ACTIVITY
REPORT 2017

TOUR DU VALAT

Tour du Valat

Research institute for the conservation of Mediterranean wetlands

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ACTIVITY REPORT 2017

TOUR DU VALAT

Editorial

Extreme climate events, failure to adapt to or mitigate climate change, loss of biodiversity and collapse of ecosystems, natural catastrophes and environmental damage caused by human activity.

These risks are among the Top 10 global risks defined by a broad-based panel of global opinion leaders from the economics sector. The Global Risks Report 2018, presented at the World Economic Forum in Davos, is a faithful image of the perception of several hundred of the major players in the world economy concerning the potential impact and probability of technological, economic, societal, geopolitical, and environmental risks. For the first time, six of the ten risks are environmental, whereas none of the six had been mentioned before 2010.

These changing perceptions certainly reflect the degradation of the environment, which is becoming increasingly obvious and serious every year. But they also express the growing awareness of these issues, which is a very encouraging sign. Since risk management is a key parameter in managing a business, we can hope economic stakeholders will take strong action to decrease these risks, and in particular, embrace the consideration that nature is an essential natural capital that must be managed very carefully.

Today, however, 90% of natural catastrophes are linked to water, and the cost of floods is likely to increase 400% by 2050. Given these risks, the restoration and sustainable management of wetlands is a pertinent and affordable response. It is a nature-based solution to respond to societal challenges, through which these long under-appreciated natural areas can play a major role in “mitigating climate change”.

Nonetheless, while increased awareness can result from a better understanding of the risks, major progress is still required for society as a whole to be mobilised and respond to the challenges of the 21st century.

Whereas slavery was the norm in numerous societies throughout the ages, it only took a few decades to abolish slavery in most countries, based on moral considerations.

Is it morally acceptable today for a single species, which has self-proclaimed itself “wise”, Homo sapiens, to consider all living organisms and non-living matter as resources intended for its use, while eliminating all the species that might upset its plans?

The necessary reconciliation of People and Nature, of People as part of Nature, is one of the major challenges facing our postmodern societies.

This aim is also what drives the Tour du Valat’s actions, which are modest compared to the challenges, but determined. Understand, manage, transmit, and convince: these four verbs sum up our commitment.

We invite you to discover in the following pages our wide range of actions and the partnerships we have developed so that wetlands, the most productive ecosystems on the planet, so necessary for the well-being and security of everyone, remain niches of thriving biodiversity for all human beings to enjoy.

André Hoffmann
PRESIDENT

Jean Jalbert
DIRECTOR GENERAL

Hugo Ferreira,
EUROPEAN VOLUNTEER

“ Experiencing the wildness of the Camargue is like realizing a childhood dream. Then how can I call it work, when I am living out my passion? ”

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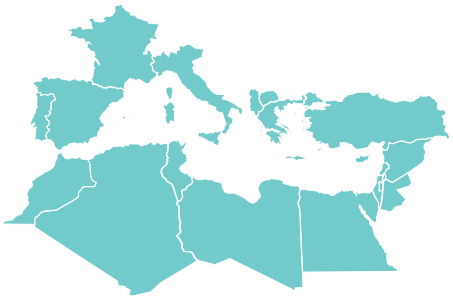
1954
FOUNDED BY LUC HOFFMANN

87
EMPLOYEES

AROUND
1 400 scientific
PAPERS PUBLISHED

90
PhD

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



CO2
LOW EMISSIONS
Thanks to local waste recovery
such as rice husk
for insulation and heating

ORGANIC
AGRICULTURE
AND AGROECOLOGY

TOUR DU VALAT

Created more than 60 years ago by Luc Hoffmann, visionary naturalist and patron, the Tour du Valat has since then 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 the natural heritage can be reconciled, Tour du Valat has for many years been developing programmes of research and integrated management that favour interchanges between wetland users and scientists, and promote wetlands benefit to decision makers.

Tour du Valat, located in the heart of the Camargue, is a private research organisation. It has the legal form of a public-benefit foundation since 1978. The estate, which includes all the natural habitats representative of the fluviolacustrine zone of the Camargue, extends over an area of 2,700 hectares, of which 1,845 are classified as a Regional Natural Reserve. Beyond its role of biodiversity conservation, it is a privileged site for conducting researches, test and develop agricultural and hunting activities compatible with the maintenance of this exceptional biodiversity.

The Tour du Valat is also a unique bibliographical resource centre in the Mediterranean, specialized in wetlands ecology. Each year, hundreds of researchers, teachers and students from the Mediterranean basin come and consult the library's reference material.

Tour du Valat employs eighty seven employees who are involved throughout the Mediterranean. The scientific team, comprising around thirty specialists, is working on programmes of research into the functioning of wetlands, and is testing out methods of management.

The results are communicated via training and the implementation of innovative projects being carried out in collaboration with a wide range of partners.

Bull ranch of the Tour du Valat © H.Hôte

The Estate

The Tour du Valat Estate extends over almost 2,700 hectares and consists of a mosaic of natural habitats characteristic of the Camargue, notably some rare and threatened habitats such as temporary pools and fossil dunes, and also wide expanses of sansouires (saline scrub). The fauna and flora are adapted to these special habitats. In July 2008, 1 845 hectares of the estate received approval as a Regional Natural Reserve.

1 - THE CONSERVATION OF THE EXCEPTIONALLY RICH NATURAL HERITAGE

To this end, a wide range of natural heritage surveys and monitoring programmes are regularly carried out: vegetation mapping, botanical surveys, water bird censuses, mammal counts, etc. The Estate team sees to it that the natural reserve regulations are adhered to and that the hydraulic infrastructure that enables 640 hectares of marsh to be kept in optimal condition for supporting biodiversity is well-maintained.

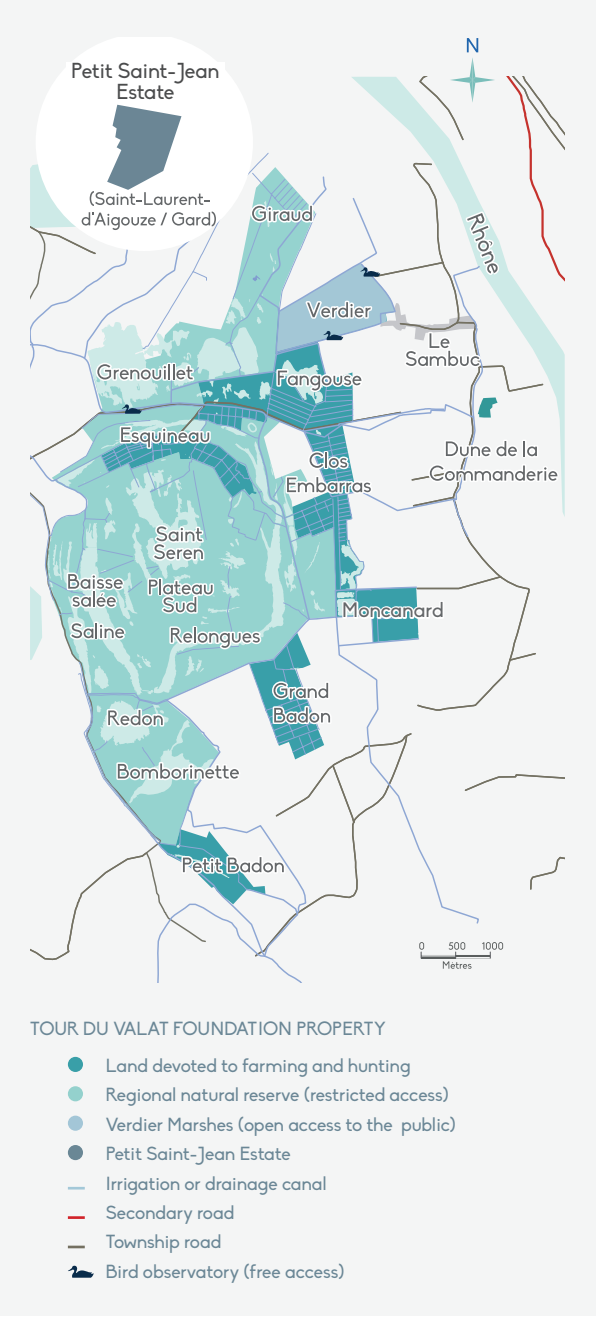
Flight of greater flamingos won the Tour du Valat
© C.Hanzen

2 - THE IMPLEMENTATION OF RESEARCH PROGRAMMES

Programmes are meant to better understand the functioning of habitats and species in relation with human activities. The aim is to learn the lessons needed to maintain biodiversity, optimise management practices, combat undesirable species, and restore degraded habitats. The results are put to use in assisting with the management of other sites, drawing up management plans, getting involved in technical networks, and signing up to economic mechanisms (Agri-Environmental Measures, Local Farming Contracts, Sustainable Farming Contracts, etc).

3 - MAINTAINING TRADITIONAL ACTIVITIES

Traditionally, the Tour du Valat's pastures have supported horses, sheep, and bulls. In 1994, Tour du Valat set up its own extensive farm with 230 cattle and 20 horses of the Camargue breed, which graze 1200 hectares of natural habitats. This farm contributes to the research programmes that are carried out by the scientific teams. The estate's farm is self-financed and environmentally friendly, and conforms to the specifications for organic farming and for the "Camargue Bulls" Appellation d'Origine Protégée (AOP). Four herdsmen (livestock farmers) turn their herds out to graze on a thousand hectares of the estate. In 2017, the livestock grazing on the site amounted to about 450 cattle and 70 horses. Other areas of land are also used for organic farming within a farming cycle that is traditional in the Camargue: rice, wheat, and hay.



Hunting is also an activity that has been carried out traditionally on the estate.

It takes place subject to innovative regulations:

- To avoid lead poisoning among ducks, traditional lead shot has been banned since 1994 in favour of tungsten or steel alternatives; detailed shooting records are kept (number of shoots and number of kills) so as to provide reliable statistical data for scientific studies.
- The Tour du Valat hunting group comprises about twenty current and retired employees of the organisation, who hunt over nearly 25% of the site.
- The Tour du Valat also takes an active part in local efforts to control the wild boar population, by organising drives (to which many hunters from the region are invited), arranging shoots to protect crops, and organising hunting by bow and arrow in the most sensitive areas (the core nature reserve).

Biodiversity on the Estate

Greylag geese on the Saint Seren marsh
© Marc Thibault

The Tour du Valat Estate is host to thousands of waterbirds. In recent years it has become a favourite wintering area for migratory birds such as Common Crane and Greylag Goose. It is also an advantageous breeding site for many waterbirds.

Réserve Naturelle Régionale
TOUR DU VALAT

IN WINTER, THE CRANES PUT ON A SHOW!

The Camargue is becoming a major wintering ground for the Common Crane, with almost 15, 000 of them spending the winter season here. These majestic birds range over the Tour du Valat's vast sansouires (saline scrub) and salt meadow, and even wheat fields. The Saint Seren marsh is regularly used as a roosting area, which makes for a magnificent sight. In January, some 2,000 cranes spent the night there. In December, more than 5,000 birds came back there at nightfall to roost.

The Tour du Valat is also an excellent site for Greylag Geese wintering in the Camargue. A new record was attained in January with the presence of 2,300 individuals. These major gatherings of geese enable us to census marked birds (having a collar) coming from either Germany or the Czech Republic and add to the species databases. Other goose species are sometimes spotted, including two Bean Geese in the early season and Greater White-fronted Geese in the autumn.

This autumn, the shallow water levels led to good numbers of waders. Flocks of as many as 900 Dunlins and Little Stints were counted on the mud flats.

BREEDING BIRDS

Last year a large colony of Ardeidae and cormorants settled in the flooded tamaris trees of La Bomborinette, with a total of 1200 pairs belonging to seven species (Great Cormorant, Grey Heron, Little Egret, Cattle Egret, Black-crowned Night Heron, Squacco Heron, and Glossy Ibis. The heronry was also used as a roosting ground in the post-nuptial period, when it attracted a species new to the Estate, the Pygmy Cormorant.

Eurasian hobby © Marc Thibault

A SUCCESS FOR EURASIAN HOBBIES AND PRATINCOLES

A first for the site, a pair of hobbies raised four young. The majority of the French population of Collared Pratincoles (35 pairs) bred in the Terres de Moncanard, in the eastern part of the Estate. It was the seventh consecutive year that the pratincoles have bred successfully, which is exceptionally rare for the species. A Black-winged Pratincole was also spotted in the colony.

INCREASINGLY INVASIVE EXOTIC SPECIES

Despite its management system and regular monitoring of the Estate, the Tour du Valat is nonetheless colonised by invasive exotic species. The Asian Hornet, for example, arrived last year. The Italian Cocklebur, Xanthium italicum Moretti, is an annual plant that is increasingly colonising the Esquineau and Relongues nord marshes. Manual clearing operations have therefore been undertaken. In spite of systematic clearing, new stations of Tree Groundsel appear every year. In 2017, 242 plants had to be pulled out. South African Ragwort was also discovered (and subsequently removed) in two places.

Bellis annua © Amelie Granger

NEW MOTH SPECIES

A moth species new to the Estate was identified, with the scientific name Idaea rhodogrammaria. The Coral-lined Wave is rarely spotted in France and is limited to the Mediterranean coast.

CRYPTIC SPECIES: NUMEROUS ALGAE IDENTIFIED

Finally, we can note that *Nitzschia frustulum, Tryblionella hungarica, Planothidium frequentissimum* and 47 other species were censused on the carapaces of the Pond Turtles in the Esquineau marsh. They are, of course, Diatoms (brown algae) identified in the framework of a partnership with Aix-Marseille University and the Mediterranean Institute of marine and terrestrial Biodiversity and Ecology (IMBE).

Orphys tenthredinifera © Amelie Granger

Idaea rhodogrammaria © O.Pineau

Patrick Grillas,
PROGRAMME DIRECTOR

© H.Hôte / Agence Caméléon

INTRODUCTION

Our programme has the following four objectives: (1) improve our understanding of the functions, values, and services provided by Mediterranean wetlands, (2) assess management practices that aim to better conserve, restore, and use them sustainably, (3) develop synergies between stakeholders, particularly through capacity building, to ensure there is a real evolution toward the sustainable management of wetlands, and (4) unite stakeholders to advocate the importance of Mediterranean wetlands vis-à-vis decision-makers.

The principal new developments in our research concern different aspects of wetlands ecology. Through the development of physical modelling, hydrology is becoming an increasingly central element in integrating various disciplines. For example, hydrodynamic models have enabled us to study how avian flu viruses can survive in lagoon ecosystems, and to combine these results with an epidemiological model. Meanwhile, for the first time ever, remote sensing tools have enabled us to measure temporal variations in the area of open water at the scale of the Mediterranean Basin, which have made it possible to approximate the area and the hydrological function of wetlands. Long-term monitoring has been improved for several species, including the Eurasian Spoonbill and the fish in the EMSC site (Etangs et marais des Salins de Camargue). Ecosystem services is also a field in which research has been very active, seeking to identify and measure these services at a broad geographical scale, based on remote sensing and biodiversity analyses. Two new PhD projects in the field of restoration ecology have received funding: one on the management of exotic plants, and the other on the role of ants in plant seed dispersal mechanisms and plant community restoration.

In terms of management, the restoration of the EMSC site represents a very significant socio-economic and biological challenge in the context of coastal erosion. Our mosquito barrier test has been extended to new sites beyond the Camargue, and it may be possible to apply it at a broad scale in the delta in the near future. Meanwhile, we continued developing our agroforestry programme on the Petit Saint Jean Estate, where we planted grape vines and trees, and conducted crop tests (European Searocket).

Support for our Mediterranean partners was further developed in the framework of projects that include training modules for NGOs in Morocco, Algeria, and Tunisia. More generally, the development of the Mediterranean Wetlands Alliance must unite civil society stakeholders engaged in the conservation and management of Mediterranean wetlands.

The Mediterranean Wetlands Observatory is one of the principal vectors for raising the awareness of stakeholders who manage wetlands and decision-makers. In order to identify the probable causes underlying the dynamics of wetlands, the Observatory is working on integrating its indicators into some analyses linking the status of wetlands to the potential causes of changes in them. In this way, layers of spatial information can be accumulated on the physical environment, biodiversity, and socio-economic indicators throughout the Mediterranean Basin. The comparative analyses of these data will be one of the important areas of research in upcoming years.

Finally, our team has been reorganised a bit: Jocelyn Champagnon and Marion Vittecoq haved chaired the Species Department during the one year absence of Arnaud Béchet. In addition, Ilse Geijzendorffer became the Head of the Observatory Department in September.

The principal technical challenges for 2018 will be to consolidate our Mediterranean partnerships, particularly within the scope of MAVA and Mediterranean Wetlands Alliance projects, to continue our current projects, and to obtain the funds needed to support them. In terms of strategy, the main challenges will be the mid-term assessment of the 2016-2020 programme, and its implications for the end of that programme and for preparing the following one. These issues will be discussed in late 2018 during the joint meeting of our Science Council and Advisory Board.

Patrick Grillas
PROGRAMME DIRECTOR

Emilie Luna-Laurent,
RESEARCH TECHNICIAN

“ Monitoring hydrological exchanges between ponds in order to better understand their functioning, with the wonderful landscapes of the Camargue for scenery and the birds singing: a rare privilege! ”

SPECIES
DEPARTMENT

Species Conservation

Anthony Olivier removing the fishing nets
© Jean E. Roché

The department's overall objective is to contribute to the conservation of animal species found in Mediterranean wetlands and assist in the management of conflicts that may occur between these species and human activities.

We aim to contribute to:

- the conservation of endangered species;
- the management of species in conflict with human activities (pests, health...);
- the management of key species for human activities (fishing and hunting, tourism...).

Our conservation objectives are based above all on scientific knowledge, either by directly conducting finalised research projects, or by transferring and applying the knowledge produced by the scientific community at large. Research in our department is focused on four main areas, which are considered to be major issues in Mediterranean wetlands today and correspond to our current capacities:

- the population dynamics of Mediterranean wetland species in response to the pressures of human activities;
- the interaction between species conservation and issues linked to public and veterinarian health;
- the interaction between Mediterranean wetland species with an unfavourable conservation status and introduced non-indigenous species;
- 5, 10 and 25 year estimates of species distribution and populations, in function of changes to landscapes, climate and their exploitation.

Arnaud Béchet resumed the coordination of the Department, which had been coordinated by Marion Vittecoq and Jocelyn Champagnon during his stay in Montréal. He also defended his research supervision accreditation (HDR). The team was backed up throughout the year by volunteers from the European Voluntary Service and French Civic Service, and numerous interns including Erasmus programme volunteers. It also received several PhD students. Benjamin Folliot, whose study field is diving ducks, and Emeline Sabourin, working on the liver fluke in bovines, continued with their work as planned. Timothée Schwartz (A Rocha) started his thesis on the efficacy of artificial structures such as nest boxes (for European Rollers) or artificial burrows (for Ocellated Lizards) used as compensatory measures for development projects.

Our understanding of the relationships between biodiversity and health also increased, with several papers published in highly rated journals (resistance to antibiotics among gulls in the Camargue) and Mark Gillingham's post-doctoral thesis on the microbiome of flamingos.

We considerably improved our database infrastructure in connection with our North African partners and developed a module for directly entering ring-reading data in the MedWaterbirds web portal https://medwaterbirds.net/

The new islet constructed in the Fangassier lagoon attracted more flamingos than in 2016 (>3000 pairs) but incursions by foxes and the Eagle Owl (Bubo bubo) led to the rapid abandonment of the site. The flamingos then settled in the salt pans of Aigues-Mortes, forming a little nursery whose chicks were nearly all ringed.

2017 featured some good breeding successes. For spoonbills, the wintering sites in the Camargue National Reserve were identified through intense resighting efforts and numerous spoonbill chicks were ringed, along with ibis chicks. An international workshop was also held in Doñana, Spain, which consolidated the Ibis project.

The Slender-billed Gull confirmed its return to the Camargue with a record number of 800 pairs, but disturbances (perhaps the Eagle Owl again and overflight by a Canadair) caused the nursery to be moved and prevented us from ringing the chicks. For the second year in a row, the Collared Pratincole nested, almost exclusively on the Tour du Valat Estate, with a very high breeding success rate. A nesting platform to encourage the Osprey to breed in the Camargue was built in the Rhône riverine woodlands, in the Bois de Tourtoulen.

Arnaud Béchet, Marion Vittecoq and Jocelyn Champagnon
DEPARTMENT COORDINATORS

© H.Hôte

The species team

LEFT TO RIGHT, TOP TO BOTTOM:

Hugo Ferreira, Pascal Contournet, Marion Vittecoq, Arnaud Bechet, Delphine Nicolas, Thomas Blanchon, Florian Leborne, Christophe Germain, Alain Sandoz and Antoine Arnaud.

MISSING:

Jocelyn Champagnon, Alain Crivelli, Laura Dami, Clémence Deschamps, Benjamin Folliot, Yves Kayser, Émeline Sabourin, Marie Suet and Timothée Schwartz.

SPECIES PROJECTS

Young Pond terrapin at breakfast
© Jean E. Roché

1 - Population dynamics in response to human activities

Arnaud Béchet / bechet@tourduvalat.org

Three main activities are being developed:

- Demographic analysis of populations and metapopulations by means of Capture-Mark-Recapture (CMR) and genetic studies (birds, fish, reptiles);
- Long-term monitoring of biodiversity in the Camargue (in particular communities of birds, fish, amphibians and reptiles);
- Development of tools for gathering, managing, analyzing, networking, and presenting data.

Numerous monitoring operations and studies were conducted on spoonbill, Slender-billed Gull, Glossy Ibis, European Roller, flamingo, turtle, and fish populations.

Spoonbill: A GPS/GSM transmitter with an accelerometer was attached to two individuals (a juvenile and an adult) to better understand the time these birds spend doing different activities during their annual cycle. Major efforts were made to monitor the marked birds during the winter in the Camargue and in North Africa, and 461 chicks were ringed.

Slender-billed Gull: Although no new ringing took place, resighting work was continued in gull colonies and an article based on Charlotte Francesiaz's dissertation was published in the journal Oecologia on the dispersion and recruitment of juveniles.

Glossy Ibis: 237 chicks were ringed, and data were integrated with those of the new international Glossy Ibis network, which was inspired by the model used for the Greater Flamingo.

European Roller: 259 chicks and 39 adults were ringed in the framework of Timothée Schwartz's doctoral dissertation, and their microbiome was sampled in the Alpilles and Roussillon. A partnership was established with the Navigable Waterways of France (VNF) to monitor the impact on rollers of cutting down plane trees along the Canal du Midi.
A booklet presenting the latest scientific findings in the long-term study on the Greater Flamingo and the recommendations for managing these birds was published in the Tour du Valat's Science and Management series.

Turtles: Our long-term monitoring was continued for the 21st consecutive year, and we participated in a study that used the epizoic diatoms (algae) on turtle carapaces as an indicator of water quality. Two Haitian students learned how to study aquatic turtles thanks to funding by the Caribaea Initiative.

Ichthyic fauna: Our field work continued on trout in Slovenia with the marking of a new population of rainbow trout in the aim of assessing the influence of a former landslide on the population in the Brinta River. Within the scope of our eel study in the Fumemorte Canal, 652 eel were marked and 194 recaptured (several of which were marked in 2007, 2008, and 2009). We continued monitoring the new connection between the sea and the Vaccarès lagoon near the Etangs et marais des salins de Camargue site. In particular, we have been targeting the recruitment of glass eel, the colonisation by juvenile marine species, and the decapod crustaceans (grey shrimp, green crab) that migrate between the sea and the lagoons.

A young Eurasian spoonbill fitted with an argos transmitter with Lina Lopez-Ricaute, Thomas Blanchon and Jocelyn Champagnon © Zeppelin

2 - Health ecology

Marion Vittecoq / vittecoq@tourduvalat.org

The aim of this project is to understand the interactions between biodiversity and the dynamics of the pathogenic agents linked to public health and veterinarian problems. Our understanding of these issues will help us to reconcile the conservation of Mediterranean wetlands with the presence and well-being of human populations and also contribute to the protection of species with an unfavourable status during epizootic periods or pollutions.Our study of bacteria in gull allowed us to describe the antibiotic resistant bacteria in circulation and their relationship to those observed in humans. Two of our scientific articles were published. The first, in Ecology and Evolution, focuses on how strains of Escherichia coli sampled in the Camargue are carried by Slender-billed Gulls and resistant to last-generation antibiotics (carbapenems). The second, in the Journal of Global Antimicrobial Resistance, highlights the resistance that is transferable to the cephalosporins found in another bacterial species, Proteus mirabilis, in the same population of Slender-billed Gulls. Our team is now acknowledged to be the national expert in antibiotic resistance in wild animals. In that capacity, Marion Vittecoq was invited to the national event co-organised by the Health, Environment, and Agricultural Ministries, which focused on the health and economic issues linked to antibiotic resistance. In addition, Marion Vittecoq co-wrote and edited a chapter on antibiotic resistance in wild animals, which explains different aspects of health ecology to the general public. Finally, through our project on the liver fluke, we have improved our knowledge of the diversity of these parasites (see focus p.24).

Antibioresistance Project - Marion Vittecoq analyzing samples in the laboratory © Zeppelin

Waterbird observation, count, and recognition -sessions in Tunisia. Mediterranean waterbird network project
© Tour du Valat

3 - Modelling and monitoring wetland biodiversity

Jocelyn Champagnon / champagnon@tourduvalat.org

Our overall objective is to effectively exploit the monitoring data concerning the population of vertebrates and the presence of pathogens so as to better understand the factors that influence their spatial and temporal distribution.

In the Camargue, our search for the relict population of Ocellated lizards on the Tour du Valat Estate using dogs trained to recognise the faeces of this species was unsuccessful. We had an article published in the journal Nature de Provence on the presence of a population of Pine Marten in the Camargue, which is very mysterious given the range of this species. We continued our aerial monitoring of the ducks that winter in the Camargue, of the breeding of Tree-nesting Herons, Collared Pratincoles and Charadriiformes within the framework of the final year of the LIFE+ ENVOLL project.

After the ninth consecutive year of removing Wels Catfish from the Fumemorte canal, we have observed the return of the other fish communities in terms of biomass and diversity, without however attaining the level of abundance observed before the introduction of these catfish.

In the Mediterranean, we continued monitoring waterbird communities in the framework of the Mediterranean Waterbird Network (MWN), which has spread to Spain, Italy, France, Greece, Macedonia, and Turkey. A booklet has been translated into English and Arabic, and will be distributed to new partners at the upcoming AEWA MOP7. We organised training for Moroccan, Tunisian, Algerian, Libyan, and Egyptian volunteers on how to make censuses and identify waterbirds. A poster was created on the monitoring of wintering waterbirds at the

Mediterranean RAMSAR sites in collaboration with most of the national coordinators of the partner countries. Synergies continued to develop with the AEWA's African Initiative TSU for the analysis of waterbird population trends and communication activities. The TSU develops its activities within the scope of the RESSOURCE project, which is co-supervised by the FAO (Food and Agriculture Organisation) and aims to evaluate hunting sustainability in Sub-Saharan Africa and the Nile valley. The ONCFS (National Office for Hunting and Wildlife) / Tour du Valat team is in charge of conducting the censuses in the field as well as managing and analysing the data from the waterbird censuses carried out in Chad, Egypt, and Sudan. The initial results of the censuses conducted in January, 2017 by the ONCFS in Chad, in one of the largest Ramsar zones in the world, revealed a significant population of Black Crowned Cranes. Three days of training were also organised with those in charge of managing data in Mali and Senegal in order to update their national databases in the aim of analysing trends there.

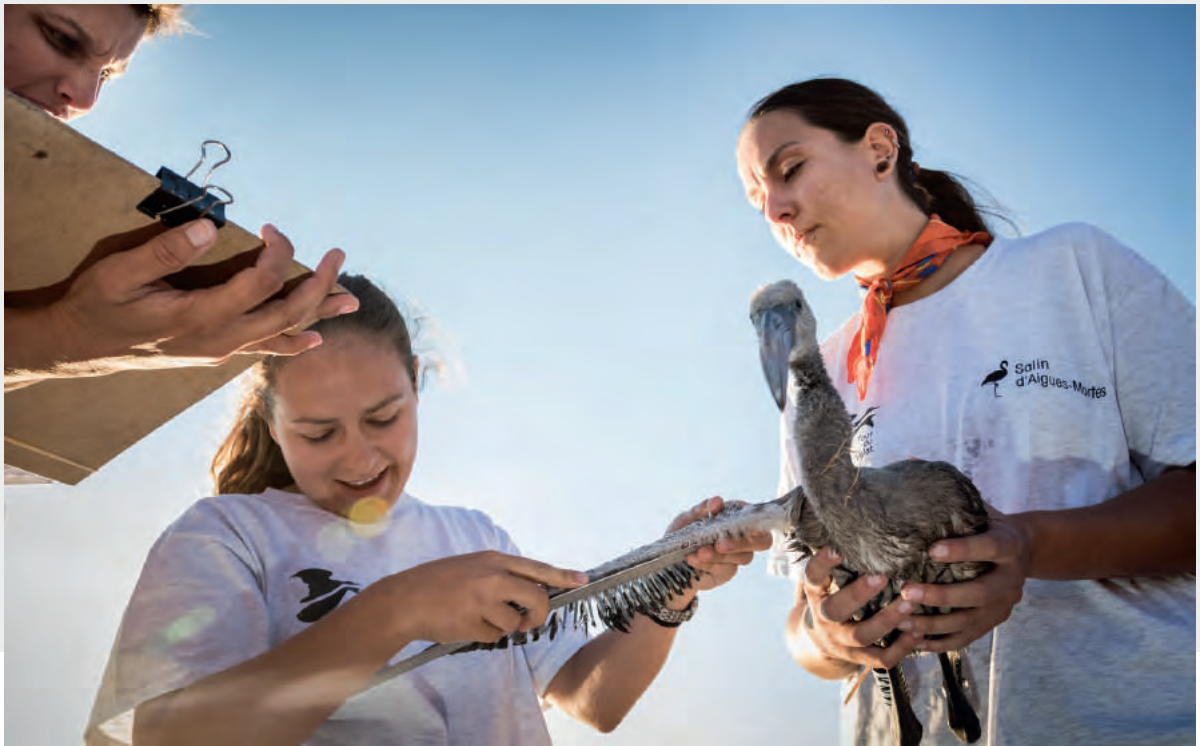
Modelling pathogenic agent dynamics. In a joint project with our Ecosystem Department, we have published in Science of the Total Environment a model for analysing the risk of an avian flu virus (AFV) being present in the Vaccarès hydrological system over time and according to different scenarios. This model simulates the arrival of an AFV that is highly pathogenic at different times and sites, and the circulation of a mildly pathogenic AFV over the entire length of the study period, in function of their different capacities to persist, as reported in laboratory data.

4 - Database

Christophe Germain / germain@tourduvalat.org

The aim in this area of work is to develop efficient infrastructure for gathering, managing, and consulting naturalistic data. Several tools are being developed within this framework.

A user's manual has been written in French and English for Medwaterbirds.net. The data management model for bird counts can now account for sites where no census is made or where birds are present but not counted. The Capture-Mark-Recapture (CMR) data management module has been developed and will be presented to our partners in Italy and Spain in the hopes they will adopt it so that the ring reading data can be better integrated for the countries that are partners in the Flamingo and Ibis networks. Our team has acquired six cell phones to gather census data using CyberTracker software.



Data collection during the ringing of flamingos with Tatiana Fuentes and Nadège Popoff
© Zeppelin

FOCUS

Fasciolosis: an unknown disease that is a major challenge

Fasciolosis is a disease caused by the *Fasciola hepatica* parasite. It is transmitted via food or water: the larvae either attach themselves to aquatic plants or remain on the surface of the water. That is why it is very common in human and animal populations. The adult parasite can infect a very large number of mammals (humans, cattle, sheep, coypu, wild boar, and lama), while in the larva phase; it can infect a wide range of freshwater molluscs (cf. figure 1).
Developing in the liver, adult worms can cause very serious digestive disorders, and in some cases cirrhosis. The treatment is costly for humans as well as livestock, and cases of resistance to drugs have been described. It is therefore a disease considered to have an impact on animal and public health in many countries.
Eating habits in France decrease the risk of transmission to humans, but the disease results in significant costs for livestock breeders. It is therefore essential to better understand this disease to better control it. To achieve that goal, we have targeted a study area where the parasite is very common and where there is good traceability for the different entities involved in the cycle (parasites, molluscs, and livestock). Emeline Sabourin has been studying the dynamics of fasciolosis on the Tour du Valat Estate within the framework of her PhD project since 2016.

The parasite in livestock and wildlife

We looked for adult parasites in our herd of bulls and wildlife (wild boar and coypu) on the Tour du Valat Estate. The rate of infection is 92% for the bulls (140), 31% for coypu (53), and 3% for wild boar (110) (cf. figure 2). The very high rate of infection of our bulls compared to other herds may be explained by the fact that they are not given any anthelmintic drugs (antiparasite drugs that eliminate parasitic worm infections), and that our herd is raised on the open range. Our cattle are therefore exposed to the risk of infection all year. However, no impact has been observed on the health of the herd. Since the purebred Camargue cattle has “evolved” with the parasite, it seems to be tolerant to it, contrary to other breeds, which seem to be much more adversely affected (with for example a drop in productivity and a higher mortality rate of calves for some dairy cows).
According to our genetic analyses of liver flukes in cattle, the genetic diversity of parasites is very broad, which would seem to indicate that there is a general presence; that is that our bulls seem to get infected several times during their lives in several different places, which creates an exchange of parasites between the different zones. There is less diversity among the liver fluke parasites in coypu. It is possible to find the same identical parasites in one individual and in different individuals. This finding may be explained by the fact that coypus rarely go more than 100 meters from their burrows. Individuals from the same burrow would seem to get infected in the same place, contrary to the cattle.

Emeline Sabourin carrying out a series of samplings on the Tour du Valat estate

Lymnaea trunculata,
a freshwater snail sampled on the Tour du Valat Estate

The role played by freshwater snails in the parasite's lifecycle

Galba truncatula, also known as *Lymnaea trunculata*, freshwater snails known to transmit this parasite in other parts of France were regularly sampled on the Tour du Valat Estate in the spring and autumn from 2015 to 2017 (cf. Figure 2). Only seven of more than 1500 water snails dissected in two years harboured parasites. This low number confirms the results of other studies that suggest that the rates of infection in wild populations are generally very low (2 to 7%). A single infected water snail can release about one hundred mature larvae (cercariae). However, another species of the mollusc might be transmitting the parasite locally.

We also studied the genetics of the snail samples collected. Our results show that asexual reproduction is the most common mode for snails, and that a single individual can originate the installation or reinstallation of a population in a new habitat. However, we observed that this mode of reproduction was less common than in other studies, meaning there was a considerable amount of sexual reproduction. While asexual reproduction can be seen as an advantage in unstable and unpredictable habitats, sexual reproduction may be favoured here on the contrary because of the hydrological stability ensured by the presence of many canals.

The results of this doctoral thesis will enable us to better understand common liver fluke epidemiology and to make practical suggestions for decreasing the rate of infection in bulls in terms of the risky zones where herds should not graze, as well as managing water level and treatments for cattle.

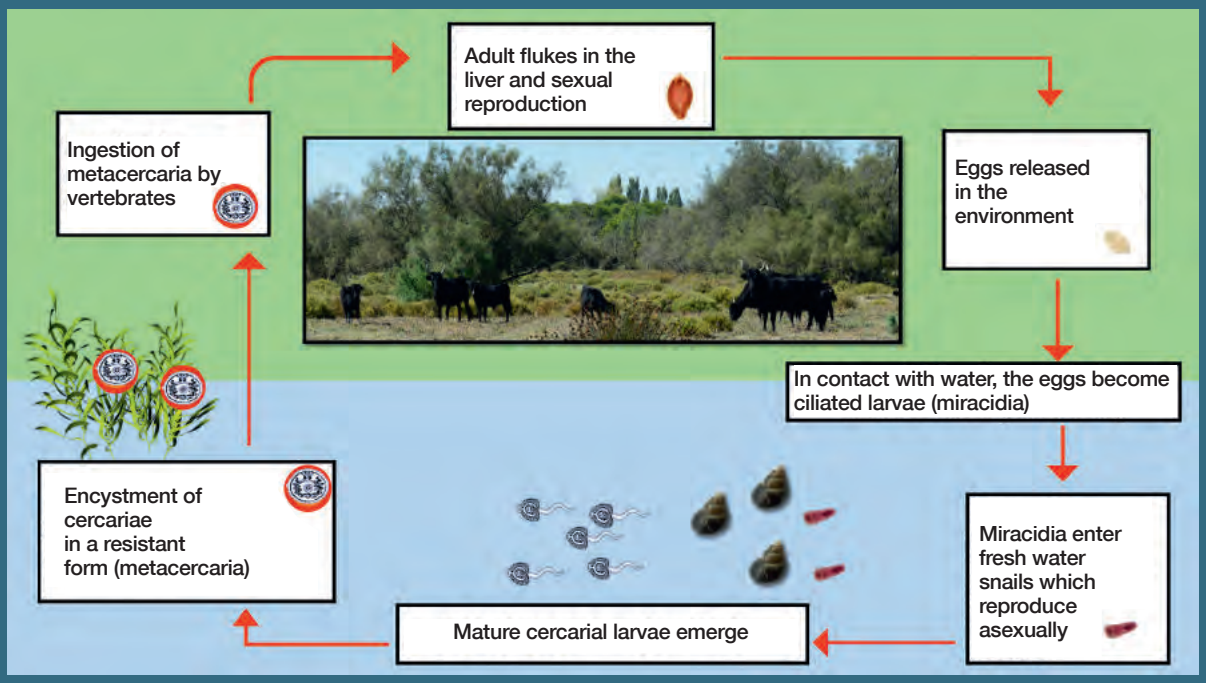


Fig. 1: Lifecycle of the *Fasciola Hepatica*

PROJECT LEADERS: Marion Vittecoq and Sylvie Hurtrez-Boussès
TEAMS: Emeline Sabourin, Species Conservation, Tour du Valat / IRD-MIVEGEC Health Ecology and Evolution team
FINANCIAL PARTNERS: Labex CEMEB
VIDEO ON YOUTUBE: Animated film that presents the parasite's life cycle, made by Emeline Sabourin and Miguel Navascués

ECOSYSTEMS
DEPARTMENT

Modelling, restoration and management of ecosystems

—

Philippe Lambret, sampling aquatic insects in the marshes at the Tour du Valat estate
© Zeppelin

The general objective of the department is to conserve biodiversity, and ecosystem functions and services, in a context of global changes by means of multidisciplinary research based on the complementarity between four research areas:

- modelling to assist management and restoration actions based on a better understanding of the functioning of ecosystems and their probable evolution;
- restoring the biodiversity and functionality of degraded ecosystems by using scientific expertise to pilot restoration actions and management decisions;
- implementing and promoting adaptive, intersectoral, and sustainable management systems integrated into the dynamics of local areas by favouring a site-based approach;
- transferring the knowledge acquired to target stakeholders (managers, decision-makers, scientists, and the general public) by designing appropriate communication tools, in particular through the actions of the Mediterranean Lagoons Transfer Unit.

Our hydrological modelling activities focused on validating the dynamics of salt crystallization and dissolution and on the thermal exchanges between coastal lagoons and the atmosphere. A study was initiated on marine stressors in the southern part of the Etangs et Marais des Salins de Camargue (EMSC) site to better understand the hydro-sedimentary dynamics of the coastal system. Our study of hydro-biological interactions was continued with the acquisition of data on fish populations to assess the effectiveness of the reconnection between the sea and the Vaccarès lagoon hydrological system.

Our study on the impact of mosquito control once again focused on experimenting with mosquito traps in Le Sambuc. In 2017, we quantified the influence of the immediate environment of the traps (sunshine, exposure to the wind, nearby vegetation, etc) on their performance and tested the effectiveness of various olfactory stimuli on different species of mosquitoes.

Our project on the socio-cultural values associated with the Greater Flamingo for improving decision making vis-à-vis the management of its population in the Camargue was finalised. The information we gathered during this project enabled us to spatialise the values linked to these flamingos. Scenarios were proposed of how the Camargue territory will evolve, and the consequences on the spatial dynamics of the Greater Flamingo were studied.

Two new Ph.D. projects were undertaken within our Restoration activities, which brings the number of doctoral dissertations to five in this department. These new dissertations focus on (1) the means for controlling invasive species after their removal by focusing on priority effects in community dynamics, and (2) the role played by ants as engineers in ecosystems for the restoration of degraded areas through the dispersal of seeds and as soil structuring agents.

We continued to apply the concept of integrated and adaptive management through experience sharing activities and by producing a film on renaturing the Etangs et Marais des Salins de Camargue site and developing an environmental education partnership that will promote the Petit Saint-Jean agro-ecological project. The first restoration phase of the EMSC site was finalised with the LIFE+ MC-SALT project.

The Mediterranean Lagoons Transfer Unit co-organised two events in Occitanie and PACA on the theme of "Mediterranean wetlands and climate change," which targeted politicians, nature managers, and socio-professionals. It also awarded the 2017 Mediterranean Lagoons Transfer Unit prize on the subject of "Economy and biodiversity in lagoon territories" to Christophe Guinot for his work on upcycling oyster farming waste to encourage the nesting of colonial Charadriiformes.

In the south-eastern Mediterranean, our activities in the Gediz Delta were maintained in spite of the geopolitical developments in Turkey. A LIFE project was launched on the management and restoration of the Prespa reed beds in Greece. We also contributed to projects related to the global saltworks initiative for the Mediterranean, the conservation of the Vjosa River in Albania and the Ulcinj saltworks in Montenegro.

Brigitte Poulin and Lisa Ernoul,
HEADS OF DEPARTMENT

© H.Hôte

The Ecosystems team

LEFT TO RIGHT, TOP TO BOTTOM:

Damien Cohez, Loïc Willm, Nicolas Beck, Hugo Fontes, Manon Hess, Emilie Luna-Laurent, François Mesléard, Samuel Hilaire, Marc Thibault, Antoine Gazaix, Philippe Lambret, Lisa Ernoul, Olivier Boutron, Marion Lourenço, Virginie Mauclert, Nathalie Barré, Nathalie Chokier.

MISSING:

Olivier Brunet, Julie Campagna, Cannelle Moinardeau, Gaëtan Lefebvre, Brigitte Poulin, Nicole Yavercovski.

ECOSYSTEMS PROJECTS

Hydro-saline monitoring on the National Natural Reserve of the Camargue (Etang du Lion), in collaboration with the SNPN Camargue (National Society for the Protection of Nature in the Camargue)
© E. Luna-Laurent - Tour du Valat

1 - Ecosystem dynamics modelling

Olivier Boutron / boutron@tourduvalat.org

In 2017, we renovated and re-equipped several hydrological measurement stations to improve our experimental data sets so we could validate our models. A bathymetric measurement campaign (LIDAR) was thus conducted on the Etangs et marais des salins de Camargue site (EMSC).

To complement the field data, we have continued developing models for the remote sensing of flood duration, crop rotation, and the total area of reed beds exploited.

In 2017, we finalised a hydro-thermal-salinity model to be used on open bodies of water. It is based on taking account of the physical phenomena related to thermal exchanges between the atmosphere and a body of water, as well as salt crystallization and dissolution phenomena.

The hydrodynamics of a coastal lagoon are controlled by meteorological stressors, and the exchanges of water with the nearby catchment areas and the sea. To improve our knowledge of marine stressors in the Camargue, we have started developing a hydrodynamic model that takes account of storm surges for part of the Camargue coastal strip.

One of the objectives of our modelling research is to develop coupled tools that link abiotic measurements with biological dynamics in wetlands. Modelling of influenza A viruses in the Vaccarès hydrological system was continued in collaboration with the Species Department, by developing epidemiological modelling with compartments, which is linked to the hydrodynamic modelling.

Finally, we have developed participative modelling tools. The project "modelling that fosters a participative approach for improving the governance of wetlands, in relation with the Greater Flamingo" came to an end in 2017. Concertation meetings were held to develop management strategies for the local territory that take account of the socio-cultural and environmental values associated with the Greater Flamingo. Multi-agent modelling was also undertaken on the EMSC site as a vegetation dynamics simulation tool in function of various environmental parameters and management scenarios. In addition, climate change forecasts have been made at the Mediterranean level so they can then be integrated into the Mar-O-Sel model in order to conduct simulations concerning the vulnerability of Mediterranean wetlands and the services they will provide in 2050 and 2100.

2 – Ecosystem restoration

François Mesléard / mesleard@tourduvalat.org

Our ecosystem restoration activities focus on three areas:

The rehabilitation and creation of ecosystems and communities

- Restoring the EMSC site for which the aim is to return to more natural hydrological functioning by recreating functional continuity between the sea and the central lagoons of the Camargue, and rehabilitating ecosystems;
- Creating a network of temporary marshes in the Camargue that will support species such as the Dark Emerald damselfly (Lestes macrostigma);
- Restoration and conservation management of Lythrum thesioides in temporary ponds (doctoral dissertation in collaboration with the University of Montpellier, Centre for Functional and Evolutive Ecology- French National Center for Scientific Research / CEFE-CNRS).

Pastoral management and biodiversity

- The roles of domestic herbivory and climate change in the maintenance of biodiversity.
- The impact of eco-pastoralism on the plant communities on dykes in the Donzère-Mondragon hunting and wildlife reserve (doctoral dissertation in collaboration with the University of Avignon, IMBE / Mediterranean Institute of marine and terrestrial Biodiversity and Ecology). This project aims to test the capacity of domestic herbivores to increase the plant diversity in artificial habitats at different spatial scales.

The control of invasive species

- Controlling the seed stock and vegetative parts of invasive species. This project aims to use microwave technology to destroy the seed banks and individual plants or parts of them present in the soil.
- Restoration of plant communities after the eradication of invasive species. The aim is to plant native species that will make or create communities that are more impermeable to invasive species (doctoral dissertation in collaboration with the University of Avignon, IMBE).

Experimentation of soil disturbances to assess their impacts on *Lythrum thesioides*
© A. Gazaix

3 - Adaptive and integrated management

Lisa Ernoul / ernoul@tourduvalat.org

To preserve landscape diversity and improve the management of wetlands, we have tested management methodologies and approaches on various sites in the Camargue and in the Mediterranean Basin. We also continued our transfer activities that use Open Standard methodologies for biodiversity conservation. The key sites for this project are the Tour du Valat and Petit Saint Jean Estates, the Verdier Marshes, and the Gediz Delta (Turkey).

Implementation of the management plan for the **Tour du Valat** is progressing as forecasted. Experimentations have been conducted with sniffer dogs in collaboration with Conservation canines to detect signs (scat) of the presence of the Ocellated Lizard. The samples collected were sent for DNA analysis to confirm their origins.

The first simplified management plan based on open standards was finalised for the **Petit Saint Jean Estate**, and a new Natura 2000 contract has been signed. Many projects have been undertaken, including the planting of hedges and vineyard plots, the digging of a new pond, the thinning of natural habitats in the pine grove, the on-site "valorisation" of cut wood and RCW (woodchips made by chipping small- to medium-sized branches). Long-term partnerships with livestock breeders and farmers in the area have also been confirmed.

The **Verdier Marshes** management plan was evaluated, and a new Interreg project (WetNet) has been launched, which aims to test innovative governance tools in order to improve the collaborative management of the site. Participative management activities are being continued.

In the **Gediz Delta**, we have continued to work closely with the University of Ege. Inventories and reptile and amphibian monitoring were continued for the fourth consecutive year. The results of this work are conveyed to the general public through local educational campaigns and publications in scientific journals.

Other sites:

An Osprey nesting platform was installed in April 2017 in the **Tourtoulen Woods in the Camargu**e. This operation aims to improve the connections between core breeding populations of the Mediterranean Osprey. Ecological expertise, including management recommendations, was provided to the French Coastal Protection Agency (Rives du Petit Rhône site, 41 ha).

Search for hints showing the presence of the ocellated lizard thanks to the snifer dogs of Conservation canines
© Jean E.Roché

4 - Mediterranean Lagoons Transfer Unit

Virginie Mauclert / mauclert@tourduvalat.org

The Tour du Valat pilots the "Mediterranean Lagoons Transfer Unit" consortium in partnership with the Languedoc- Roussillon Natural Area Conservancy (CEN) and the Corsican Environmental Office (OEC).

Field of action: French Mediterranean coastal lagoons and their peripheral wetlands, which form a chain covering 130,000 hectares of the Occitanie / Pyrénées-Méditerranée, Provence-Alpes-Côte d'Azur and Corsica regions.

Mission: to foster better recognition of lagoons and encourage their sustainable management among the various stakeholders involved, through three areas of action.

Mutualising knowledge and good practices

The information portal on lagoons (www.pole-lagunes.org) and its Lagoons newsletter have been made more modern and accessible.

Facilitating an exchange network

Several meetings were organized on the current state of knowledge about Mediterranean lagoons and issues. The different points of views of the stakeholders – site managers, scientists, those who work for State services, and elected officials were shared and compared: "Fish in lagoons: what is the state of our knowledge, and for what management?" in Lattes in the framework of the research-management platform.

The winners of the 2017 Mediterranean Lagoons Transfer Unit Prize
© Ville d'Ajaccio

Poster made by the Mediterranean Lagoons Transfer Unit
© Jean E.Roché

"Adapting sustainably to climate change in a lagoon territory" in Montpellier and targeting elected officials of Occitanie.

"Coastal wetlands confronted with climate change" at the Tour du Valat, in collaboration with the PACA Regional Group of Experts on the Climate.

Awareness raising through key events

A new record of participation was set for World Wetlands Day and European Heritage Days in lagoon territories, with 31, 000 people attending the various events organised.

The 2017 Mediterranean Lagoons Transfer Unit Prize on the theme of "Economy and biodiversity" was awarded to Christophe Guinot, an oyster farmer in the Salses-Leucate lagoon (Aude) for his joint initiative with the "Narbonne Mediterranean Regional Natural Park". His oyster shells now cover the islets of the former Sigean saltworks, which are used for breeding by colonial Charadriiformes.

FOCUS

Our ecological restoration projects

Ecological restoration can be defined as the processes through which destroyed or partially destroyed ecosystems are intentionally restored. This is not a new activity for the Tour du Valat, whose first such projects date back to the 1980s. It is based on civil engineering works that make it possible to set up ad hoc management systems, and on the two main tools of wetland management, hydrology and herbivory. It uses the techniques developed in restoration ecology (sowing, soil transfer, control of competitive species) and ecological engineering to favour the species expected to play a major role in the restoration of the habitat.

The possibility of orienting the vegetation dynamics toward the desired communities by giving preference to certain species still needs to be demonstrated for numerous habitats. Experimentation is therefore being conducted to test how the tools available today such as hydrology, herbivory, and the introduction of species can be used to set population, community, and ecosystem dynamics on the desired paths. Experimentation is also being used to assess the importance of competition and the order of arrival of species on the structure of future communities. These experiments are conducted in greenhouses and mesocosms, and also in the field at the scale of the habitat to be restored. In this case, they are "true life" applications, as well as actual restoration operations.

Restoration: from theory to practice

Strictly speaking, restoration, whose aim is to re-establish the biotic integrity of an ecosystem before its degradation, remains a theoretical objective. In reality, restoration usually only concerns the rehabilitation of functions or parts of ecosystems.

Such is the case for the Cassaïre Estate, 70 ha of former farmland to be transformed into a wetland for the purposes of conservation and hunting. An initial study, taking account of the impermeability of the soil and its variations, conditioned the boundaries of the wetland and its profile. Our analysis of the seed bank showed that the desired species were absent, so we tested two propagule dispersal techniques. The traditional seeding technique was tested on the edges of the wetland. The other, new, technique consists in first identifying sites during the growing season where the desired species are found. Then, during the dormant season, samples of soil from where these species grow are taken and the areas of marsh to be restored are inoculated with these samples.

Manon Hess during an experimentation aiming at evaluating the respective role of the different species of the seed bank © Tour du Valat

Such is also the case for a population of *Lythrum thesioides*, an annual plant found in temporary wetland habitats, of which only three populations are known to exist in the world, one of which was discovered during an impact study before the construction of the high-speed train line between Nîmes and Montpellier. In depth knowledge about the seed bank, the ecological requirements of the species and its population dynamics are absolutely necessary before we can propose the measures needed to ensure the conservation of this population.

Bull ranch of the Tour du Valat © H. Hôte

Pastoralism: a major restoration tool

The Tour du Valat has played a pioneering role in this domain. For over 40 years, it has been testing out the interest of pastoralism for the conservation of protected habitats, focusing on two questions:

- How can we restore habitats that are being overgrown?
- How can we increase diversity at different spatial scales?

These two questions are currently being studied in two types of ecosystems: natural ecosystems and ones that are newly established after major disturbances. In both cases, domestic grazing is a powerful factor for increasing biodiversity, at various scales ranging from a patch of vegetation to an entire landscape. In the case of the Donzère Mondragon hunting and wildlife reserve on the banks of the canals made when the Donzère Mondragon hydroelectric station was built, the response of the vegetation to the domestic grazing put in place corresponds very precisely to what would be expected for more natural habitats.

Pastoralism: a catalyst for the selective role played by the Mediterranean climate

Domestic grazing is a key element for managing marshes, and also Mediterranean grasslands. It controls, to a very large extent, the competition between species, and is therefore indispensable for the presence of numerous characteristic plants that are not very competitive. Our studies conducted over the past two decades highlight the decisive role played by interannual pluviometric variability, which is specific to the Mediterranean region. When grazing is practiced, this variability partly influences the structure of herbaceous communities. While the rainfall in the spring and especially the autumn are recognised to be decisive for grasses, the most recent studies conducted on the Tour du Valat Estate highlight, contrary to what is generally assumed, the importance of summer rain. Rain at the beginning of the summer is likely to significantly modify the composition and the structure of plant communities the following spring.

Controlling undesirable species

The fight against undesirable species is most often a failure, because the presence of propagules in the soil and their regrowth capacity lead to a rapid recolonisation of the habitat by these species. In order to limit the need for recurrent interventions (pulling out plants), our research focuses on two areas: destruction of the seeds and vegetation present in the soil, and making the habitats impermeable to colonisation by these species.

The first area concerns the utilisation of microwaves directly in the field on dug-up soil in which undesirable seeds are present. This method, with which we are currently experimenting, seems to be the only large-scale way to eliminate seed stocks in “contaminated” soil.

The methods for controlling undesirable species (soil extraction, pulling out plants) are major disturbances for the habitat concerned, leaving all or part of the soil exposed and favouring the regrowth of species adapted to these conditions. Our second area of research focuses on the ways of avoiding recolonisation by undesirable species through the rapid growth of plant communities (seeding indigenous species). The experiments we are conducting aim to evaluate the different roles played by the order of arrival of the species (priority effect) and the density and diversity of the plant communities seeded in terms of permeability to colonisation.

PROJECT LEADER: François Mesléard

TEAM: Olivier Boutron, Hugo Fontes, Antoine Gazaix, Philippe Lambret, Nicole Yavercovski, Loïc Willm, Tania de Almedia (PhD student), Manon Hess (PhD student), Cannelle Moinardeau (PhD student)

SCIENTIFIC PARTNERSHIP: IMBE Marseille-Avignon, Université d'Avignon, Université de Rennes, CEFE-CNRS Montpellier, Aarhus University, Supagro-Montpellier, CIRAD Montpellier, ONCFS

TECHNICAL AND FINANCIAL PARTNERSHIP: Agence de l’eau Rhône-Méditerranée Corse, Association des Amis des Marais du Vigueirat, Compagnie Nationale du Rhône, EDF, Grand Port Maritime de Marseille, GECO (renaturation) NGE-Guintoli (construction industry), ONCFS, Banque Publique d’Investissement, PNRC, Région PACA, Région Occitanie, Réserve Naturelle de Camargue, SAIREM (Microwave), WWF France

Retrospective 2017

WETLANDS AND CLIMATE CHANGE" EXCHANGE DAY

at the Tour du Valat in partnership with GREC PACA (Expert group on climate in Provence-Alpes-Côte d"Azur)

© Tour du Valat

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The stakeholders of the European projects Ecopotential and Swos met at the Tour du Valat

SUMMER TEAM MEETING FOR THE ECOSYSTEMS DEPARTMENT

© Tour du Valat

THE TOUR DU VALAT FISH TEAM IS REALLY CONCENTRATED!

© Tour du Valat

© Tour du Valat

Many Mediterranean partners met in Bizerte (Tunisia) for the launch of the MAVA project "a communication campaign on coastal wetlands"

EXCHANGE AND VISIT OF THE ESTATE WITH ATELIERS LUMA

© Chloé Castellas

YEARLY GATHERING OF THE FRIENDS OF TOUR DU VALAT ASSOCIATION

© Tour du Valat

© Jean Jalbert

Envies Rhônements 2017

© Irene Badone

"Well, this is a quite unusual atmosphere!"

© Jean E. Roché

One of our Arts"sciences duologos Marion Vittecoq and Yann Lheureux

9TH SEMINAR OF FRENCH RAMSAR SITE

© Tour du Valat

Bassin du Drugeon , with the French Ramsar site managers

© Tour du Valat

MEETING IN SARDINIA OF MAVA PROJECTS STAKEHOLDERS

THANK YOU CORINNE, FOR THESE TASTY DISHES

Participation to the Eurosite General Assembly

© Tour du Valat

© Zeppelin

Smoking the shisha? No, calf testing (to evaluate the number of mosquito bites)

SCHOOL TRIP TO DISCOVER THE SALINE PONDS OF VILLENEUVE LÈS MAGUELONE

© Jean. E Roché

OBSERVATORY
DEPARTMENT

Mediterranean Wetlands Observatory

Prespa lake
© J.Jalbert

The Mediterranean Wetlands Observatory (MWO) is a wetlands management tool developed within the framework of the MedWet initiative and the Ramsar Convention. The MWO has two principal objectives:

- To analyse the status and trends of the Mediterranean wetlands, their biodiversity and the goods and services they provide, as well as the anthropogenic environnemental factors that explain these trends;
- To promote effective decision making.

In 2017, the MWO invited Sara Fraixedas to join them for a one year postdoc project to estimate the resilience of the ecological functioning of the Camargue. Nigel Taylor has started his knowledge synthesis project, in collaboration with Cambridge University, to identify what kind of management intervention were already identified to be effective for the conservation of wetlands. Nadège Poppoff and Clément Merle were welcomed to help Anis Guelmami with the development of geo-datasets for the MWO and new Earth Observation-based wetlands monitoring tools within the frame of the SWOS project. Sofia Lopes enforced the department as European volunteer. Ilse Geijzendorffer replaced Patrick Grillas as coordinator of the department.

Scientifically it has been a very rewarding year with 10 peer reviewed publications and the highlights of 2017 have been:

- Perennou et al; “Mapping Mediterranean wetlands: a good-looking map is not always a good map” a publication that presents the progress made to date and monitor changes in Mediterranean wetlands using remote sensing data and the challenges that still need to be addressed.
- Geijzendorffer et al “Ecosystem Services in Global Sustainability Policies” highlighting the importance of ecosystem services for advancing towards the Sustainable Development Goals and the Aichi targets.

In a series of workshops, Sara Fraixedas, Thomas Galewski and Sofia Lopes consulted experts of species in the Camargue to document the knowledge of changes in species abundances in the last 40 years. Nearly all mammal, bird, amphibian, reptile, fish, Odonata, Orthoptera and vascular plant species (around 2,000 species) were evaluated.

In the absence of a coordinator of MedWet, collaboration was not easy, but nonetheless the scientific work preparing the launch of the Mediterranean Wetlands Outlook 2 is well on the way. The first monitoring of recreational and educational services of wetlands took place in 27 sites of 10 countries, involving 4 000 visitor surveys. The validation phase of Earth Observation-based dataset from the project GlobWetland-II was finalized, revealing many significant uncertainty margins which confirm the necessity of including such a step in remote sensing projects.

The MWO contributed to the regional assessment of IPBES (The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services) ensuring the representation of biodiversity and ecosystem services related to wetlands, as well as published a paper on the importance of monitoring ecosystem service for the Sustainable Development Goals.

In 2017, important progress was also made with research determining the impact of protection on the population trends of waterbirds in the face of climate change. Strictly-protected species adapt better to climate warming than unprotected species and they show more positive population trends despite climate change. Mediterranean wetlands experience different degrees of reductions in precipitation and increases of temperature, but the wetlands that are most impacted are also least well protected.

With a new coordinator installed for MedWet, the content of the Mediterranean Wetlands Outlook 2 well on its way, the first results on the impact of protection status and climate change on Mediterranean wetlands, the MWO is preparing itself for an eventful 2018.

Ilse Geijzendorffer,
HEAD OF DEPARTEMENT

© H.Hôte

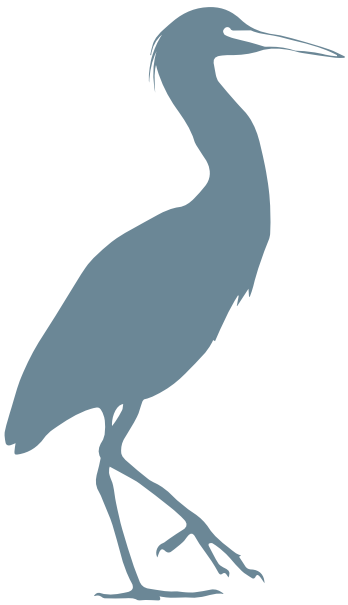
The Observatory team

LEFT TO RIGHT

Laurent Chazée, Thomas Galewski, Sara Fraixedas, Christian Perennou, Ilse Geijzendorffer, Sofia Lopes et Nadège Popoff.

MISSING:

Élie Gaget, Patrick Grillas, Anis Guelmami, Clément Merle et Nigel Taylor.



OBSERVATORY PROJECTS

Fisherman
on Mikri Prespa lake
©Jean Jalbert

1 – Ecosystem services

Ilse Geijzendorffer / ilse@tourduvalat.org

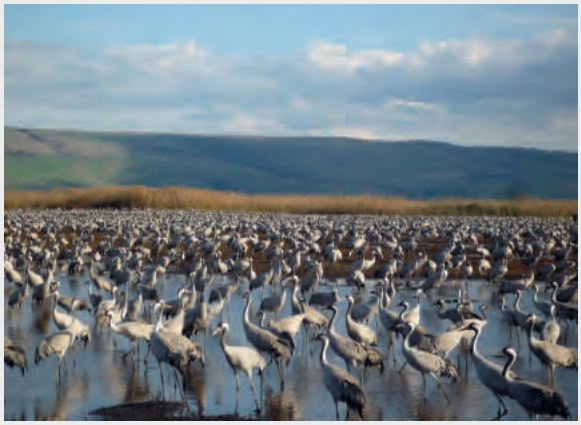
Ecosystem services form an important argument for the conservation and sustainable management of Mediterranean wetlands, because they embody how society and nature interact and depend on each other. Healthy and ecologically functioning ecosystems contribute to safeguarding human well-being. Our objective is to study the complex interactions of socio-ecological systems to allow for better informed integrative management and decision making.

In 2017, we focused on monitoring human and social impact of recreational and educational services of wetlands in 27 sites spread over 10 Mediterranean countries. Additionally, we collected data to identify whether the resilience of the ecological functions of the Camargue have changed over the last 40 years. In the SWOS project (within the frame of the H2020 European Union Innovation and research program), we developed a new remotely sensed indicator to monitor the flood regulation service at larger geographical scales. This approach was tested for six Mediterranean coastal watersheds in Spain, France, Croatia, Tunisia, Algeria and Morocco. Finally, we applied a commonly used approach to link changes in land cover types to changes in the potential supply of ecosystem services. To increase the visibility of the ecosystem services provided by wetlands, the Mediterranean Wetland Observatory (MWO) actively contributed to the Regional assessment of IPBES (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services) of Europe and Central Asia, as well as to the STN (Scientific and Technical Network) of MedWet and the STRP (Scientific and Technical Review Panel) of Ramsar.

In ECOPOTENTIAL, another European Union H2020 research program, we develop remote sensing and social media data mining methods to map ecosystem services for managers of protected areas. Finally, in collaboration with the ESP (Ecosystem Services Partnership) and GEO BON (Global Earth Observation Biodiversity Observation Network) group we published a paper on the importance of ecosystem services for the Sustainable Development Goals.

2 – Monitoring the biodiversity of Mediterranean wetlands

Thomas Galewski / galewski@tourduvalat.org



Common cranes in Hula wetlands, Israel © T.Galewski

By improving our understanding of the trends in biodiversity as well as the impacts of the pressures, we aim to improve the inclusion of biodiversity conservation in management and policy decisions. In particular in 2017, we updated the computation of the Living Planet Index at the Mediterranean basin and PACA scale, as well as the Red list of plant species. In terms of pressures, we studied the impact of increases of temperature on wintering water bird populations. Preliminary results demonstrate that a strict protection of species and habitats positively affects species population trends and enable them to better adapt to climate change, whereas hunting and conversion of natural wetland habitats negatively affects population trends.

To get a more complete idea of the impacts if pressures of both species richness and abundances, a series of workshops consulted experts on their perceptions of trends of specific species groups in the Camargue over the last 40 years. An impressive total number of 1971 species were treated, with general results demonstrating a slight increase in species richness, but a more significant trend of reducing abundances. Trends vary among taxonomic groups with a strong decline observed in amphibians, Odonata and Orthoptera, moderate to low decline in birds, mammals, reptiles, fish and overall stability for plants.

3 – Water monitoring

Christian Perennou / perennou@tourduvalat.org

This axis focuses on improving our understanding and monitoring of water cycles (flow, quantity, quality) and the use and needs of people and nature. This information is used to interpret trends in other indicators related to biodiversity and habitats.

For the data and indicators related to inundation and natural water cycles, remote sensing is an important source of data at the scale of the Mediterranean basin. As the MWO has already participated in several research project on remote sensing, with the most recent ones being SWOS, ECOPOTENTIAL and GlobDiversity, we published a paper on the progress made to date using remote sensing to monitor Mediterranean wetlands, and on the remaining challenges to be addressed (see focus article on p. 42).

In addition, we finalized the validation phase of the GlobWetland-II dataset of 305 wetland sites in the Mediterranean basin which have subsequently been used in cross analysis with spatial data layers from the biodiversity axis.

To update both the type of indicators used for water monitoring and the quantification of existing water indicators, an extensive literature review took place. The results are included in the second Mediterranean Wetlands Outlook report, to be published in 2018. Finally, we also conducted a cross-analyses of the water related indicators of this report with those of other major international policy conventions (e.g. Ramsar, Convention on Biological Diversity, Sustainable Development Goals), to identify possible future synergies.

Dalmatian Pelicans
© Jean Jalbert

4 – Local and national observatories

Christian Perennou / perennou@tourduvalat.org

The objective of this axis is to help other Observatories with their monitoring ambitions and capacity building, based on existing experience and knowledge of the MWO.

IN 2017, SEVERAL INITIATIVES WERE UNDERTAKEN:

- The MWO provided technical assistance to the "Maghreb Wetlands Sentinels" project which was coordinated by WWF Tunisia. Contributions from MWO were in the form of providing training sessions and guidance with indicator selection, protocol and monitoring, for both NGOs and public institutions.

  The MWO also contributed to the National Wetlands Observatory (ONMH), an initiative of the French Ministry of the Environment. Contributions resulted in a technical report on interpreting land-use change within French Ramsar sites, as well as two technical factsheets on two new indicators for the ONMH: one on the number of visitors per wetland site and the other on the Living Planet Index for wetlands.

- The observatory of the PACA region requested a regional Planet Index, which highlights contrasted trends according to species and attests for the efficiency of nature protection measures. Habitats with the highest protection level and/or least affected by human pressure observe a biodiversity increase (alpine environments: chamois, ibex; marine protected areas: brown grouper; protected wetlands: greater flamingo and Eurasian spoonbill). Non-protected areas observe a decline in biodiversity, notably in Inland Provence, as confronted with heavy urbanization and change in agricultural practices, which are often harmful for numerous species. Likewise reptiles and amphibians are globally subjected to increasing threats. Negative trends on these habitats are so high that some species once common are now rapidly declining.

THE TEAM ALSO CONTINUED ITS CAPACITY STRENGTHENING ACTIVITY THROUGH:

- The hosting of the Observatory of the Upper and Inner Niger Delta, Mali, at Tour du Valat to exchange with the MWO about the setting up of a monitoring program;
- A training workshop in Dubaï on the sustainable management of wetlands;
- Support through the SWOS H-2020 project, to the Algerian General Directorate of Forestry with the implementation of their National Wetlands Strategy, by providing capacity building and mapping products for all Algerian Ramsar sites (50 wetlands), using remote sensing data and including a retrospective analysis covering four time periods (1975, 1990, 2005 and 2015).

Birdwatching in Sardinia with numerous partners
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5 – Wetlands in the framework of sustainable development in the Mediterranean

Laurent Chazée / chazee@tourduvalat.org

Training session on sustainable wetland management in Dubai
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The objective of this axis is to provide evidence and knowledge on the social and economic context of Mediterranean wetlands. The DPSIR (driver-pressure state-impact-response) model has been used as conceptual framework to organize the thinking for the work of the MWO. This allows analyzing of the impact of drivers and pressures on wetlands with focus on land, biodiversity and water, as well as that it specifically makes the bridge to the policy processes national and regional decision makers are involved in.

In 2017, work mainly focused on an inventory of potential macro-indicators for socio-economic variables and the development of a database. These indicators have subsequently been grouped based on similarity in changes over time to obtain a more feasible indicator set for monitoring purposes. It has been tested at the national scale (for five countries) and at sub-regional level (Maghreb). This exercise enabled to identify the most efficient scales for monitoring and analyzes in link with MWO indicators.

In a next step in 2018, the datasets for the selected indicators will be analyzed in the DPSIR framework with downscaling to subregion to better understand driver, pressure and impact relationships. Results will be made spatial so that cross-analyses can be undertaken with indicators from other axis, such as biodiversity, water and ecosystem services.

In addition, to the first analysis of the macro-indicators, a publication was developed to demonstrate the importance of ecosystem services for the Sustainable Development Goals.

6 – Cross-analyses and database

Anis Guelmami / Guelmami@tourduvalat.org.

The objective of this axis is to use a central database with spatial datasets that have been developed and collected over time by the MWO in cross-analyses.

In 2017, the first activities for a new tool were developed. The spatial data layers that the MWO has been developing in recent years has been bundled into a central database to facilitate consultation of different cross-disciplinary research questions. The first research questions addressed include:

- An identification of the impact of protection status and climate change on the species diversity,
- An assessment of global change impacts on the Mediterranean wetland habitats using Essential Biodiversity and Climate Variables to monitor wetlands status and trends (habitats and biodiversity).

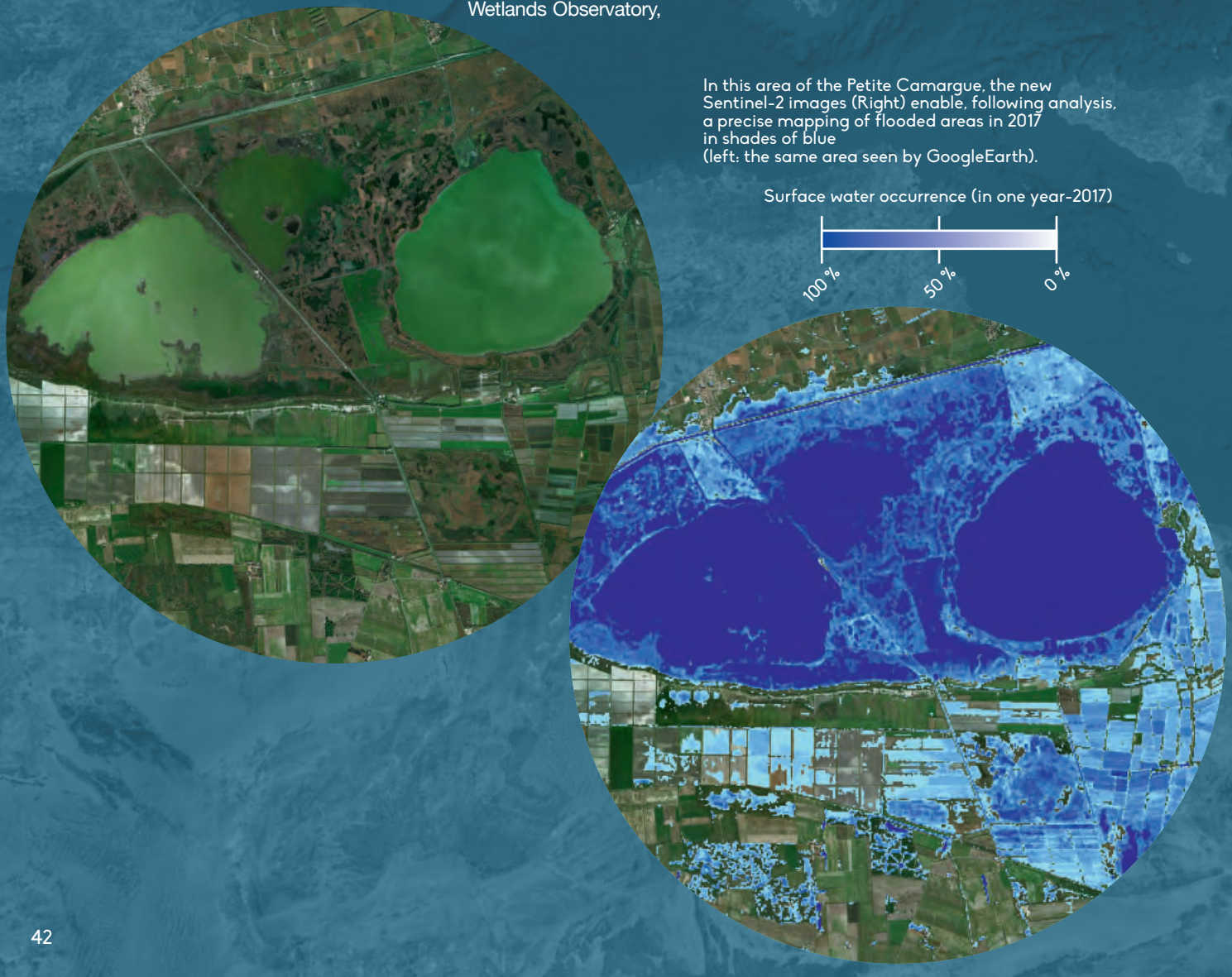
This new work stream has been implemented in 2017, and two cross-analyses have been addressed and will be finalized in 2018.

Training of local stakeholders, El Kala, Algérie © Tour du Valat

FOCUS

Remote-sensing for monitoring Mediterranean wetlands: a good-looking map is not always a good map!

In an epoch of generalized environmental degradation, monitoring Mediterranean wetlands status and trends is crucial if we want to conserve them. Remote-sensing allows the MWO to collect data in the same way across sites, including retrospectively and in regions that are very remote or diffi-cult to visit for political reasons. It also helps to identify areas that likely host wetlands ("pre-inventories" of Mediterranean wetlands) and to target sampling and observation efforts for biodi-versity monitoring. Satellite imagery has long been an important tool for the Mediterranean Wetlands Observatory, yielding information on the trends in wetland surfaces, their conversion rate to farmland or urban areas, the extent of inundation within their limits, etc. For instance, within a sample of 214 coastal, wetland sites spread all around the Mediterranean, wetland habitats have declined by 13% during 1975-2005, while at the same time man-made wetlands (fishponds, salinas, etc.) increased by 158%. On the other hand, the extent of flooding showed no decline over the same period, but just fluctuations.



In this area of the Petite Camargue, the new Sentinel-2 images (Right) enable, following analysis, a precise mapping of flooded areas in 2017 in shades of blue (left: the same area seen by GoogleEarth).

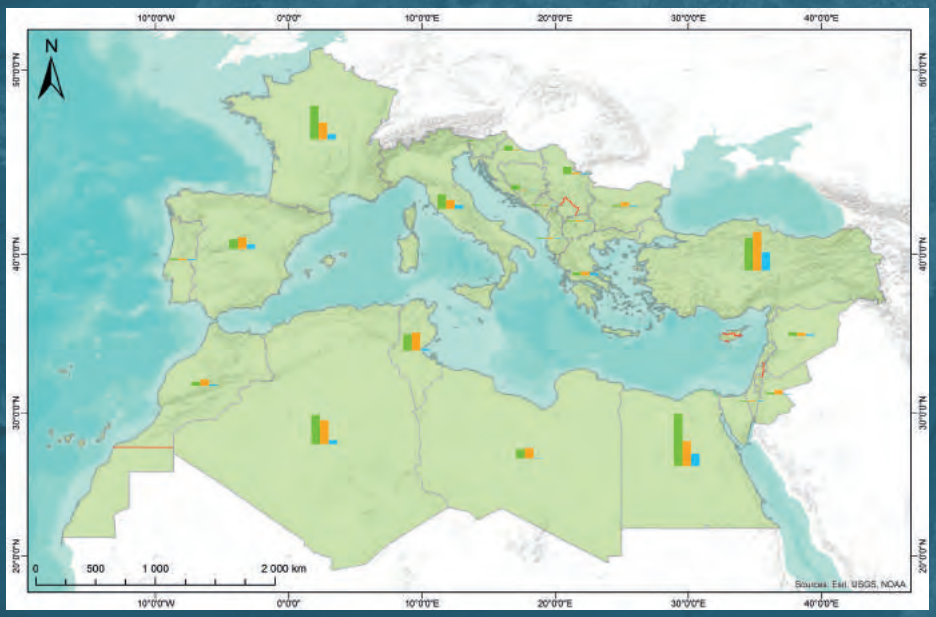
In (semi)arid regions such as the Mediterranean, wetlands have inherent characteristics that make their precise identification and measurement from satellites challenging. For instance, it is not al-ways easy to distinguish wetland habitats from merely flooded land, or artificial from natural wet-lands. The condition of wetlands (inundated %) can vary a lot between or within years. In a region with both a strong variability in rainfall and temperatures, and long-term trends towards a drier, hotter and more unpredictable climate, the detection of real wetland trends is therefore not straightforward.

Although new satellites such as the Sentinels of the European Space Agency have improved possibilities, better technology is not a panacea and a few challenges remain before robust, fully reliable results can be produced routinely. Some recent projects have not been devoid of signifi-cant (and sometimes massive) errors. The most frequent reasons are that wetland ecologists have not always been fully involved in remote-sensing projects, and the importance of field validation procedures has not always been realized, although they are crucial for checking that the interpreta-tion done in a lab of a set of satellite images reflects adequately the ground truth.

The Observatory, through a critical analysis of some recent results, drew lessons and emphasised the main requirements for solving the persisting challenges, e.g. a robust habitat nomenclature for Mediterranean wetlands, protocols for habitat identification that are based on integrated knowledge of wetland ecology, hydrology and remote sensing, and a systematic quantification of errors.

Thanks to recent advances, the majority of these challenges can now be solved at the local scale of one site, for one date. But larger-scale, multi-site assessments (e.g. the whole Mediterranean region) and retroactive studies still require improvements. Areas for future progresses include a better separation of particular habitats, such as wet meadows from other meadows, ricefields from other crops, natural vs. man-made wetlands... A better detection of flooding under dense or emer-gent vegetation is also required, as well as procedures for distinguishing the natural variability in hydrological cycles from long-term trends, and a better quantification of uncertainties.

With the increasing integration of knowledge from ecologists with remote sensing expertise, the optimal exploitation of new satellite images in Mediterranean wetlands monitoring is a foreseeable objective.



Comparison between national estimates of total wetland surface for Mediterranean countries
- from national estimates collected byMediterranean Wetland Observatory.
- From Global Lakes and Wetlands Database
- from surface waters in Global Surface Water database

FOR FURTHER INFORMATION: Perennou C., Guelmami A., Paganini M., Philipson P., Poulin B., Strauch A., Truckenbrodt J., Tottrup C., Geijzendorffer I.R. 2018. Mapping Mediterranean wetlands with remote sensing: a good-looking map is not always a good map. Advances in Ecological Research 58: 243–277.

HEAD OF PROJECT: Christian Perennou perennou@tourduvalat.org; Anis Guelmami guelmami@tourduvalat.org

TEAM: Observatoire des Zones Humides Méditerranéennes

FINANCIAL PARTNERS: European Commission (Horizon 2020 Programme), Fondation Prince Albert II de Monaco, Fondation Total, Ministère de la transition Ecologique et Solidaire

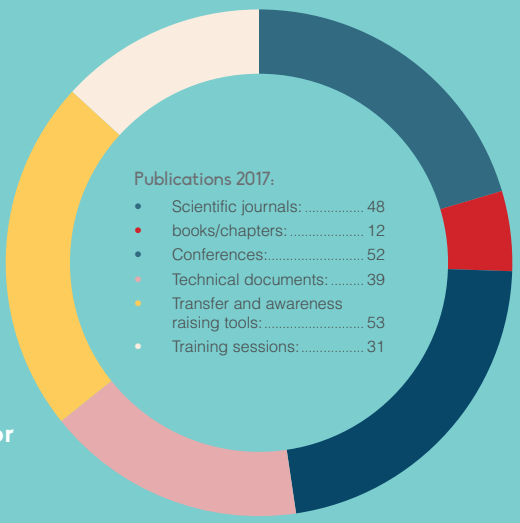
TECHNICAL PARTNERS: Agence Spatiale Européenne, JenaOprtronic (Jena, D), MedWet, University of Malaga

Hugo Fontes,
RESEARCH ASSISTANT

“ Walking, exploring nature, observing and experimenting its functioning, to understand and preserve it. ”

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.



With 48 papers published in international scientific journals, our scientific production is at a high level, both in the number of papers published and their importance (including their impact factor cf. figure p.46).

Our activities are not limited to our scientific publications, and our publications are diversified both in terms of the nature of the documents (see figure above) and the target audience (scientists, site managers, technicians, students, the general public, and decision makers).

- An article showing how hydrology and health ecology can cooperate to model avian flu virus dynamics and the places where high concentrations are the most probable.
  Vittecoq M., Gauduin H., Oudart T., Bertrand O., Roche B., Guillemain M., Boutron O. 2017. Modeling the spread of avian influenza viruses in aquatic reservoirs: A novel hydrodynamic approach applied to the Rhône delta (southern France). Science of the Total Environment 595:787-800. DOI: http://dx.doi.org/10.1016/j.scitotenv.2017.03.165.
- A publication showing how wildlife can contribute to decreasing the density of weeds in rice fields.
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- An article showing the contribution made by ecology in assessing the performance of alternative methods for controlling mosquitoes.
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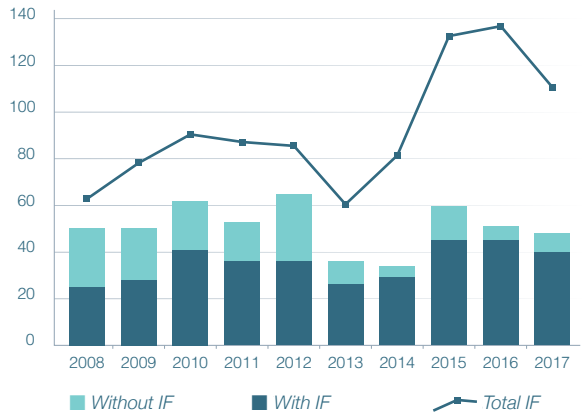
Publications



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Black-winged stilt
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Transfert

In addition to the numerous scientific papers and technical reports we publish, every year we conduct various transfer activities aiming to popularize our research. This work can occur during side-line events at major international meetings as well as in schools, and with politicians, natural area managers, and the public.

Several such events are organised for World Wetlands Day, European Heritage Days, the Camargue Festival and the "Envies Rhônements" Festival. We also participate in science cafés, and organise technical meetings with the Mediterranean Lagoons Transfer Unit (MLTU), for example "Wetlands and climate change" organized in Tour du Valat with the support of GREC PACA.

All the communications presented during this event were recorded and are now available on our web site. Several short videos were produced such as the one on " the adaptive management of the lagoons and marshes on the former camargue saltworks site » and a second one, launching our new collection "Portrait of a researcher" with Elie Gaget, a PhD student working on the impact of global changes on wintering waterbirds.

Learn more about our many achievements on our document base, **tourduvalat.centredoc.fr** and on our new website.

Conferences & Seminars

Tour du Valat welcomes numerous partners and scientists to attend conferences and seminars dealing with conservation of Mediterranean wetlands areas.
The seminars are open to everyone, and generally take place on Monday morning. The programme is sent to natural area managers, scientists and local decision-makers. To be added to our list, write to com@tourduvalat.org, or to sign up yourself, go to www.tourduvalat.org.

- *Distribution océanique et comportements de plongée des juvéniles de manchots royaux et d'éléphants de mer dans le sud de l'Océan indien.* Florian Orgeret (CEBC-CNRS de Chizé)
- *Modélisation intégrée d'un écosystème et optimisation de ses services.* Cédric Gaucheret (INRA, Montpellier)
- *Métamorphoses.* Film de Sacha Bollet et Benoît Demarle (Association Le Gobie)
- *Présentation des résultats de l'étude Coprophages.* Alexandre Millon (IMBE) et ses étudiants du master EEGB d'Aix-Marseille
- *Prendre la mer pour regarder la terre: présentation de l'observatoire photographique du paysage littoral vu depuis la mer et de son exposition itinérante dans les Bouches du Rhône.* Luc Talassinos (DREAL PACA)
- *Caractérisation de la vulnérabilité des zones humides de PACA au changement Climatique.* Sophie Ginguand (Tour du Valat)
- *Chauffage du sol par traitements micro-ondes pour contrôler la germination des espèces végétales invasives.* Manon Hess (Tour du Valat)
- *Les droits de la Terre, pourquoi ?* Clément Wittmann
- *From Paleoclimate Variables to Prehistoric Agriculture: Settlement Patterns, Human Environments, and Process-Based Agroecosystem Modeling in Holocene Provence.* Daniel Contreras (IMBE)
- *Conservation d'une espèce annuelle fugitive très rare: Lythrum Thesioides.* Antoine Gazaix (Tour du Valat)
- *Pressions anthropiques et dynamiques de communautés d'oiseaux d'eau en bassin Méditerranéen.* Élie Gaget (Tour du Valat)
- *Biodiversity and business: striking the balance between science and practice.* Eugenie Regan (The Biodiversity Consultancy, Cambridge, Royaume-Uni)
- *Spoonbill migration in a changing world: from pattern to mechanism?* Tamar Lok (CEFE & CNRS, Montpellier)
- *De l'envol à la première reproduction: aspects écologiques et évolutifs des traits d'histoire de vie de jeunes oiseaux marins longévifs.* Rémi Fay (CNRS de Chizé)
- *La terre des artifices, vingt ans après…* Claude Gagnaire
- *Les dispositifs artificiels au service de la compensation écologique sont-ils des pièges écologiques ? Questionnements et perspectives autour du Rollier d'Europe* Timothée Schwartz (Tour du Valat)
- *Impacts of oil palm expansion on avian biodiversity in a Neotropical natural savannah.* Lina Lopez Ricaurte
- *Modeling the spread of Avian Influenza Virus in aquatic reservoir with epidemiological and hydrodynamic approaches: A case study in Rhone delta.* Matteo Darienzo
- *De l'appel au rappel: le rôle stratégique de la science et de l'expertise dans la mise en place de politiques de biodiversité.* Aleksandar Rankovic & Yann Laurans (Institut du Développement Durable et des Relations Internationales – IDDRI)
- *Conservation Canines.*Heath Smith & Rita Santos (Conservation Canines & Université de Lisbonne)
- *Informing wetland conservation with scientific evidence.* Nigel Taylor (Tour du Valat)
- *De Ushuaïa 54° Sud en péninsule Antarctique à 64° Sud: retour sur un merveilleux voyage en Antarctique du 10 au 25 février 2014.* Sylviane Johnson
- *Sustainable rice cultivation: different approaches in Italy.* Franco Tesio (ValOryza, Italie)
- *Twitter, an introduction for Scientists.* Maïlis Renaudin (Medwet) et Nigel Taylor (Tour du Valat)
- *Modélisation des impacts du pâturage bovin sur les mares temporaires de Camargue.* Camille Carpentier (UMR Botanique et Modélisation de l'Architecture des Plantes, CIRAD Montpellier)

Delphine Nicolas' conference on "the incredible story of the *Anguilla anguilla*"
© Tour du Valat

- *Suivi de la reproduction de l'Ibis falcinelle en Camargue: retour d'expérience et résultats préliminaires.* Irene Badone (Tour du Valat)
- *Trends in Teal bag in the Camargue: impact of weather and multi-scale abundance.* Julie Galia (ONCFS)
- *Comparaison de deux suivis temporels de la faune piscicole dans l'Etang du Vaccarès.* Nicola Chericoni (Tour du Valat)
- *Cartographie des dynamiques spatio-temporelles des zones inondées méditerranéennes.* Amandine Thomas (Tour du Valat)
- *Les paysans soutiennent la biodiversité: expériences en Suisse.* Simon Birrer (Station ornithologique de Sempach- Suisse)
- *Présentation du Guide illustré de la faune de Méditerranée.* Cyril Girard (Éditions Mediterraneus)
- *Influence des interactions de compétition entre espèces végétales sur l'attractivité des plantes aux pollinisateurs.* Floriane Flacher (Université Paris Diderot)
- *Application, mise en oeuvre et limites de l'évaluation des services écosystémiques à l'aide d'une matrice de capacité à dire d'expert.* Philip Roche et Sylvie Campagne (Irstea, Aix en Provence)
- *Tests méthodologiques pour la localisation des zones humides dans le bassin Rhône-Méditerranée et la qualification des fonctions et pressions.* Suzanne Catteau (Agence de l'eau Rhône-Méditerranée-Corse)
- *Connecter les gens à la nature.* Ilse Geijzendorffer (Tour du Valat / Observatoire des zones humides méditerranéennes)
- *Pêches d'anguilles dans l'étang de Berre, de la Révolution industrielle à aujourd'hui.* Guy Imbert (ancien directeur de recherche du CNRS au Centre d'océanologie de Marseille - station marine d'Endoume - et ex-directeur des relations internationales à l'Université Aix-Marseille II)
- *Vulnérabilité des oiseaux marins aux changements environnementaux: l'exemple du Fou à pieds bleus aux îles Galapagos.* Larisa Lee Cruz (membre du Système national des chercheurs du Mexique)
- *La méthode des Moyens d'existence Durables (MED), une approche sociale basée sur les capitaux multiples: Utilité de l'outil MED pour la Tour du Valat et les zones humides Méditerranéennes.* Laurent Chazée (Observatoire des zones humides méditerranéennes / Tour du Valat)
- *Biodiversité et comptabilité: des synergies de recherche pour rendre des comptes sur la biodiversité ?* Laurent Mermet et Clément Feger (AgroParisTech)
- *Mise en évidence des zones humides d'importance internationales pour la conservation des oiseaux d'eau.* Nadège Poppof (Tour du Valat)
- *Comprendre, connaitre et communiquer sur les enjeux planétaires contemporains… Un défi pour l'enseignement.* Elie Gaget (Tour du Valat)
- *Enquête sociologique sur la préservation des zones humides dans le nord-est algérien.* Souhila Allaoua (Laboratoire sols et développement durable, Université Badji Mokhtar, Algérie)

Heinz Hafner Lecture

In the cycle of annual conferences on biology and conservation, which was initiated by the Tour du Valat to pay tribute to the work of Heinz Hafner on waterbird and wetlands conservation, this year we welcomed Frédéric Thomas, Research Director at the CNRS: "Ecology, evolution, conservation and cancer". This conference is available online. https://viméo.com

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. The Library is dedicated to François Bourlière (1913-1993), a pioneer in ecological conservation who was deeply committed to working with Luc Hoffmann and to the Tour du Valat.

The library's reference material, at first devoted mainly to ornithology, has been built up to include related fields of research, ecology, ethology and particularly the knowledge and the sustainable management of Mediterranean wetlands:

- 11,500 publications and thesis
- 490 different periodicals of which 60 are running
- 28,000 offprints, booklets and reports

The summaries of the last ten years for 23 periodicals (19 000 articles) have been added to the documentary resources in 2017.

A Resource Centre open to all

- 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.
- On-line since October 2016, by means of its new document portal, tourduvalat.centredoc.fr, it enables any internet user to:

- discover the most recent publications by Tour du Valat researchers;
- carry out bibliographical research in the document collect on;
- consult thematic selections of documents from the collect on;
- view summaries of journals received by the Library;
- find out about the Library's newly acquired works;
- 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 so as to be automatically informed of any new addition to the collect on that corresponds to the user's centres of interest.

Tour du Valat

- Tour du Valat Resource Centre - François Bourlière Library
  Le Sambuc - 13200 Arles
  Tél: +33 (0)4 90 97 29 76
  Email: biblio@tourduvalat org
  Document Portal: tourduvalat.centredoc.fr

Nadège Popoff,
PROJECT OFFICER

“ Remotely thanks to satellite imagery or on the field, the conservation of Mediterranean wetlands is my priority. ”

Médias

In 2017, the Tour du Valat received extensive media coverage with more than 200 articles published in the press and online, as well as 7 TV reports on national (4) and regional (3) channels, and 9 radio shows.

The following themes were the most common:

- The ringing of Greater Flamingos at the Aigues-Mortes saltworks site
- Mosquito control in the Camargue (third year of experimentations with Qista traps) with major coverage in the national economic press
- Antibiotic resistance and the role played by wildlife in spreading it
- The European Pond Turtle and the monitoring of its population on the Tour du Valat Estate (2 national television shows)
- The fish monitoring conducted on the Etangs et marais des salins de Camargue site, which was featured in a television report
- Climate change in the Camargue and in the Mediterranean
- The conferences presented by scientists from the Tour du Valat on various occasions (B. Poulin, P. Lambret, J. Jalbert, T. Galewski, Mediterranean Lagoons Transfer Unit)
- The activities of the Friends of the Tour du Valat association (seminars and photography contests)
- The events organised by the Mediterranean Lagoons Transfer Unit (World Wetlands Day in the Mediterranean, European Heritage Days in the Mediterranean, and the awarding of the Mediterranean Lagoons Transfer Unit prize on the theme of "Economy and biodiversity")
- The exciting events in 2017: Tour du Valat Open Day, the Envies Rhônements Festival, Camargue Festival, and Camargue Park Festival.
- The Camargue as depicted in various reports

The Tour du Valat 2.0!

- The Tour du Valat has decided to increase its presence on the social networks (Facebook, Twitter, Viméo…). In 2017, our publications were viewed more than 370,000 times!

The following publications were viewed and shared the most online:

- The film The Tour du Valat: where research meets nature
- Our successful ringing of Greater Flamingos
- Jean Jalbert's participation in the discussion and debate "Protecting lagoonal ponds" at a local café, and on a radio show on RFI "What's the use of wetlands?" for World Wetlands Day
- Our events (Tour du Valat Open Day, the Envies Rhônements Festival, Camargue Festival and Camargue Park Festival)
- The news and projects of our partners
- And of course, our job offerings!

To follow our news, join us on:

and visit our beautiful new Internet site!
www.tourduvalat.org

Sanae Zinouni,
ACCOUNTANT

“ Starting my career in accounting in such a team, what could be better? ”

Fieldtrip for the
Tour du Valat board

OUR ORGANISATION

The Tour du Valat is a non-profit organisation whose governance is handled by two management bodies: the Board, which is made up of three colleges – the Founders, full members, and experts, and the Science Council, composed of internationally acclaimed scientists from the major fields of wetlands research and conservation. In addition, six thematic experts (two for each of the scientific departments) provide specialised advice to support the Science Council.

In 2017, the Board's College of full members was joined by Hélène Souan, representing the French Ministry of the Environment, with which we maintain a close and highly constructive partnership.

Last year, the Board's work focused largely on anticipating the change in economic model the Tour du Valat will need to undertake in five years. This new situation will require us to adapt our strategy and system of organisation. The Board will continue to work on these changes in the next few years.

The Science Council was significantly renewed this year with the arrival of three new members: Teresa Ribeiro from the European Environment Agency, Debbie Pain, the Wildfowl and Wetlands Trust's Director of Conservation, and Wolfgang Cramer of the Mediterranean Institute of marine and terrestrial Biodiversity and Ecology (IMBE). We wish them a warm welcome and thank them for their commitment to the work of the Tour du Valat. Finally, Laurent Mermet, Professor at the ENGREF (National Institute of Rural Engineering, Water, and Forestry) became President of the Science Council, and Patrick Duncan, from the Chizé CNRS (National Centre for Scientific Research) is the Vice President.

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After these changes there is perfect parity between men and women in both of our governing bodies.

Budget

THE BUDGET FOR THE YEAR 2017 AMOUNTS TO 5, 331,000 EUROS

Expenditure

- 3,488,000 euros have been allocated to the scientific programmes, including 961,000 euros for the “Conservation of species and their populations in the context of global changes” department, 1,217,000 euros for the “Ecosystem modelling, restoration and management” department, 473,000 euros for the “Monitoring and evaluation & wetlands policies” department, 488,000 euros for the management of the estate, and 349,000 euros for shared scientific activities (scientific management, conferences, training, transfer, project development, etc.).
- 388,000 euros have been allocated to general management (including the governance of the organisation as well as the representation of the Tour du Valat in major forums) and to communication (website, annual report, etc.).
- 86,000 euros have been allocated to managing the Tour du Valat library, principally the purchase of books and scientific journals.
- 1,369,000 euros have been allocated to ancillary services, which include financial and administrative services, the canteen, building maintenance, and the repairs workshop.

Tour du Valat receives its financing from a number of sources:

- 13% from its own funds, held by the Pro Valat Foundation (704,000 €).
- 22% from partnership agreements with public organisations (1,176,000 €).
- 50% from the MAVA Foundation (2,650,000 €).
- 9% from partnership agreements with other private organisations (484,000 €).
- 6% are revenues from the estate (317,000 €).

Expenditures in euros

- Scientific programmes ..... 3,488,000 €
- General management / Communication ..... 388,000 €
- Library ..... 86,000 €
- Ancillary services ..... 1,369,000 €

Total: 5,331,000 €

Receipts in euros

- Core funds ..... 704,000 €
- Agreements with private organisations ..... 3,134,000 €
- Agreements with public organisations ..... 1,176,000 €
- Revenues from the Estate ..... 317,000 €

Total: 5,331,000 €

Governance

Our board
© Tour du Valat

BOARD

College of founders

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

College of ex officio members

- Michel Chpilevsky . . . . . Sub-prefect of Arles, representing the Home Office
- Jean-Philippe Nabot . . . . . Regional representative for Research and Technology, representing the Ministry of Higher Education and Research
- Hélène Souan . . . . . PACA Regional Directorate for Environment, Planning and Housing, representing the French Ministry of the Environment
- Hervé Schiavetti . . . . . Mayor of Arles, representing the town council of Arles

College of experts

- Gordana Beltram . . . . . President of MedWet steering committee, Ministry of the Environment and spatial planning (Slovenia)
- Antonio Troya . . . . . Treasurer, Director of the IUCN Centre for Mediterranean Cooperation in Malaga (Spain)
- Dr. Tobias Salathé . . . . . Secretary, Ramsar Senior Advisor for Europ in Gland (Switzerland)
- Thymio Papayannis . . . . . Honorary member - MedWet Senior Advisor, President of MedINA
- Clairie Papazoglou . . . . . European policies consultant for NGO (Cyprus)

SCIENCE COUNCIL

- Dr Laurent Mermet . . . . . President, ENGREF, Paris (France)
- Dr Patrick Duncan . . . . . Vice-president CNRS, Chizé (France)
- Dr Teresa Ribeiro . . . . . European Environment Agency
- Dr Debbie Pain . . . . . Wildfowl and Wetlands Trust (WWT)
- Dr Wolfgang Cramer . . . . . Mediterranean Institute for Biodiversity, Marine and Continental Ecology (IMBE)
- Pr William Sutherland . . . . . University of Cambridge (United Kingdom)

Thematic experts

In support of the Science Council, a high level of expertise will be provided by six thematic experts, two for each of the three Tour du Valat programmes, for the duration of the five-year plan.

- Dr Jacques Blondel . . . . . Centre d'écologie fonctionnelle évolutive / CNRS, Montpellier (France)
- Dr Pierre Chevallier . . . . . Institut de recherche pour le développement/CNRS, Laboratoire d'hydrosciences, Montpellier (France)
- Dr Luis Costa . . . . . SPEA / Birdlife (Portugal)
- Dr Jonathan Loh . . . . . Institute of Zoology, Zoological Society of London (United Kingdom) WWF International
- Dr François Renaud . . . . . Institut de recherche pour le développement / CNRS, Montpellier (France)
- Dr Sophie Thoyer . . . . . Sup Agro LAMETA, Montpellier (France)

Eco-responsibility, an ongoing process

Testing and implementing the solutions of the future for a sustainable world; developing concrete, operational responses appropriate to the Mediterranean context, and disseminating them extensively. Those are the guiding principles of our eco-responsible process, developed in several areas:

WASTE

- 100% of our wastewater is treated by our reed bed water treatment plant.
- 100% of our waste is sorted, with fermentable waste repurposed on-site (compost), and the rest recycled via specialised processing chains.

ENERGIES

- 50% energy savings in our buildings after they were insulated with rice straw and other bio-sourced materials.
- 87% decrease in CO2 emissions and 70% decrease in heating costs, because we now use wood, some of which is produced on the Tour du Valat Estate, instead of heating oil and natural gas.

TRANSPORT POLICY

- Facilitation of carpooling and public transport for commuting between home and work.
- Our car fleet is being optimised by decreasing the number of vehicles and purchasing fuel-efficient and low maintenance cost vehicles of the same type.
- Use of an electric service vehicle, electric and mountain bikes on the Tour du Valat Estate.
- National and international trips have been limited by prioritising the use of tele- or video-conferencing, and the use of less expensive, low-ecological-footprint means of transport.

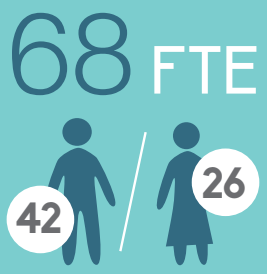
PRODUCTION AND CONSUMPTION

- We are developing an innovative agro-ecological pilot project aimed at optimising synergies between agricultural and natural habitats, limiting the consumption of water, farming inputs, and fossil energies, and testing crops adapted to the effects of climate change.
- Our herd of 350 Camargue cattle has grazed extensively, in compliance with the specifications of organic agriculture and without additional feeding or anti-parasite treatment, for 12 years. The high-quality meat produced is commercialised via a local supply chain.

- Our canteen prioritises organic, locally produced, seasonal ingredients, using short supply chains and solidarity-based economic principles. It regularly provides vegetarian meals, prohibits the use of species whose stocks are threatened, and limits and repurposes waste.
- Finally, the Tour du Valat Works Council organises the bulk purchase of cleaning products, rice, olive oil, and citrus fruit, all of which are organic.

OUR LIFEBLOOD

Our successful fund-raising activities in collaboration with A Rocha and the ANRT (national association of research and technology, Cifre grant) have enabled us to welcome a new Phd student to our team, Timothée Schwartz. We have also obtained funding for a post doctoral position for Nigel Taylor, in a partnership with the University of Cambridge. Both researchers have been given a three-year fixed-term contract.



Sanae Zinouni has also joined the accounting service, with a subsidized work contract. She will help us to better follow up on our partnership agreements.

Four European and eight civil service volunteers joined our team in 2017, providing their enthusiasm and precious assistance to the scientific team at the Tour du Valat. Three of them were hired with a fixed-term contract at the end of their mission, which proves the value of their initial experience as wetlands ambassadors. 19 dynamic, young university students also completed internships for us in 2017.

The Tour du Valat team now counts 87 employees, representing 68 full-time equivalent (FTE) positions.

Many thanks to everyone
for your commitment to the Tour du Valat and Mediterranean wetlands in 2017.

Us

Direction

- Jean Jalbert
  DIRECTOR GENERAL
- Dr Patrick Grillas
  PROGRAMME DIRECTOR
- Olivier Pineau
  DIRECTOR OF THE ESTATE
- Jean-Jacques Bravais
  ADMINISTRATIVE
  AND FINANCIAL DIRECTOR

Species Conservation department

- Dr Arnaud Béchet
  RESEARCH SCIENTIST,
  DEPARTMENT COORDINATOR
- Dr Jocelyn Champagnon
  RESEARCH SCIENTIST,
  DEPARTMENT COORDINATOR
- Dr Marion Vittecoq
  RESEARCH SCIENTIST,
  DEPARTMENT COORDINATOR
- Antoine Arnaud
  RESEARCH TECHNICIAN
- Thomas Blanchon
  RESEARCH TECHNICIAN
- Pascal Contournet
  RESEARCH TECHNICIAN
- Dr Alain Crivelli
  RESEARCH DIRECTOR
- Laura Dami
  PROJECT LEADER
- Clémence Deschamps
  PROJECT LEADER
- Benjamin Folliot, PhD
  UNIVERSITY OF MONTPELLIER,
  FUNDING ONCFS
- Christophe Germain
  PROJECT LEADER
- Yves Kayser
  RESEARCH ASSISTANT
- Dr Delphine Nicolas
  RESEARCH SCIENTIST
- Émeline Sabourin
  PhD STUDENT, UNIVERSITY
  OF MONTPELLIER (CO-FUNDING
  TOUR DU VALAT/LABEXCEMEB)
- Timothée Schwartz
  PhD STUDENT, (FUNDING CIFRE/
  ECOLE PRATIQUE DES HAUTES
  ETUDES-CEFE MONTPELLIER)
- Marie Suet
  PROJECT OFFICER

Ecosystem modelling, restoration and management department

- Dr Brigitte Poulin
  RESEARCH SCIENTIST,
  DEPARTMENT COORDINATOR
- Dr Lisa Ernoul
  PROJECT LEADER,
  DEPARTMENT COORDINATOR
- Nathalie Barré
  RESEARCH ASSISTANT
- Nicolas Beck
  PROJECT LEADER
- Dr Olivier Boutron
  RESEARCH SCIENTIST
- Olivier Brunet
  FARM MANAGER
- Julie Campagna
  PhD STUDENT, UNIVERSITY OF
  ANGERS (CO-FUNDING TOUR DU
  VALAT/UNIVERSITY OF ANGERS/
  AGENCE DE L'EAU)
- Tania de Almeida
  PhD STUDENT (FUNDING REGION
  PROVENCE ALPES COTE D'AZUR/
  UNIVERSITY OF AVIGNON)
- Nathalie Chokier
  RESEARCH TECHNICIAN
- Hugo Fontes
  RESEACH ASSISTANT
- Antoine Gazaix
  PhD STUDENT, UNIVERSITY OF
  MONTPELLIER (CO-FUNDING
  TOUR DU VALAT/SNCF
  RESEAU OC'VIA)
- Manon Hess
  PhD STUDENT,
  (CO-FUNDING CIFRE/NGE)
  UNIVERSITY OF AVIGNON
- Samuel Hilaire
  RESEARCH TECHNICIAN
- Philippe Lambret
  PROJECT LEADER
- Dr Gaëtan Lefebvre
  RESEARCH ASSISTANT,
  IT MANAGER
- Émilie Luna-Laurent
  RESEARCH TECHNICIAN
- Virginie Mauclert
  PROJECT LEADER
- Dr François Mesléard
  RESEARCH DIRECTOR
- Cannelle Moinardeau
  PhD STUDENT, UNIVERSITY OF
  AVIGNON (CO FUNDING COMPA-
  GNIE NATIONALE DU RHÔNE)
- Marc Thibault
  PROJECT LEADER
- Loïc Willm
  RESEARCH ASSISTANT
- Nicole Yavercovski
  RESEARCH ASSISTANT

Mediterranean Wetlands Observatory Department

- Dr Ilse Geijzendorffer
  RESEARCH SCIENTIST,
  DEPARTMENT COORDINATOR
- Dr Patrick Grillas
  DEPARTMENT COORDINATOR
- Dr Laurent Chazée
  PROJECT LEADER
- Sara Fraixedas
  POST-DOCTORAL RESEARCHER
- Élie Gaget
  PhD (TOUR DU VALAT/
  MUSE UM NATIONAL D'HISTOIRE
  NATURELLE)
- Dr Thomas Galewski
  PROJECT LEADER

The Tour du Valat team with the Board and the Science Council
© Tour du Valat

- Anis Guelmami
  RESEARCH ASSISTANT
- Clément Merle
  PROJECT OFFICER
- Dr Christian Perennou
  PROJECT LEADER
- Nadège Popoff
  PROJECT OFFICER
- Dr Alain Sandoz
  RESEARCH SCIENTIST
- Nigel Taylor
  POST-DOCTORAL RESEARCHER

Estate management

- Olivier Pineau
  DIRECTOR OF THE ESTATE
- Damien Cohez
  DEPUTY DIRECTOR OF THE ESTATE
- Julien Bourjaillat
  GARDIAN
- Cyril Caillat
  ESTATE TECHNICIAN
- Cédric Cairello
  ESTATE TECHNICIAN
- Frédéric Castellani
  ESTATE TECHNICIAN
- Dimitri Gleize
  ESTATE TECHNICIAN
- Marion Lourenço
  TECHNICIAN – GUARD
- Yannick Michelier
  ESTATE TECHNICIAN
- Ludovic Michel
  ESTATE TECHNICIAN
- Anthony Olivier
  TECHNICIAN – GUARD

Support services

- Anne Ackermann
  EXECUTIVE SECRETARY
- Muriel Arcaute-Gevrey
  FRIENDS OF TOUR DU VALAT ASSOCIATION MANAGER
- Nicole Bonfils
  ACCOUNTANT
- Barbara Comabella,
  CLEANING OFFICER
- Corinne Cuallado
  COOK
- Florence Daubigney
  EXECUTIVE SECRETARY
- Marie-Antoinette Diaz
  SECRETARY
- Kamel El Bachir
  ACCOUNTANT
- Roberta Fausti
  LIBRARIAN
- Rosalie Florens
  EXECUTIVE SECRETARY
- Cécile Girard
  CLEANING OFFICER
- Stéphanie Gouvernet
  CLEANING OFFICER
- Coralie Hermeloup
  COMMUNICATION MANAGER
- Claudia Mihai
  CLEANING OFFICER
- Johanna Perret
  EXECUTIVE SECRETARY
- Jean-Claude Pic
  CHIEF ACCOUNTANT
- Justine Sanchez
  CLEANING OFFICER
- Josiane Trujas
  CANTEEN ASSISTANT
- Gwenael Wasse
  COMMUNICATION OFFICER
- Sanae Zinouni
  ACCOUNTANT

Students

- Soukaina Anougmar, Solène Baillet, Clara Bertrand, Morgane Charaix, Nicola Chericoni, Clément Combettes, Mattéo Darienzo, Yseult De Dreuille, Arnaud Guille, Maëlys Marage, Stephen Mulero, Blandine Pin, Sélim Sotha, Amandine Thomas, Hoang Ha Tran.

European Voluntary Service

- Hugo Ferreira, Sofia Lopes, Sonya O'Laughlin, Lauren Redmond.

Erasmus

- Irène Badone, Kim Ferjancic, Lina Lopez Ricaurte.

Erasmus+

Civic services

- Erika Audry, Anne-Sophie Hervy, Florian Leborne, Carole Leray, Camille Muranyi-Kovacs, Nadège Popoff, Charlotte Ravot, Corentin Rollet.

SERVICE CIVIQUE

Fixd term contracts (short period)

- Coralie Beltrame, Claire Bignon, Gabriel Caucal, Kristell Dever, Sophie Guingand, Anne-Sophie Hervy, Kévin Huppert, Florian Le Borne, Sybille Le Meur Tiné, Lisa Paix, Ana-Elena Sanchez de Dios Rodriguez.

To join us

In order to help the Tour du Valat to continue its actions for the common good, we need your support. There are several ways to provide it.

FRIENDS OF TOUR DU VALAT ASSOCIATION

Friends of Tour du Valat

The association was founded in 2014, on the occasion of the 60th anniversary of the Tour du Valat, in order to bring together the fabulous human capital built up over the years by all those who have made the Tour du Valat what it is, and more broadly all those who share our values and the sense of our actions. Its aim is to provide exchange and knowledge-sharing, and to promote the work of the Tour du Valat.

All you have to do to join us is to go to our new website:

https://amistourduvalat.org/en/adherer/

or contact us for further information at:

amis@tourduvalat.org / amistourduvalat

SPONSOR A GREATER FLAMINGO

By sponsoring one or more banded flamingos, you will support the "Greater Flamingo Network" and be involved in protecting the species at pan-Mediterranean scale.

Sponsoring costs 25€ per flamingo per year. This sum is entirely dedicated to buying optical equipment such as binoculars and telescopes to be given to our partners

in the south and east of the Mediterranean Basin so that they can contribute to monitoring flamingos throughout their range.

On becoming a sponsor you will be informed of the movements of "your" flamingo all through the year, and whether it bred successfully. Each time an observation of your flamingo is communicated to us, you will be informed by email and will be able to consult the records of its movements on an interactive dynamic map and in the form of a table.

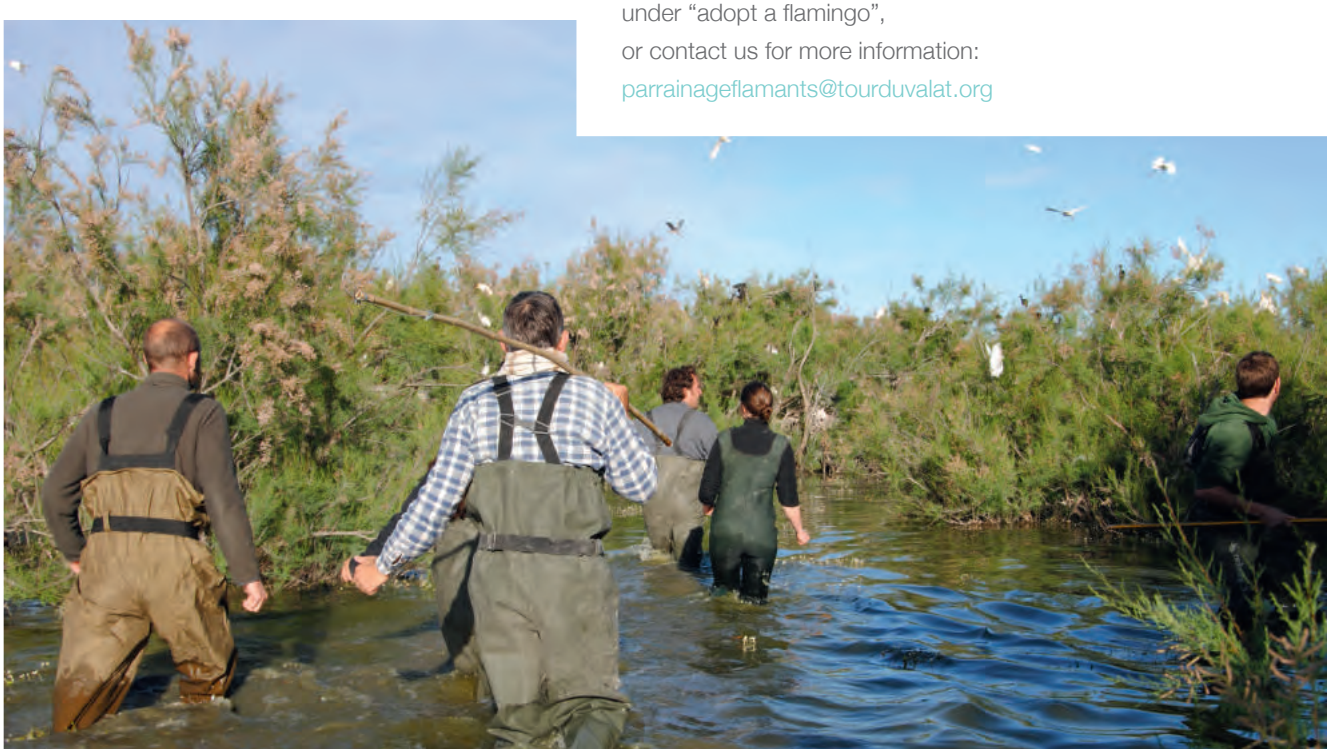
If you sponsor two flamingos (2 X 25€) it will only really cost you 17€ after tax deduction.

You can subscribe via the website:

www.tourduvalat.org/support
under "adopt a flamingo",

or contact us for more information:

parrainageflamants@tourduvalat.org



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© Jean E. Roché

MAKE A GIFT

Gifts enable us to continue and intensify our research work to conserve the biodiversity of Mediterranean wetlands and encourage the wise use of their natural resources.

To make a gift just download the gift form (.pdf) available on our website:

www.tourduvalat.org/support

and send it to us together with your payment.

MAKE A DONATION OR BEQUEST

Because the Tour du Valat's values are dear to you, and you appreciate the quality and independence of its work, you can act on a long-term basis and help us to shape its future by making a donation or bequest to the Tour du Valat Foundation. Again, you will benefit from tax rebates. Don't hesitate to contact us for further information:

partenariat@tourduvalat.org

TAX-DEDUCTIBLE SUPPORT

The Tour du Valat Foundation is recognised as being of public interest and therefore authorised to receive gifts of money. 66% of your gift is tax-deductible up to the limit of 20% of your taxable income. A gift of 100 € will thus only really cost you 34 € after tax deduction.

THE PETIT SAINT-JEAN ESTATE

Thanks to the generosity of Mr Bernard, the Tour du Valat has become the owner of an estate in the Gard whose total area of 101 hectares includes a remarkable pine wood (50 ha), marshes (24 ha), and agricultural land (26 ha). In keeping with the spirit of its donor, Tour du Valat is using the site for an agro-ecological partnership project aimed at developing a productive, sustainable, resilient and autonomous agricultural system based on synergies with natural habitats.

Julien Bourjaillat,
GARDIAN

“ It's a chance to make a living out of one's passion, and what is more, in such wonderful surroundings! ”

© H.Hôte

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

NATIONAL PARTNERS IN FRANCE

- Ministère de la Transition Écologique et Solidaire (Ministry of Environment)
- Ministry of Agriculture and Alimentation
- Rhône-Mediterranean and Corsica Water Agency
- French Biodiversity Agency (AFB)
- French Development Agency (AFD)
- ANRT – Association Nationale Recherche Technologie
- CNRS – French National Research Centre

TERRITORIAL PARTNERS

- Provence-Alpes-Côte d'Azur Region
- Bouches-du-Rhône Departmental Council
- Camargue Regional Natural Park

Our 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, helping it celebrate World Wetlands Day and supporting its communication campaign that aims to promote events in Mediterranean lagoon territories. Its employees also participate every year in a project that promotes wetlands.

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

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

EcoDDS is a non-profit-purpose company, which mission is to foster recycling, to collect and deal with various chemical wastes for individuals. For the next three years, it engaged in the conservation of the European Roller and will support Timothée Schwartz's dissertation. This thesis aims in particular at improving the deployment of artificial nesting boxes, which is the main conservation measure used to protect this species.

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, which aims to develop a showcase site for permaculture, with the of planting berry hedges and digging ponds, to create a model for the farming of tomorrow.

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.

The Gecina Foundation provides support for the Résifaune Health Ecology project, which aims to improve our understanding of the role played by wildlife in the circulation of antibiotic-resistant bacteria by studying those carried by rodents and gulls in different habitats in the Camargue..

The inauguration of the sponsors aera
© H.Hôte

The “Helping hand” programme sponsored by the Nature et Découvertes Foundation provided funding for a project to fit Eurasian Spoonbills with GPS tags. This project was carried out with the school in Le Sambuc (commune of Arles), and will follow their migrations to sub-Saharan Africa.

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..

Continuing our partnership initiated ten years ago, this year the Total 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 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.

The Klorane Botanical Foundation and the Tour du Valat Foundation are both the work of visionaries committed to a harmonious relationship between Humanity and Nature: Pierre Fabre and Luc Hoffmann who knew and appreciated each other. The two foundations have a joint project to collaborate on two plant species : the searocket (a medicinal plant) and the *Lythrum thesioides* (an extremely rare species).

In the aim of preserving a very rare plant species, *Lythrum thesioides,* which has been identified at only two sites in the Gard, a partnership was created with OC’VIA (construction company) and the SNCF (train company) to fund a doctoral thesis on the ecology of this species. This project falls within the framework of the measures accompanying the construction of a high-speed train line.

In 2017, VINCI Autoroutes (ASF south of France motorway network) signed a three-year partnership agreement with the Tour du Valat, which is intended to support its Mediterranean Lagoons Transfer Unit in order to promote Mediterranean lagoon habitats for the employees and users of this motorway network.

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.

Hosted Organisations

The Tour du Valat is hosting five partner organisations in its premises.

Friends of Tour du Valat Association

Friends of
Tour du Valat

The association has been created for the 60th Anniversary of the foundation and links many an employee, intern, partner be it private or public, friend, who share the values and the philosophy of Tour du Valat. Its goal is to unite, advance, promote and support the action of the foundation through this vast network of people linked professionally as well as personally.

Find out more: https://amistourduvalat.org

MedWet Secretariat

MedWet

The MedWet initiative is composed of 26 partner countries in the Mediterranean basin and Palestine. Its mission is to promote the implementation of the Ramsar Convention's objectives and initiatives in the Mediterranean region. Since 1992, MedWet has been encouraging partnerships in order to ensure and support a rational use and an efective conservation of wetlands. In 2014, at the invitation of the French Government and with the support of the Rhône Mediterranean Corsica water agency and Fondation MAVA, the MedWet secretariat has been relocated at Tour du Valat, and works closely with the Mediterranean Wetlands Observatory.

Find out more: www.medwet.org

Association Caribaea Initiative

CARIBAEA
INITIATIVE

The association "Caribaea Initiative" aims at contributing to the development of scientific research on biodiversity and wildlife management at the scale of the Antillean arc. Created in October 2014, the association acts to strengthen the scientific expertise capacity on animal biodiversity in the Caribbean and to support the training of future local experts, through master and PhD grants.

Find out more: www.caribaea.org

National Office for Hunting and Wildlife (ONCFS)

Office National
de la Chasse
et de la Faune Sauvage

The French National Office for Hunting and Wildlife (ONCFS) is a public organisation employing 1,700 officers. Its twofold mission is to conduct studies and research on wildlife and their habitats and to ensure compliance with the laws and regulations on nature and hunting. The offices of the ONCFS at the Tour du Valat accommodate two units of the Centre National d'Etudes et Recherches Appliquées (CNERA), one of which is devoted to the smaller resident plains fauna and the other to migratory birds.

Find out more: www.oncfs.gouv.fr

Association TAKH

TAKH

Through the safeguard and study of the Przewalski horse as a flagship species, Association Takh leads a pilot conservation project which allies steppe and wetland restoration, as well as endangered species protection, to the promotion of sustainable development, on Khomyn Tal in Mongolia.

Find out more: www.takh.org

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:
  33 695 907 048
- 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
- Follow us on:
  @TourduValat
  Tour du Valat
  www.tourduvalat.org

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Pure impression
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Le Sambuc - 13200 Arles - France
Tél. : + 33 (0)4 90 97 20 13
Fax : + 33 (0)4 90 97 20 19
secretariat@tourduvalat.org
www.tourduvalat.org

Tour du Valat