges along the edges of fields in the Rhône Delta.

There are many prospects for future research. We will try to evaluate which wintercropping practices are the most favourable for wintering birds and the effect of the landscape on chiropterans in order to maximise their role as crop auxiliaries. In addition, we are supporting farmers wishing to develop agroecology on their farms, with the organisation of several days of training and the purchase of 65 nesting boxes and 20 bat shelters, which will be installed in 2022.

¹ Mallet P., Béchet A., Galewski T., Mesléard F., Hilaire S., Lefebvre G., Poulin B., Sirami C. 2022. Different components of landscape complexity are necessary to preserve multiple taxonomic groups in intensively-managed rice paddy landscapes. *Agriculture, Ecosystems & Environment* 328:107864. doi: 10.1016/j.agee.2022.107864

Our first study was based on large-scale biodiversity data collection carried out in 2013 in the Camargue, which enabled us to record 7 taxa across 32 Camargue landscapes. Our analyses showed that the use of phytosanitary products has an influence on how important landscape elements are as refuge areas for biodiversity. We also showed that different landscape components influence the diversity of different taxa, and that these taxa respond in contrasting ways to the different landscape components. For example, grass strips favour birds and spiders, while bees are favoured by the presence of irrigation channels. It is therefore necessary to preserve a mosaic of landscape elements within the agricultural matrix.

In 2020 and 2021, new field campaigns were carried out to sample breeding and wintering birds,



Great Reed Warbler (*Acrocephalus arundinaceus*). A reed passerine dependent on reedbeds, but which finds an alternative habitat in the lines of reed that border the irrigation and drainage canals along Camargue rice fields

© Thomas Galewski

PHD STUDENT

Pierre Mallet, a Ph.D. student supported by the Ministry of Agriculture and Food, whose research is co-supervised by the Tour du Valat, the Dynafor UMR, and the Mediterranean Institute of Marine and Terrestrial Biodiversity and Ecology (IMBE)

PARTNERS

Scientific: UMR Dynafor • Mediterranean Institute of Marine and Terrestrial Biodiversity and Ecology (IMBE)

Financial: Alpina Savoie • Fondation de France • French Ministry of Agriculture and Food

RETROSPECTIVE — 2021



© Tour du Valat



FINALLY DECONFINED

June, we gathered in the old farmhouse courtyard to taste the latest Petit Saint-Jean estate wines.



MUSICA!

Thanks to Lucia Llorente Zubiri, a European Solidarity Corps volunteer, for creating the new Tour du Valat anthem "I know a place...".

© Tour du Valat

A BREATH OF FRESH AIR

A small glimpse of the interior decoration of the new Luc Hoffmann building.

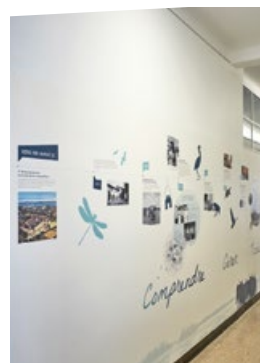
© Iris Millot_Victor&Simon



WELL-DESERVED RETIREMENTS!

We all thank Patrick Grillas and Olivier Pineau for their long commitment to the Tour du Valat.

© Tour du Valat





2021 SCIENCE COUNCIL

© Tour du Valat



DAZZLED BY FLAMINGOS!

© Tour du Valat

Souvenir photo of the "Adopt a Flamingo" team on the first sponsors' day.



WORLD CONSERVATION CONGRESS

© Tour du Valat

The Tour du Valat was very active in Marseille.



FRIENDS OF THE TOUR DU VALAT

© Tour du Valat

Last General Meeting in June.



© Tour du Valat

INTERNATIONAL RECOGNITION

Damien Cohez and Virginie Mauclert at the ceremony for the IUCN Green List label awarded to the Tour du Valat for its exemplary estates.

FIELD TRIP

General Meeting of the Mediterranean Wetlands Alliance.

© Tour du Valat

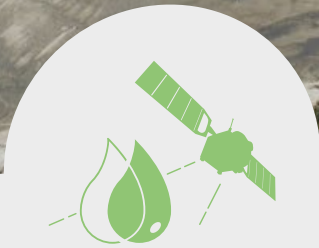


© Iris Millot, Victor&Simon



A PRIVATE MOMENT

André and Maja Hoffmann in the shadow of the Palunette.



Overwash zone and canals studied in the southern part of the EMSC for the REST-COAST project
© Loïc Willm & Antoine Arnaud

Wetland dynamics and water management

Climate change is exacerbating current environmental problems in the Mediterranean Basin, due to a combination of changes in land use – in particular the conversion of natural wetlands to urban and agricultural areas or artificial wetlands – unevenly distributed water resources, and increasing pollution.

Land use and water management choices and policies are complex processes resulting from many socio-economic factors. They involve stakeholders who sometimes have 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. It is therefore essential to help managers, decision-makers, and stakeholders to better understand the main factors driving the dynamics of natural habitats, and water quantity and quality. We must also help them to manage water sustainably, by taking into consideration all the issues and uses of these areas including biodiversity, and short-term as well as long-term human activities.

In this context, our team carries out research aimed at:

1. informing and raising the awareness of decision-makers, stakeholders, and site managers of the changes affecting Mediterranean wetland habitats (losses, conversions, hydrological alterations);
2. helping them justify their water management choices:
 - with the best possible compromise for all the issues and uses of these areas (biodiversity, human activities);
 - by not focusing on resolving only short-term problems, but also considering long-term ones.

OLIVIER BOUTRON | COORDINATOR

PROJECTS

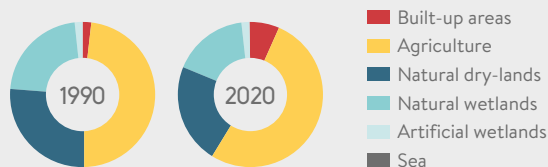
1 Understanding the spatial and temporal dynamics of wetlands

ANIS GUELMAMI | guelmami@tourduvalat.org

To better measure the impact of the rapid development of dams and reservoirs on wetland biodiversity, our team has developed a complete and exhaustive database of this infrastructure for all MedWet countries. Cross-referencing this information with data from the International Waterbird Census (IWC) has shown that these artificial ecosystems play a significant role in the distribution of diver species (contrary to waders) and that their use varies greatly according to bioclimatic zones.



Land use land cover change



Example of an image used for cartographic monitoring (here Sentinel-2 2020-03-12) and illustration of the trends observed at the pilot site of Buna / Ulcinj between 1990 and 2020 (Albania / Montenegro)

Through collaboration with Birdlife International and other Mediterranean partners, our team also contributed to the development of the Wetland Index. This index is a new tool for monitoring wetlands, combining information on habitat quality and extent, land use changes, major threats, and species population dynamics, based on a DPSIR (drivers - pressures - state - impacts - responses) approach. The first tests were carried out on 6 pilot sites in Bahia de Cadiz (Spain), Buna / Bojana (Albania / Montenegro), Camargue (France), Ghar El Melh (Tunisia), Oristano (Italy), and Ulcinj (Montenegro).

2 Informing water management

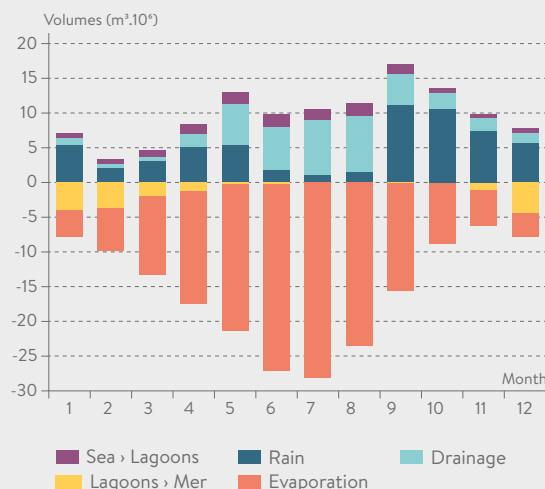
OLIVIER BOUTRON |

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2021 saw the use of modelling tools developed by our team to firstly quantify the impact of water management on the biodiversity and ecosystem services of 5 sites in the Camargue, with a focus on the impacts of the management of hydraulic structures and prospective climate scenarios, and secondly studying the vulnerability of several temporary ponds to climate change along a latitudinal gradient in Morocco. The results show that several species dependent on these areas are expected to disappear by 2100 due to the forecast decrease in hydroperiods.

In collaboration with the National Nature Protection Society (SNPN), an analysis of the hydro-saline dynamics of the Vaccarès Lagoon was carried out over the last two decades. We have quantified the specific contributions of atmospheric exchanges, contributions from agricultural catchment areas, and from exchanges with the sea, which are of primary importance for the management of the site, to the hydrological balance of this system.

The European REST-COAST project was started in 2021. This four-and-a-half-year project will study the present and future consequences for the Rhône Delta of its reconnection with the sea in the southern part of the Étangs et Marais des Salins de Camargue (EMSC).




Average total volumes exchanged each month between the Vaccarès Lagoon system and (i) the sea, at the Fourcade connection ("Lagoons > Sea" and "Sea > Lagoons"); (ii) the atmosphere ("Evaporation" and "Rain"); and (iii) the Fumemorte agricultural catchment ("Drainage"). Averages calculated over the period 1999-2007, during which all data sources were available.

How earth observation tools contribute to inventories and cartographic monitoring of Mediterranean wetlands

In order to better characterise the health status of Mediterranean wetlands and the changes they are undergoing on large spatial and temporal scales, and thus to be able to target the most appropriate conservation and restoration measures, it is often crucial to have a good inventory that provides information on their location, limits, types of habitats, main ecosystem services, and the threats facing them. National wetland inventories have always been considered by the Ramsar Convention as a key tool upon which national policies for the wise use of wetlands can be based. The lack of reliable data and information on a country's wetlands is one of the major obstacles hindering the implementation of effective conservation, enhancement, and restoration measures.

Data from Earth Observation (EO) technologies offer the potential to meet these monitoring needs in an accurate, comprehensive, harmonised, and cost-effective manner. For more than ten years, the Tour du Valat has been developing veritable expertise in this area, which it now provides to its various institutional and civil society partners in 27 MedWet Initiative countries. Our expertise is essentially the result of the ESA GlobWetland-II (2010-2014) and Horizon-2020 Satellite-based Wetlands Observation Service (2015-2019) projects, in which our team participated actively.



Moghrar and Tiout oasis, photo from the Atlas of Algerian wetlands
© Karim Bouchetata

It is essentially based on innovative approaches for mapping the extent of wetland habitats, monitoring their spatial dynamics, and quantifying the main urban and agricultural pressures facing them. Moreover, with these new methods, the cartographic information provided can also be used to directly inform certain indicators linked to Ramsar reporting obligations, or even to Sustainable Development Goals (SDGs), such as indicator 6.6.1 “Change in the extent of water-related ecosystems over time”.

It is in this context that our “Spatial and Temporal Dynamics of Wetlands” team provided support in 2021 to partners in Algeria and Tunisia, supporting the implementation of two projects aimed at improving knowledge for better wetlands monitoring in these two countries.

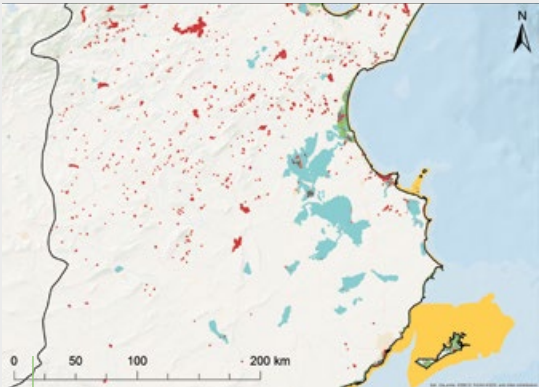
— **A NEW ATLAS OF THE 50 RAMSAR SITES IN ALGERIA**

These sites, which feature considerable variability with wadis, wet meadows, riparian forests, freshwater lakes, peat bogs, coastal lagoons, marshes, chotts, sebkhas, and the waterholes of the arid confines of the Sahara, are home to some of the richest biodiversity in the territory. Our team used dense time series from Sentinel-2A and 2B satellites, covering the year 2018, to map land occupation and use on these sites and to extract a certain number of indicators on the environments that compose them. These results show that more than 50% of the total area of the 50 Ramsar sites mapped is covered by dry natural habitats (e.g., forests, shrub / herbaceous vegetation, dry grasslands, sparse vegetation, sand and dunes). Natural wetlands account for only a third of the total area.

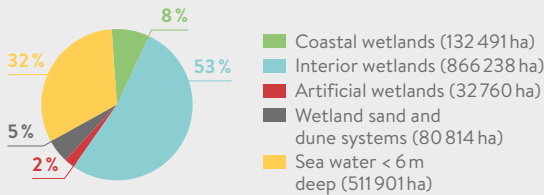
— **A NEW INVENTORY OF TUNISIAN WETLANDS**

The Tour du Valat, through its Mediterranean Wetlands Observatory, provided support to Tunisian authorities in 2021, in the framework of defining and implementing a National Wetlands Strategy. Based mainly on EO tools, a new complete and exhaustive inventory of these ecosystems has been completed, throughout the entire national territory. This inventory integrates, as much as possible, the methodological standards defined by the Ramsar Convention and thus greatly facilitates national reporting on these environments, including for SDG indicator 6.6.1. In addition, the data collected should make it possible to better locate, delimit, and characterise Tunisian wetlands, and therefore to establish a reference state for future conservation, enhancement, and restoration programmes.

Ramsar categories (national statistics)



Cartographic inventory of wetlands in Tunisia (2020), using Sentinel-2 images



PROJECT LEADER

Anis Guelmami

TEAM

Imen Rais (WWF-North Africa) and Hela Guidara-Salman (General Direction of Forest)

PARTNERS

Technical: WWF-North Africa, General Direction of Forest

Financial: TotalEnergies corporate Foundation



Flamingos in the wetlands
below the city of Tunis, Tunisia
© Hugo Ferreira

Science-Society Interfaces

Mediterranean wetlands are continuing to degrade rapidly. The forecasts are alarming, particularly for coastal wetlands, which are facing a combination of anthropogenic pressures and rising sea levels. Various local and regional stakeholders are mobilised in the Mediterranean Basin to find responses to these negative trends. The Tour du Valat has played a leading role in creating and facilitating several international, national, and local networks in recent years, uniting a wide range of stakeholders in the common objective of making society adopt practices that are more respectful of Mediterranean wetland ecosystems and their biodiversity.

The anthropogenic pressures that directly degrade Mediterranean wetlands such as soil artificialisation, intensification of agriculture, pollution, overexploitation of water resources, and global warming are partly due to poor governance. Decision-makers who are ill-informed and sometimes unconvinced of the importance of wetlands cannot take the decisions that would guarantee the sustainability of these ecosystems. Our theme group includes several science-society interfaces of which the mission is to inform, advise, and raise awareness of key wetland stakeholders such as decision-makers, civil society, site managers, and inhabitants.

THOMAS GALEWSKI | COORDINATOR

PROJECTS

1 The Mediterranean Wetlands Observatory (MWO)

THOMAS GALEWSKI |
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The MWO develops and synthesizes knowledge on the status and trends of wetlands in Mediterranean countries to inform and provide scientific advice on their governance and management. In 2021, we published a major report – the “Living Mediterranean Report” – on the status and trends of biodiversity in all ecosystems in the Mediterranean Basin, as well as a study on the adaptation of the network of protected areas in the Mediterranean Basin to global changes (see focus p.32).

2 The National Biodiversity Observatory (NBO)

CHRISTIAN PERENNOU |
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Within the framework of the NBO led by the French Biodiversity Agency, the Tour du Valat relaunched the “Wetlands” thematic meeting (RT-MH) and contributed to the development of new indicators that will help to better monitor the condition of wetlands and their biodiversity in France.

3 The Mediterranean Waterbird Network (MWN)

LAURA DAMI | dami@tourduvalat.org

The MWN was created in 2013 to improve and strengthen knowledge on wintering migratory waterbirds, focusing on building the capacity of organisations in charge of monitoring them in the Mediterranean. Initially focusing on North African countries, the network has expanded to other Mediterranean countries, and today it includes 14 partner countries.

In 2021, the MWN published:

- a scientific paper on trend analysis of 16 waterbird species in North Africa which experiments with a new method of analysis;
- 10 national technical reports on census trends and a synthetic report;
- in partnership with the MWO, a scientific paper highlighting wetlands of international importance for wintering waterbirds in the Mediterranean that were not yet covered by the RAMSAR site network.

4 The 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 region, specifically in national and regional policies. It brings together 27 NGOs and research centres from 15 countries. Its 2021 activities included activating the “Red Alert” warning, which enabled it to advocate in favour of the Erimitis wetland on the island of Corfu (Greece), which is directly threatened by a tourism project.



The Erimitis wetland was supported by the Mediterranean Wetlands Alliance

The training cycle for 12 Mediterranean NGOs undertaken in 2019 was completed, while several conservation micro-projects continued and some were finished, such as the actions carried out in favour of the Oualidia Ecological Information Centre in Morocco.

5 Mediterranean Lagoons Transfer Unit consortium

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The Tour du Valat has been managing one of the five Lagoons Transfer Units since 2001, in partnership with the Occitanie Nature Area Conservancy and the Corsican Environmental Office. This stakeholder support system aims to promote the preservation and restoration of lagoons and their peripheral wetlands in the French Mediterranean. The key role of the Lagoons Transfer Unit within national policy has been confirmed by the French Ministry of the Environment and the French Biodiversity Agency, with a five-year charter renewed in 2021.

Adapting the protected area network to global changes: the case of wintering waterbird communities in Mediterranean wetlands

MEDITERRANEAN WETLANDS, IMPORTANT ECOSYSTEMS THAT ARE THREATENED

The Mediterranean Basin is subject to significant anthropogenic pressures that threaten the exceptional biodiversity it hosts. Wetlands, which are among the most endangered ecosystems in the region, are particularly threatened by urban sprawl, agriculture, climate change, and the creation of hydraulic infrastructure. Because Mediterranean wetlands are not only threatened, but also play an essential role in the life cycle of many species such as waterbirds, and because they provide multiple services to our societies and play a key role in the fight against climate change, it is crucial to preserve them. They have also been identified as priority areas for protection by European Union countries in the new post-2020 framework for the protection of biological diversity, which should set a target for protected areas of 30% in 2030, a figure that is currently below 17%.

A flock of Marbled Teal
© Thomas Galewski





Dunlin (*Calidris alpina*), one of the species monitored in the International Waterbird Census for which many internationally important wetlands have not yet received official recognition
© Thomas Galewski

PROTECTED AREAS

While these new and extremely ambitious targets are a great opportunity to create many new protected areas, their effectiveness in conserving biodiversity depends on parameters that are crucial, but all too often overlooked in the protected area designation process. First, protection must focus on sites of importance for biodiversity, even if they are in the heart of areas with high economic value. In the past, however, designation has tended to favour regions of limited accessibility and economic interest. As the effectiveness of protected areas lies in reducing human pressures and mitigating their effects, it is also crucial to anticipate future threats in order to designate as protected areas those wetlands that will potentially be strongly impacted by global change.

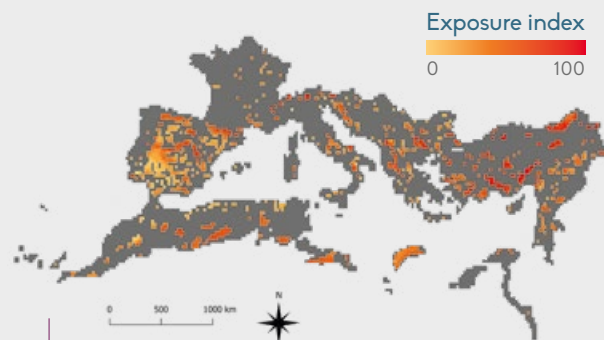
GUIDING THE DESIGNATION OF NEW PROTECTED AREAS

Fabien Verniest's doctoral research at the Ecology and Conservation Sciences Center (National Natural History Museum), in collaboration with the Tour du Valat, aims to identify sites that are important for biodiversity and vulnerable to future anthropogenic pressures. This identification, based on data from the International Waterbird Census (IWC) and future projections on climate and land use according to different scenarios for the end of the 21st century, concerns in particular:

- key biodiversity areas that are both unprotected and highly exposed to future climate and land use changes;
- wetlands of international importance for waterbirds but that have no protection status;
- wetlands whose wintering waterbird communities are vulnerable to future sea-level rise;
- wetlands whose wintering waterbird communities will potentially have difficulty adjusting to new temperature conditions.

These different lines of research should help inform the designation of new protected areas in the Mediterranean and more specifically in wetlands.

The initial results of the thesis have already highlighted the urgent need to designate new protected areas in key biodiversity areas of the Near East and Maghreb countries for all future scenarios studied. Finally, we identified more than 150 sites of international importance for waterbirds whose status has not been recognised and more than two thirds of which are not covered by a protected area.



Exposure of key biodiversity areas to future climate and land use changes according to the most pessimistic scenario (SSP5-8.5). In addition to not being well protected, the sites in Turkey, are also highly exposed

PROJECT LEADER

Fabien Verniest (PhD student), Thomas Galewski (co-supervisor)

TEAM

Raquel Ambrosio, Olivier Boutron, Laura Dami, Anis Guelmami, Emilie Luna-Laurent, Marie Suet and Loïc Willm

PARTNERS

Technical: Wetlands International, Mediterranean Waterbird Network

Scientific: National Natural History Museum

Financial: Brittany Region, TotalEnergies corporate Foundation, Ministry of the Ecological Transition



© Hervé Hôte / Agence Caméleon

FABIEN VERNIEST

Doctoral student

“Like many of the waterbird species I study, every year I winter at the Tour du Valat where I benefit from an ideal working climate for predicting the impact of global changes on the avifauna of Mediterranean wetlands”

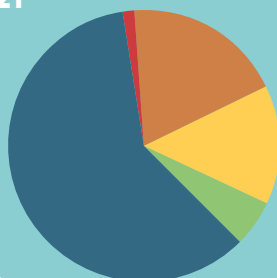
OUR ACHIEVEMENTS

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 2021

We published a wide range of articles in international journals, with 44 publications by the end of 2021.

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	44
PHD	1
BOOKS / CHAPTERS IN BOOK	14
STUDENTS REPORTS	10
TECHNICAL DOCUMENTS	4



Find all our publications by scanning 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:

- 8,800 publications and theses;
- 490 different periodicals of which 71 are running;
- 46,745 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 on-line reader account to benefit from a range of custom used services: saving of research results, and the possibility to create alerts or to generate an RSS flow...

INFORMATIONS

The Resource Centre is open to everyone, from Monday to Friday 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
Document portal: tourduvalat.centredoc.fr

CONVEYING & CONVINCING

In addition to our numerous scientific publications and technical reports, we carry out numerous transfer and advocacy activities each year. Activities that are essential to our mission “To ensure the conservation and wise use of Mediterranean wetlands by improving the understanding of their functioning and by mobilising a community of stakeholders”.

— CONVEYING AND EXCHANGING

In the greater Mediterranean region, we offer training courses within the framework of the Mediterranean Waterbird Network (MWN), the Mediterranean Wetlands Alliance, and the project “Civil society, NGOs, and wetlands” financed by the French Development Agency (AFD) and the French Facility for Global Environment (FFEM).

Within the framework of MWN activities, ten national technical reports on the evolution of bird censuses and a general synthesis report were produced in 2021.

Find the synthesis online:

<https://tourduvalat.org/en/download/33368/>

Experience-sharing day of the Eurasian Spoonbill International Expert Group

This group, whose chairman is Jocelyn Champagnon, a research scientist at the Tour du Valat, oversees the

Preparing training modules, producing videos, publishing brochures and reports, relaying awareness-raising campaigns, participating in television and print media reports, organising events, conferences, seminars, and webinars: these are all ways of reaching our various targets – nature managers, academics, elected officials, as well as schoolchildren and the general public.

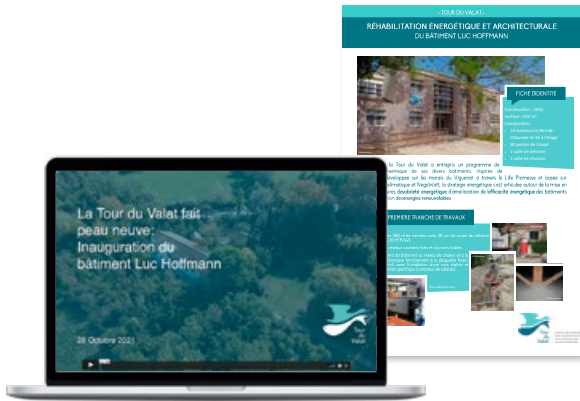


international action plan for the protection of this emblematic wetland species.

As part of the European Life Marha project, the Mediterranean Lagoons Transfer Unit organised several training courses for Natura 2000 managers and coordinators on the identification of “Macrophytes” (Arasu lagoon in Corsica and saltworks of Villeneuve-lès-Maguelone , Hérault).

© Marie Garrido / OEC





A video and an explanatory brochure were produced to document **the exemplary energy renovation of the Luc Hoffmann building**.

Link to video: <https://vimeo.com/654868319>

— CONVINC

IUCN WORLD CONSERVATION CONGRESS



The Tour du Valat was very active at the World Conservation Congress in Marseille (September 2021). As a member of the IUCN, and with Jean Jalbert vice-president of the French Committee, it took part in the formal discussions and votes of the Assembly and also submitted, with some twenty “co-sponsors”, a motion on the implementation of Nature-based Solutions (NbS) in the Mediterranean Basin. The Tour du Valat was also very present through numerous presentations and discussions on NbS, support for civil society through the Mediterranean Wetlands Alliance, the stepping up of the Mediterranean Biodiversity Consortium, the publication of the “Living Mediterranean Report”, and how to better mobilise key stakeholders such as politicians and business leaders.

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

Living Mediterranean Report

Thanks to the meticulous work carried out by a Tour du Valat team, the Living Mediterranean Report presents the most complete synthesis ever made on the evolution of the biodiversity of Mediterranean vertebrates since 1993. This report has received excellent media coverage.



Improving the response of elected officials and nature managers to climate change

The Mediterranean Lagoons Transfer Unit, coordinated by the Tour du Valat and the Lez Territorial Public Establishment, has facilitated several concertation workshops between elected representatives and members of the local water commission (CLE) in the area around the Palavasian lagoons. The momentum has been set in motion and a new “climate change” commission created!

Taking action for Mediterranean wetlands



The Mediterranean Wetlands Alliance has activated its “Red Alert” mechanism and relayed the mobilisation of civil society organisations encouraging the Greek Prime Minister to act to prevent the destruction of Corfu’s Erimitis peninsula and its wetlands by a future tourist resort.

www.medallianceforwetlands.org

— CONFERENCES AND SEMINARS

We regularly organise symposia, conferences, webinars, and seminars for which we welcome scientists who are mainly working on the conservation of Mediterranean wetlands.

In 2021 our annual conference on the theme of conservation biology, initiated to pay tribute to the work of Heinz Hafner for the conservation of waterbirds and wetlands, was given by Ana Rodriguez, research director at the CEFE-CNRS Montpellier and member of the Tour du Valat Science Council. It was entitled “Measuring the difference that conservation makes”.

MEDIAS

In 2021, our activities were covered in 435 media reports, 12 television reports, 12 radio programs, 350 articles in the French press, and 61 website articles. The publication of the Living Mediterranean Report was one of the most widely covered stories. It was the subject of a extensively transmitted AFP dispatch (to 163 media). Two of the most highly showcased topics were the creation of the Mediterranean Biodiversity Consortium at the IUCN World Conservation Congress in Marseille and the inclusion of the Tour du Valat Estate in the IUCN's green list of protected and conserved areas.

Due to the health situation, few events were organised by the Tour du Valat in 2021, leaving little opportunity for press coverage.

LA TOUR DU VALAT 2.0

The number of Facebook, Twitter, and LinkedIn followers has been constantly growing.

At the end of 2021, the Tour du Valat Facebook page had 3,690 followers (+523 followers), while we had 1,869 followers on Twitter (+293 followers). The LinkedIn page counted 2,215 followers (+860 followers).

On average, our Facebook posts are viewed by nearly 736 users, and register 40 interactions (sharing and likes). On Twitter, we have an average of 632 views and 12 interactions (retweets and comments) per publication. More than 110 videos are online on our Vimeo account, with more than 6,800 views in 2021. Finally, on LinkedIn, our publications were seen on average by 435 users with 27 interactions.

2021 IN NUMBERS

 **3,690** FOLLOWERS | **411** PUBLICATIONS | **302,418** VIEWS | **16,290** ENGAGED USERS

 **1,869** FOLLOWERS | **337** TWEETS | **213,100** VIEWS | **3,992** ENGAGED USERS

 **2,215** FOLLOWERS | **288** PUBLICATIONS | **125,331** VIEWS

At the local level, the Greater Flamingo is still the star via reports on its courtship display, our flamingo ringing events, and “Adopt a Flamingo” program! Our agro-ecological project on the Petit Saint-Jean Estate was also described in several articles, when we installed shelters for bats that will help control grape worms in the vines. A few articles also conveyed our positions on the Arles motorway bypass project.

Concerning our other scientific activities, several articles were published on the impact of lead on birds, the link between antibiotic resistance and the environment, and mosquito control.

MOST POPULAR AND SHARED PUBLICATIONS ON SOCIAL MEDIA

- Campaigns for special events (World Wetlands Day, World Biodiversity Day, World Migratory Bird Day)
- Tour du Valat projects and activities (monitoring, research, day-to-day life on the Regional Reserve, scientific projects)
- Publication of the “Living Mediterranean Report”
- Greater Flamingo ringing in August
- Information relayed by our partners and by the media
- Ads for jobs, internships, and civic service positions



© Hervé Hôte / Agence Caméleon

A RENOWNED CANTEN TEAM!

Corinne Tayolle, Barbara Comabella, Arnaud Charbonnier and Stéphanie Gouvernet

“During the Covid period, we had to adapt, stop serving at the table and provide a buffet... But we didn’t lose our aficionados! Employees and guests are once again enjoying themselves at the Tour du Valat canteen... And we are enjoying cooking for and serving them!”



© Hervé Hôte / Agence Caméleon

YANNIS DJOULDEM SANCHO, CHLOÉ SUARD, KLERVI VERBRUGGHE
(CIVIC SERVICE) **AND CAROLINA HADDEN** (EUROPEAN VOLUNTEER)

“We all come from different backgrounds, but we are all highly motivated to do something for the environment! Here we have the chance to work alongside extremely qualified people in different sectors, which enables us to develop our professional knowledge and skills.”

— 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 supra-governmental 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

- European Union
- CEPF- Critical Ecosystem Partnership Fund
- AFD - French Development Agency
- FFEM - The French Facility for Global Environment
- FAO - Food and Agriculture Organisation

NATIONAL PARTNERS IN FRANCE

- Ecological Transition Ministry
- Ministry of Agriculture and Food
- Rhone Mediterranean and Corsica Water Agency
- OFB - French Biodiversity Agency
- ANRT – Association Nationale Recherche Technologie
- CNRS - French National Research Centre

TERRITORIAL PARTNERS

- South Region Provence-Alpes-Côte d'Azur
- Bouches-du-Rhône Departmental Council
- Camargue Regional Nature Park
- National Society for the Protection of Nature

BUDGET & GOVERNANCE

The budget for the year 2021 amounts to 5,734,000 €

EXPENDITURE

2,923,000 € euros have been allocated to the scientific programmes, including 634,000 € for the “Species Conservation” theme, 148,500 € for the “EcoHealth” theme, 747,000 € for the “management and restoration of Natural and Agricultural ecosystems”, 409,000 € for the “Wetland Dynamics and Water management”, 702,500 € for the “Science-Society Interfaces”, and 282,000 € for shared scientific activities (scientific management, conferences, training, transfer, project development, etc.).

826,000 € have been allocated to the management of the estates (Tour du Valat and Petit Saint-Jean).

307,000 € have been allocated to general management (including the governance of the organization as well as the representation of the Tour du Valat in major forums) and to communication (website, annual report, etc.).

110,000 € have been allocated to managing the Tour du Valat library, principally the purchase of books and scientific journals.

1,568,000 € have been allocated to ancillary services, which include financial and administrative services, the canteen, building maintenance, and the repairs workshop.

EXPENDITURES IN EUROS

• Scientific programmes	2,923,000 €
• Estates management	826,000 €
• General management / Communication	307,000 €
• Building rehabilitation Tour du Valat & Petit Saint-Jean	110,000 €
• Ancillary services (administration, library, maintenance, canteen...)	1,568,000 €
TOTAL	5,734,000 €

RECEIPTS IN EUROS

• Core funds	670,000 €
• Agreements with private organizations	3,200,000 €
• Agreements with public organizations	1,400,000 €
• Revenues from the Estate	261,000 €
• Various revenue (canteen, accommodation...)	203,000 €
TOTAL	5,734,000 €

TOUR DU VALAT RECEIVES ITS FINANCING FROM A NUMBER OF SOURCES

- 49% of its receipts come from the MAVVA Foundation (2,800,000 €)
- 24% of its receipts come from partnership agreements with public organizations (1,400,000 €)
- 12% of its receipts come from its own funds, held by the Pro Valat Foundation (670,000 €)
- 9% of its receipts are revenues from the estate, canteen, accommodation (464,000 €)
- 7% of its receipts come from partnership agreements with other private organizations (400,000 €)

— BOARD

COLLEGE OF FOUNDERS

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

COLLEGE OF EX OFFICIO MEMBERS

- **Fabienne Ellul**
Sub-prefect of Arles, representing the French Home Office
- **Marc Savasta**
Regional representative for Research and Technology, representing the French Ministry for Higher Education and Research
- **Corinne Tourasse**
Regional Directorate for Environment, Planning and Housing, representing the French Ministry of the Environment
- **Patrick de Carolis**
Mayor of Arles, representing the Town Council of Arles

COLLEGE OF EXPERTS

- **Dr. Gordana Beltram**
Ministry of the Environment and spatial Planning (Slovenia)
- **Dr. Claire Papazoglou**
Associate Secretary, Consultant in European policies for NGOs (Cyprus)
- **Antonio Troya**
Treasurer, Director of the International Union for the Conservation of Nature - Center for Mediterranean Cooperation (IUCN Med - Malaga, Spain)
- **Dr. Tobias Salathé**
Secretary, Ramsar Senior Advisor for Europ (Gland, Switzerland)
- **Thymio Papayannis**
Honorary member, MedWet senior adviser, President of MedINA (Greece)

— SCIENCE COUNCIL

- **Dr. Patrick Duncan**
President, Research director CNRS (French National Centre for Scientific Research), Laboratory of Chizé (retired), France
- **Prof. Debbie Pain**
Vice-president, Honorary Professor, School of Biological Sciences, University of East Anglia; Honorary Research Fellow, University of Cambridge, United Kingdom
- **Prof. Wolfgang Cramer**
Research Director (CNRS), Professor of Global Ecology, Mediterranean Institute for marine and terrestrial biodiversity and ecology (IMBE), France
- **Prof. Nick Davidson**
Nick Davidson Environmental, United Kingdom & Institute for Land, Water & Society, Charles Sturt University, Australia
- **Prof. Phoebe Koundouri**
Athens University of Economics and Business; President-elect European Association of Environmental and Resource Economists; Director EIT Climate KIC Greece; Co-Chair United Nations SDSN, Greece
- **Dr. Yann Laurans**
Head of the Land Biodiversity Team WWF France, France
- **Dr. Ana Rodrigues**
Research Director, CEFE / CNRS Montpellier, France
- **Prof. Timothy Swanson**
Professor of Economics, Centre for International Environmental Studies, Switzerland
- **Dr. Ruth Cromie**
Chair of Technical Committee for UNEP-Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA), United Kingdom
- **Prof. Elena Kazakou**
Professor of Comparative Ecology of Organisms, Communities and Ecosystems, Montpellier SupAgro, France

OUR PRIVATE PARTNERS & SPONSORS



The MAVA Foundation was created by Luc Hoffmann in 1994, with the mission of establishing solid partnerships so as to preserve biodiversity for future generations. The Tour du Valat is one of the key projects backed by the MAVA Foundation, from which it receives major support.



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.



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.



In early 2017, the Axiome endowment fund signed a 5-year sponsorship agreement to support the Mediterranean Lagoons Transfer Unit's awareness-raising missions, particularly those linked to World Wetlands Day and European Heritage Days.



The CEPAC (bank) will continue to support our projects by funding an electric vehicle, and sponsoring the creation of agroforestry plots on the Petit Saint-Jean Estate, and an alternative mosquito control project that uses no insecticides.



The foundation supports useful initiatives in the field of collective solidarity, knowledge sharing, and promotes terroirs and built - or natural heritage. It chose to support the creation of a web platform dedicated to our Tour du Valat flamingo sponsorship program which enables us to raise public awareness and contributes to the preservation of biodiversity in Mediterranean wetlands.



The Fondation de France supports two multi-disciplinary research projects at the Tour du Valat. One is to develop a participative geographical information system for the Greater Flamingo that encourages a social and human approach to science. The second project, which focuses on agricultural production systems, seeks to develop a showcase site for agroecology on the Petit Saint-Jean Estate in the western Camargue.



The Heritage Foundation supports an agroforestry and agroecology project on the Petit Saint-Jean Estate. This project aims to develop a showcase site for permaculture, with the planting of berry hedges and the creation of ponds. Its overall goal is to create a model for tomorrow's farms.



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 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.



In the framework of our development of a showcase site for permaculture on the Petit Saint-Jean Estate, which focuses on agroforestry and agroecology projects, the François Lemarchand Foundation is providing support for overhauling the irrigation network and developing niche crops.



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.



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.



We are partners in a hydraulic and ecological restoration project on an agricultural wasteland belonging to the maritime port of Marseille, intended to favour hunting and grazing activities while preserving Mediterranean biodiversity. This project is co-financed by the ERDF and the Rhone-Mediterranean and Corsica Water Agency.



The public works group NGE has worked with the Tour du Valat Foundation on a project for controlling invasive alien species, and to fund a research PhD on how to prevent the encroachment or re-encroachment of these species after habitat disturbance.



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.



Continuing our partnership initiated twelve years ago, TotalEnergies corporate Foundation provided support for our Greater Flamingo research programme. It also supported our monitoring of the Slender-Billed Gull, a modelling project on the site of the former saltworks in the Camargue, the monitoring of biodiversity in marshes, as well as the Mediterranean Wetlands Observatory.



In the framework of an international partnership, WWF is working with Coca-Cola in its "Replenish" programme. The aim is to give back to nature and communities the same amount of water as that used for the worldwide production of its drinks. In France, this commitment has resulted in a sponsorship agreement between Coca-Cola and WWF-France for a project aiming to improve the hydrological and biological exchanges in the lagoons and marshes on the former Camargue saltworks site.

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.



There's the perfect flamingo for every taste and budget! Nearly 2,500 sponsors have joined the adventure by adopting a flamingo. 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

— 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](tel:0490972013) / ackermann@tourduvalat.org

WE NEED YOU!

To support our work and learn more about our different activities, you can visit our online payment platforms:
<https://tourduvalat.org/en/support-us/faire-un-don/>
and www.monflamant.com

— ADOPT A FLAMINGO

Are you as fascinated as us by this wonderful bird and interested in contributing to the protection of this species?

The Tour du Valat invites you to “adopt a flamingo”. An original and fun way to learn more about this mysterious bird. It is also a wonderful 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.

— VISITING US

THE TOUR DU VALAT IS OPEN TO THE GENERAL PUBLIC ON SEVERAL OCCASIONS EACH YEAR:

- On World Wetlands Day, usually the first Sunday in February, Tour du Valat has an open house, with conferences, video presentations and guided tours of the Estate.
- Together with the Bureau des Guides Naturalistes (BGN), paying guided visits are organized from November till April, every second Saturday. Registration is compulsory at BGN Bureau (+33 (0)6 95 90 70 48)
- If you wish to receive information about the programmes and other events organized at the Tour du Valat for the general public, please contact us at: secretariat@tourduvalat.org



WWW.TOURDUVALAT.ORG



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