ACTIVITY REPORT 2016

TOUR DU VALAT

Tour du Valat

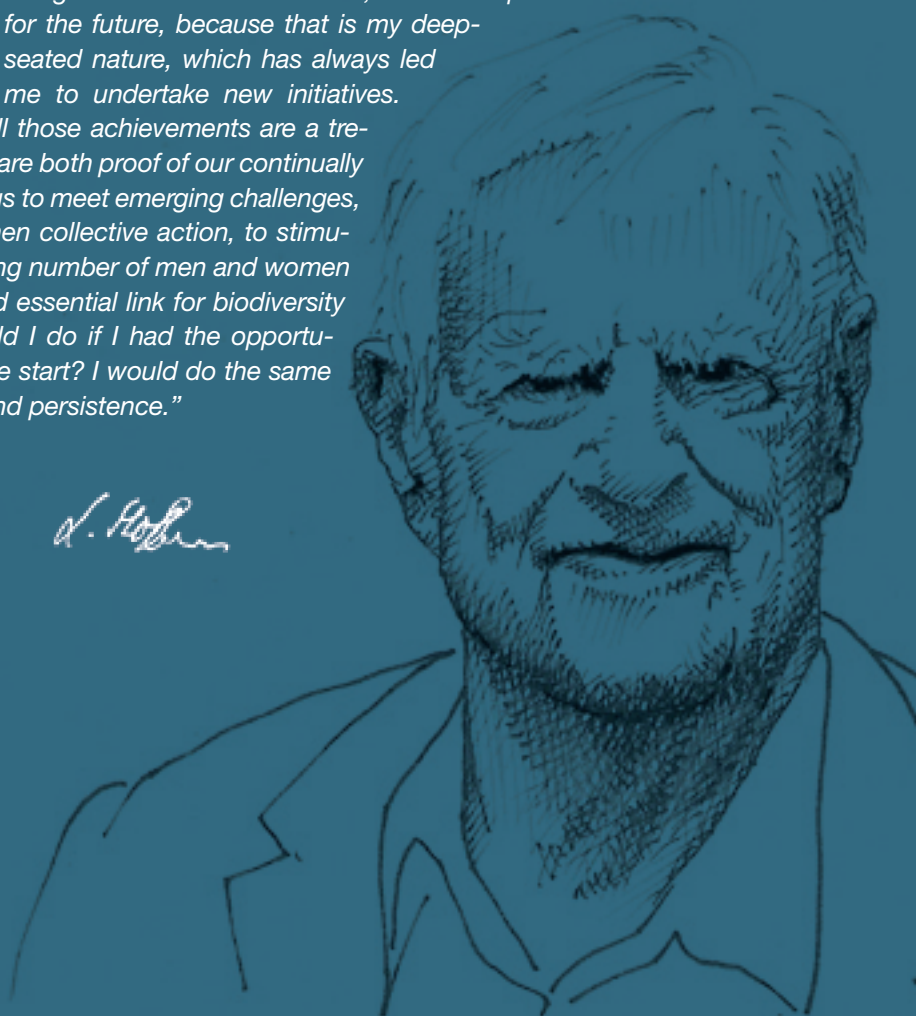
Research institute for the conservation of Mediterranean wetlands

Luc Hoffmann

Luc Hoffmann (1923-2016), founder of the Tour du Valat, passed away on 23 July 2016 in the Camargue, in the very place he chose to live 70 years ago, where he founded his family and launched many initiatives for a more peaceful relationship between Man and Nature. An emblematic and respected figure in the world of ecology, his vision, tenacity, and flawless commitment have had a considerable impact on nature conservation throughout the world..

"When I discovered the Camargue at the end of World War II, it was an emotional shock, and the beginning of an unquenchable passion for this remote area. Two years later, when I had the opportunity to purchase an estate made up of farmland, vast marshes, and sansouires, at a place called "Tour du Valat", I was a long way from imagining the developments this adventure would entail…/…

Despite the numerous positive results obtained by conservationists, and wetlands environmentalists in particular, the situation is continuing to worsen. Nonetheless, I remain optimistic for the future, because that is my deep-seated nature, which has always led me to undertake new initiatives. But also and especially because all those achievements are a tremendous asset for the future. They are both proof of our continually renewed expertise, which enables us to meet emerging challenges, and an encouragement to strengthen collective action, to stimulate the commitment of an increasing number of men and women for wetlands to remain the vital and essential link for biodiversity and human well-being. What would I do if I had the opportunity to relive this adventure from the start? I would do the same thing... with twice as much effort and persistence."



ACTIVITY REPORT 2016

TOUR DU VALAT

A word from the president

Transmit. Pursue and develop the vision of our father, founder of the Tour du Valat, beyond his existence.

That is the commitment my sisters and I took well before our father, Luc Hoffmann, passed away in the Camargue in the summer of 2016.

Among his numerous achievements, the Tour du Valat is certainly the one that counted the most for him, the one that started everything.

This singular adventure began over 60 years ago with the establishment of a biological station intended to help scientists better understand the relations linking living organisms in the Camargue. Guided by his powerful vision and demanding humility, my father knew how to catalyse energies and skills, to create interfaces between disciplines, build bridges between science and management, and push forward action.

Today, the Tour du Valat is an internationally acclaimed institution guided by the necessity to achieve efficiency. It strives to optimise its impact based on an original position in the field, with a very well-targeted objective – the conservation and wise use of wetlands in the Mediterranean Basin –, through a wide range of actions, devoted to providing concrete responses for key issues: generating knowledge and sharing it to build the capacity of those involved, and contributing to the effective management of these habitats while informing public policy.

Yet beyond its reputation or references, the Tour du Valat's principal strength resides in the network of women and men who share the same values and vision, thus creating the links for a community of action. This community, which is active in the Camargue, the Mediterranean Basin and well beyond, is Luc Hoffmann's legacy.

During a beautiful summer day, under the plane trees in the courtyard at the Tour du Valat, some eight hundred people gathered to pay a warm and delicate tribute to Luc Hoffmann. The directors of international nature conservation organisations and Camargue herders, researchers and artists, Camargue farmers and Mauritanian officials, unknown people and celebrities all expressed in different ways the same feeling of gratitude toward him. With small subtle strokes, they painted the portrait of a humble and courageous man, an adamant visionary, an honest and generous nature enthusiast, who was attentive to everyone and to each person individually. They all also expressed the pressing need to continue and further develop the actions initiated by my father.

It is with a great deal of emotion that I felt this energy and understood that the torch had been passed on. That this community was moving forward. That henceforth we must actively relay our knowledge and mobilise more individuals and organisations, so that nature, and wetlands in particular, can continue to be the foundations of our existences, the essential link that obliges us.

André Hoffmann
PRESIDENT OF THE TOUR DU VALAT FOUNDATION

Florian Leborne,

CIVIL SERVICE MISSION IN THE SPECIES DEPARTMENT

“ Participating in scientific fishing operations that highlight the utilisation of habitats by wetland ichtyofauna with the guidance of experienced researchers and technicians at the Tour du Valat—is there any better way for someone passionate about nature to learn and improve their knowledge? ”

Contents

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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 around eighty 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.

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

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).

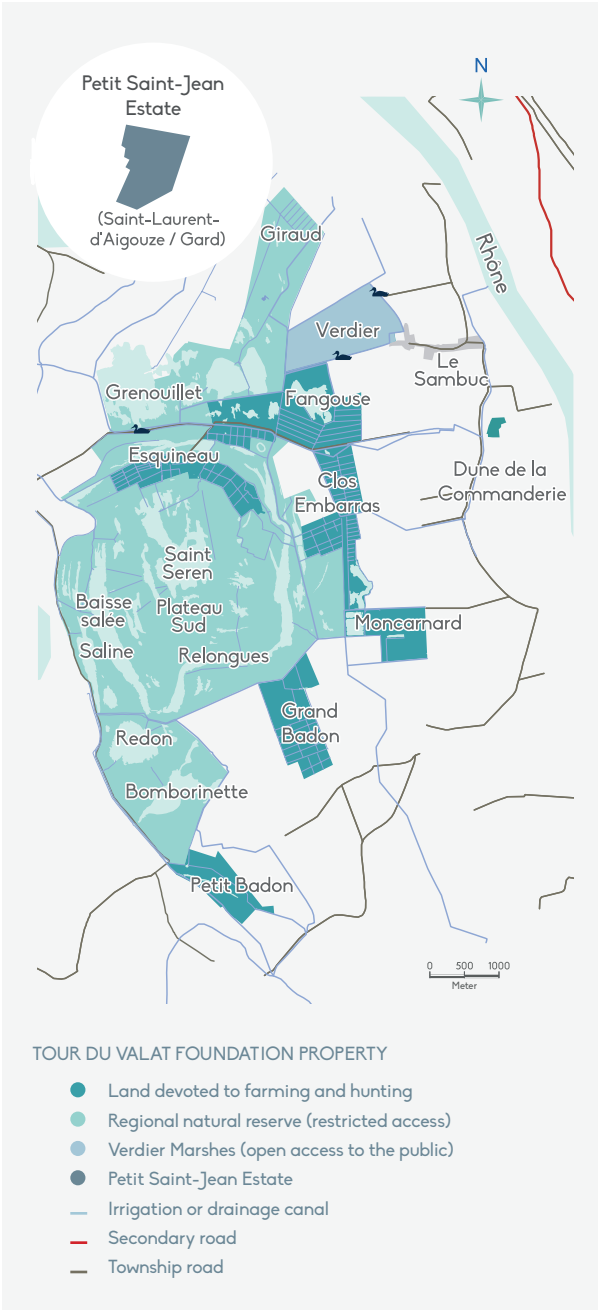
3 - MAINTAINING TRADITIONAL ACTIVITIES

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 2016, 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

Baillon's crake
Porzana pusilla
©M.Thibault

Biodiversity on the Tour du Valat estate is expressed very differently according to the climatic and hydrological conditions. Overall, 2016 was rather dry, with little rain in the winter and with a very strong drought at the end of the year. These conditions proved to be quite unfavourable for the breeding and wintering of waterbirds, aquatic plants, as well as amphibians (the most unfavourable year since the beginning of the tadpole monitoring of a sample area in the ponds). Nonetheless, we still made some interesting discoveries and observations on the estate.

Réserve Naturelle Régionale
TOUR DU VALAT

NESTING PASSERINE COUNTS

This monitoring, which was initiated in 1995, consists in counting singing passerines at 20-minutes listening points, which are 500m apart and cover the entire site. Initially conducted every five years, the time step was reduced to three years in 2010. These counts enable passerine communities to be monitored on our site, and this year 70 different species for an estimated total of 2,300 pairs were observed. The three most abundant species were the Common nightingale *(Luscinia megarynchos),* the Eurasian skylark *(Alauda arvensis),* and the Cetti's warbler *(Cettia cetti).* It was a remarkable season for the Fan-tailed warbler *(Cisticola juncidis),* the Sardinian warbler *(Sylvia melanocephala),* the Melodius warbler *(Hippolais polyglotta),* and the Tawny pipit, which numbers corresponded to a 21-year record. On the contrary, the numbers of Carrion crows *(Corvus corone),* Western jackdaws *(Corvus monedula),* Mapgies *(Pica pica),* and Eurasin tree sparrows *(Passer montanus)* have continued to decrease.

COLLARED PRATINCOLE ACTION PLAN

The facilities installed on the Moncanard land to attract Collared pratincoles were once again very effective. Crops were not grown on two parcels, but they were nonetheless partially tilled. In addition, since the sorghum did not grow on the cultivated parcels, there were ultimately 20 ha of land that offered favourable conditions for the species. At least 26 pairs tried to breed (31 % of the total number in France), and 36 juveniles left their nests.

FAVOURABLE CONDITIONS FOR RARE AND PROTECTED PLANTS

Kickxia commutata is a pretty plant that is protected in France. It was known on the Campouceu and Férigoulet sites, where a specimen has always been found. This year it was abundant in the grasslands and rushes at the Cabane rouge (more than 100 individuals) and Ferigoulet (more than 1000 individuals) sites.

Another plant that is protected in France, the *Pulicaria sicula,* grows in temporary marshes. Observed especially on the Cerisières moyennes site, it has also been found at other places (Faïsses and Giraud), which confirms the great importance of the site to preserve this rare and threatened plant.

Field research with the CBN (National Mediterranean Botanical Conservatory) confirmed the presence of Caryophyllaceae *(Cerastium siculum)* and its distribution was specified. The species is definitely present on the Cabane rouge and Redon fossil dunes.

The relative humidity of the ponds permitted Bird's-foot clover *(Trifolium ornithopodioides)* to thrive. The species was thus found in five sectors in the Cerisières.

NEW OBSERVATIONS OF HARES AND EUROPEAN WILD RABBITS

Despite some promising spring observations, notably in the sectors of the Regional Natural Reserve, where they had no longer been observed, the number of European wild rabbits *(Oryctolagus cuniculus)* remained as low as ever. Indices of abundance for the last nocturnal counts were between 0.6 and 1.3 rabbits per km.

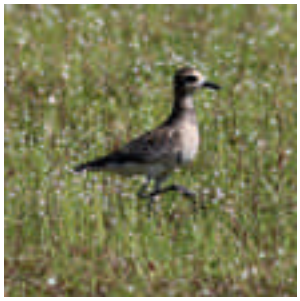
Some European hare *(Lepus europaeus)* were observed in 2016, however, we cannot conclude that this signifies a return of the species to the site (it really disappeared in the early 1990s). These observations are probably due to hares that were released on nearby hunting estates.

A REMARKABLE SPECIES OF BUTTERFLIES

New species of this group, which was well studied in the 1950s and 60s, are rarely observed. It is rather the opposite, because many of the taxa mentioned 40 years ago are no longer present. The first observation on the site of the Southern comma *(Polygonia egea)* is therefore remarkable, all the more since this species is considered to be endangered and on the IUCN Red List of rhopalocera in metropolitan France.

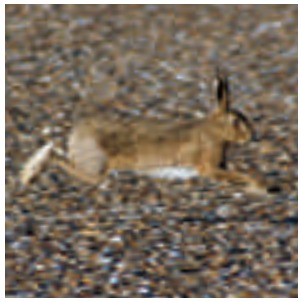
OBSERVATIONS OF SOME RARE BIRD SPECIES

Just for the record, several observations of rare bird species were also made. A Black-winged pratincole *(Glareola nordmanni)* stopped for a couple of days in the colony of Collared pratincoles. A Green-winged teal *(Anas carolinensis),* the American equivalent of our Common teal, was in the Saint Seren marsh until mid-March. A Black-shouldered kite *(Elanus caeruleus)* was spotted in July on the lands of Fangouse. In the autumn, a Pacific golden plover *(Pluvialis fulva),* a Dusky warbler *(Phylloscopus fuscatus),* and an Indian rosefinch *(Carpodacus erythrinus)* strayed at the site. Finally, as everywhere in Western Europe, the Yellow-browed warbler *(Phylloscopus inornatus)* is now spotted regularly, some twenty observations were made of at least 14 different birds.



Pacific golden plover
Pluvialis fulva
© T.Galewski

Mediterranean fluellen
Kickxia commutata
© D.Cohez



Hare
Lepus europaeus
© T.Galeswki

Black-winged pratincole
Glareola nordmanni
© M.Thibault

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OUR PROGRAMME

Tour du Valat redefines its programme every five years to develop new fields, adapt the way it undertakes its activities, and provide concrete responses to emerging issues. 2016 was the first year in our new programme, which aims to address the following challenges:

- develop advocacy for the conservation and sustainable use of wetlands in the Mediterranean Basin;
- Develop new modalities to reinvest in the southern and eastern Mediterranean taking into account the institutional instability in the region;
- strengthen synergies between conservation stakeholders;
- develop our support for the emergence and capacity building of Non-Governmental Organisations (NGO) engaged in the protection of wetlands in Mediterranean countries.

To meet these challenges, in 2016 we played a catalyst role, bringing together some forty organisations from around the Mediterranean Basin, NGOs, research organisations, intergovernmental organisations, and donors. Together we discussed the most relevant responses in a situation marked by long-term political and institutional instability and the weakening environmental preoccupations in political agendas. The response was the creation of a Mediterranean Wetlands Alliance, which today includes more than 20 NGOs and research organisations from 12 different countries. This Alliance intends to contribute to the objectives of MedWet, the Mediterranean initiative for wetlands, by mobilising the Mediterranean civil society through innovative approaches and promoting best practices as catalysts for change.

With this new programme, the strengthening of activities in the Mediterranean region and our support for partners have become more important. Likewise, our partnership with the Society for the Protection of Prespa (Greece) has become stronger with the launching of a new programme for managing reed beds, which are important for Pelican breeding and more generally for ecosystem functioning. The Tour du Valat also participates actively in the conception of wetland conservation and biodiversity projects throughout the Mediterranean Basin within the framework of the MAVA Foundation strategy. With MedINA (Mediterranean Institute for Nature and Anthropos), we will focus on two essential issues in the Mediterranean region: conservation of natural and cultural diversity.

In the Camargue, our projects in 2016 were marked by the development in two complementary directions of wetlands management and restoration research and overarching research at different geographic and temporal scales. Our field work enables us to understand the mechanisms at play, and to verify and test out hypotheses. These findings are then used in our interpretation of the global trends observed (Mediterranean Wetlands Observatory, species population dynamics...). The restoration project of the former Giraud salt works site (6500 ha) and the testing of alternative methods to fight against the nuisances caused by mosquitos illustrate the Tour du Valat's strategy perfectly: provide scientific expertise to our partners and decision-makers in order to improve the condition of wetlands and ensure they will be managed sustainably.

The different researchers on our team work increasingly with interdisciplinary objectives, which has enabled us to develop new approaches and find innovative solutions to complex wetland management issues. Modelling is the catalyst behind these interdisciplinary synergies, with a central role played by hydrological modelling, which is linked to various innovative approaches such as heath ecology.

Finally, three Ph.D. dissertations were defended in 2016 — the first on ducks and rice fields, the second on how nurseries for chicks are formed by colonial water birds, and the third on the behaviour and mating strategies of the Greater flamingo. A new dissertation project has been undertaken on the conservation management and restoration of populations of *Lythrum thesioides,* a plant that is very rare in temporary ponds.

Jean Jalbert
DIRECTOR GENERAL

Patrick Grillas
PROGRAMME DIRECTOR

Ilse Geijzendorffer,

RESEARCH SCIENTIST IN THE MEDITERRANEAN WETLANDS OBSERVATORY DEPARTMENT

“ Is there a better way to convince people that we need to ensure the future of Mediterranean wetlands than letting nature speak to them directly? I translate observations of biodiversity into indicators and messages people can understand and use. ”

SPECIES
DEPARTMENT

Species conservation

© D.Nicolas

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.

In 2016 Arnaud Béchet temporarily transferred his role as department head to Jocelyn Champagnon and Marion Vittecoq. They have been coordinating the team together, while Arnaud has been preparing his thesis for an accreditation to direct research (HDR), which he will defend in 2017 in Montpellier. Our team was also rejuvenated in October with the arrival of Florian Leborne and Carole Leray, who are completing their civil service mission with us for one year, and provide their youthful energy and precious assistance to all of our monitoring activities. Their assistance has been of particular benefit to our work on health ecology, which has enabled us to discover new information on the role played by wildlife in the emergence of antibiotic resistance. Marion gave a talk on this topic at the conference on antibiotic resistance organised in December, which brought together for the first time ever the Ministries of the Environment, Agriculture and Health.

At the end of the year, two PhD students left us after having brilliantly defended their thesis. Charlotte Francesiaz presented her research on the habitat selection and spatial-temporal dynamics of colonies of two species of gulls (Laridae), the Black-headed gull and the Slender-billed gull. Meanwhile, Charlotte Perrot analysed individual variations in the reproductive traits of the Greater flamingo, from mating to when chicks leave their nest. This second issue, reported on in the zoom on page 20, was written up in an article published in Nature's Scientific Reports, which received widespread media coverage because the results were also published in the New York Times.

Indifferent to this notoriety, not all of the greater flamingos moved to the new islet built in 2015 on the Fangassier lagoon (Life + MC SALT project). They preferred the former islet, which is now linked to the dyke and accessible to terrestrial predators. The colony abandoned the former islet due to the incursions of at least two foxes, which resulted in the total failure of the breeding of this species this year. However, thanks to the long life expectancy of flamingos and the numerous other colonies in the Mediterranean, this failure does not undermine the good conservation status of the species.

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The species team

LEFT TO RIGHT, TOP TO BOTTOM:

Lina Lopez Ricaute, Nicola Chericoni, Matteo Darienzo, Florian Leborne, Kim Ferjančič, Delphine Nicolas, Thomas Blanchon, Marion Vittecoq, Yves Kayser, Alain Sandoz, Laura Dami, Antoine Arnaud, Christophe Germain, Clémence Deschamps, & Kevin Huppert.

MISSING:

Arnaud Béchet, Jocelyn Champagnon, Pascal Contournet, Alain Crivelli, Benjamin Folliot, Charlotte Francesiaz, Claire Pernollet, Charlotte Perrot & Émeline Sabourin.

In this same sector of the former Salin-de-Giraud salt works, monthly monitoring of fish populations was launched and is being coordinated by Delphine Nicolas. It will also help to monitor the effects of reconnecting the brackish lagoons with the sea after the end of the salt farming activities there.

Finally, the interest of the Mediterranean waterbird counting network was strengthened by the publication of the first simultaneous inventories in North Africa in the journal Biological Conservation. The network was very active in 2016. It organised several workshops and continued to consolidate its database derived from censuses in North Africa in order to continue its studies on waterbird population trends through a concerted approach.

Arnaud Béchet, Marion Vittecoq
and Jocelyn Champagnon
HEADS OF DEPARTEMENT

SPECIES PROJECTS

© S.Befeld

1 - Population dynamics in response to human activities

Arnaud Béchet / bechet@tourduvalat.org

Three main activities are 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.

We are continuing our long-term studies on numerous species: 2352 individuals were ringed, marked or identified in 2016. This included Slender-billed Gulls, White spoonbills, Glossy Ibises, European pond terrapins, marble trout, European eel, and Western Spadefoot toads.

Thanks to this monitoring, this year for the first time since the beginning of the monitoring in 1997, we observed the migration of two female European pond terrapins between the two main populations that had up until then been isolated on the Tour du Valat estate.

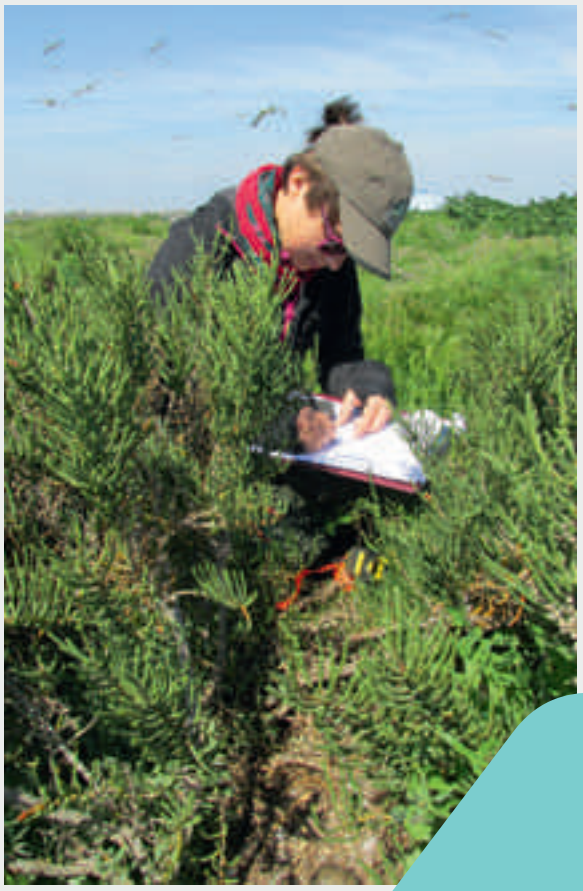
We are now the coordinators of the international network for White spoonbills. By fitting two birds with a GPS/GSM tag in the spring of 2016 in the Camargue, we were able to monitor a male adult that wintered in the south of Spain and a juvenile female that remained in the Camargue all winter. By continuing this kind of tagging, we hope to better understand the factors that influence their migratory choices.

The experimentation of restocking eel in the Vigueirat marshes in the Camargue was concluded after eight years of research. The results were reported on in a brochure published in collaboration with the Association Migrateurs Rhône Méditerranée (Rhône-Mediterranean Migratory Fish Association) and the Friends of the Vigueirat Marshes Association.

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.



© M.Vittecoq

In 2016, we combined our expertise on antibiotic resistance with a study of the literature on this question to publish a paper on the current state of knowledge on the role of wildlife in the emergence of antibiotic resistant bacteria. In parallel, we monitored over time and space the contamination of a colony of Yellow-legged Gulls by antibiotic resistant bacteria to better understand the mechanisms and paths of transmission concerned. Isolated strains are currently being studied.

We are also continuing our study of fasciolosis, a bovine disease that can be transmitted to humans, on the Tour du Valat estate. During the 2016 sampling session, liver flukes were collected from the 58 bulls slaughtered from the Tour du Valat herd. During the same period of time, more than 200 fresh water snails serving as intermediary hosts were collected. Genetic analyses were conducted on these snails and liver flukes to determine if the parasites found in the bulls come from a single population or several different sources.

Mark Gillingham, who is based at the University of Ulm (Germany), is carrying out a study aiming to better understand the interactions between the immune system of Greater flamingos through one of its principal components, the major histocompatibility complex (MHC) and all the microorganisms carried by these birds, called the microbiome. In 2016, these studies helped to better describe the species' MHC, and were written up in two scientific articles. This work also helped to develop a method for analyzing the bioaccumulation of heavy metals in feathers.

3 - Modelling and monitoring wetland biodiversity

Jocelyn Champagnon / champagnon@tourduvalat.org

The 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.

The following elements are studied in the framework of this project:

- **In the Camargue:** wintering ducks, vertebrate communities found at the Tour du Valat, and waterbird breeding (Tree-nesting herons, and colonial Charadriiformes in the framework of the European LIFE +ENVOLL programme);
- **In the Mediterranean:** the community of waterbirds in the framework of the Mediterranean waterbird network project, which involves five North African countries (Algeria, Egypt, Libya, Morocco, and Tunisia).

After engaging in considerable work to improve the quality of the data, the bird counting database for mid-January in North Africa is now uniform and consistent, which facilitates its use for study purposes. Trends in the abundance of the species and communities are currently being analysed. Two workshops could be organised in Oran and Arles in 2016, thanks to funding given by the Critical Ecosystem Partnership Fund (CEPF).

The AEWA's African Initiative Technical Support Unit (African-Eurasian Migratory Waterbird Agreement) organised (i) a workshop on how to implement management plans on key sites for migratory waterbirds, (ii) a training session on how to manage waterbird census data, (iii) a solid partnership for surveys in Lake Nasser (Egypt), (iv) a network linking the three international universities that study African wildlife species and the inclusion of waterbird training kits in their programme. In addition, a training CD focusing on waterbird identification and counting was updated in four languages, thus covering all of the regions in Africa.

Closing workshop in Oran for the North African regional waterbird monitoring and wetlands conservation project with the support of CEPF
© A.Bellaza & I.Benzina

- Modelling the dynamics of pathogenic agents

Influenza A viruses (VIA) that cause avian flu are transmitted within waterbird populations between individual and via their environment, particularly by drinking contaminated water. To understand the development of VIA in wetlands in the Camargue, we have modelled it using data obtained from bird counts, virological studies carried out between 2009 and 2011, and hydrodynamic models. We were thus able to simulate the distribution of VIA in the delta during a wintering season according to different scenarios. This tool, which will be fine tuned in 2017, will contribute to optimising the surveillance of avian flu in the region and to informing decision-makers if a health crisis occurs.

©J-E.Roché

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.

©Clara Belleville

Our platform for managing data from waterbird counts (Medwaterbirds.net) has been chosen by Tunisia, Algeria, Libya and France for managing their waterbird counting data in the Mediterranean. Kevin Huppert was recruited to develop an Internet module that can manage the ringing and visual identification data of all bird species. With the help of this tool, observers will be able to gain access much more rapidly to the histories of the birds identified.

A fleet of smartphones is now regularly used in the field for the purposes of GPS and as electronic notebooks, with in particular the use of the freeware Cybertracker for waterbird counts.

FOCUS

Individual variations in Greater flamingo breeding

© A.Arnaud

The variation of morphological, physiological and behavioural traits within the same species is often related to their breeding performance. The Greater flamingo does not depart from this rule and constitutes a good biological model for trying to understand how this variability is structured and maintained through natural selection.

Charlotte Perrot's doctoral thesis examined this issue by studying the roles of the sex and age of Greater flamingos on the variability of their reproductive traits (2013-2016). Long-term monitoring of the Greater flamingo in the Camargue has been conducted since 1977. Every year, about 12% of the chicks are banded with rings that have a unique alphanumeric code. These rings can be read from a distance, and provide information about the identity, sex and age of the individuals.

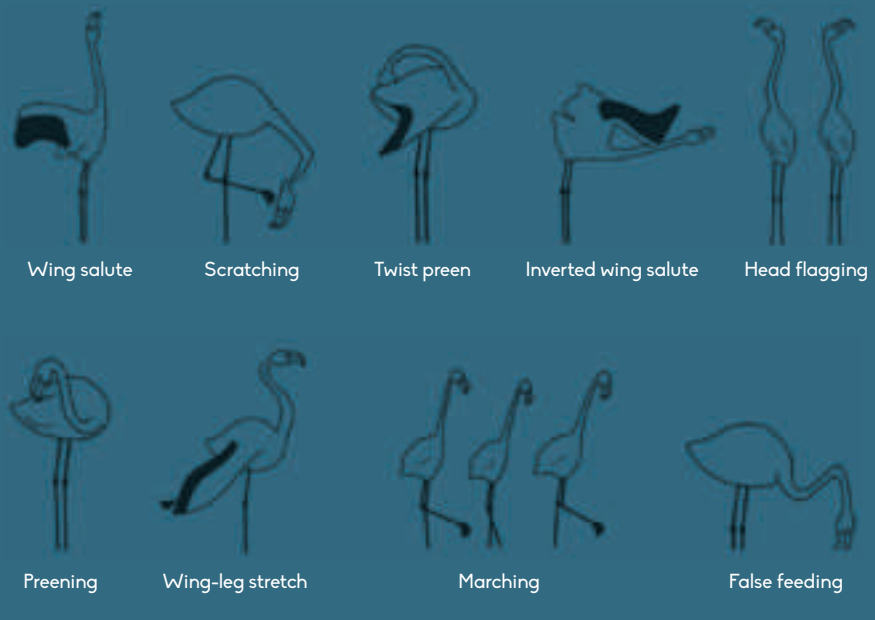
The longevity of Greater flamingos is estimated to be about fifty years in the wild, so this monitoring has provided us with a rather wide range of ages, making it possible to study the influence of age on reproductive traits.

In addition, it is a monogamous species, whereas the studies concerning differences in reproductive traits between the sexes have been principally carried out on polygamous species. Our study of the Greater flamingo has filled in this gap. We focused in particular on three key aspects of breeding: sexual display, the bodily condition of the chicks before they leave their nest, and their age at first breeding.

COURTSHIP DISPLAY MOVEMENTS

The complexity of sexual display is defined by the number of different movements multiplied by the number of different transitions between these movements realized by an individual during a display sequence of five minutes.

Drawings © S. Hilaire



Sexual displays of the Greater flamingo

Sexual displays take place in a mixed-sex group between November and March. They consist of nine different movements organised in a more or less ritualised sequence. An influence due to age, but not sex, was observed on the complexity of the displays. Indeed, complexity increases during the first years of life up to a maximum for intermediate age individuals and then declining in older ones. This observation suggests there is a process of maturing of the locomotor system in young individuals and then senescence in old individuals. We also showed a positive relation between complexity and reproductive skills, and also that within pairs the two partners demonstrate a similar level of complexity.

The complexity of sexual displays thus appears to be an honest signal of the reproductive quality of the individual and directly involved in the choice of a partner.

Juvenile body condition

Juvenile body condition is known to influence the survival and future breeding of individuals. Our study revealed a positive relation between the juvenile body condition of male parents and their chicks. In other words, the males that were in good shape when they were chicks produce chicks that are themselves in good shape.

On the contrary, the juvenile body condition of females does not seem to have an impact on that of their chicks. Therefore, juvenile body condition seems to have different long-term reproductive consequences for males and females. The mechanisms at play (genetic, behavioural, etc.) remain poorly understood and merit further study.

Age of sexual maturity

In the Greater flamingo, sexual maturity is reached at three; however individuals sometime delay their first breeding until ten. Using the capture-mark-recapture model, we estimated the average age at first breeding to be 6.5 years for males and females. For females this average age corresponds to the optimum breeding age for producing the greatest number of chicks during their lives (number of chicks produced: 1 to 17). On the other hand, our model indicates that it would be in the interest of males to breed at the earliest possible age (3 years) to produce the greatest number of chicks possible. The fact that on average they breed at 6.5 years suggests that young males face difficulties in their attempts to breed. Therefore, even if males and females breed for the first time at the same age, the underlying mechanisms seem to be different.

We have shown that in the Greater flamingo the variability of reproductive traits is greatly influenced by age and sex. Perrot's thesis shows the interest of studying all aspects of reproduction, with notable emphasis on access to breeding (sexual displays), which is often not given enough consideration. Our research should encourage scientists to pay more attention to the sex of individuals in their study of reproductive behaviour in monogamous species, even if at first sight the sexual roles seem to be similar.

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PROJECT LEADERS: Arnaud Béchet and Roger Pradel

TEAMS: Species conservation (Tour du Valat) / Biostatistics and population biology (CEFE - Centre of Functional Ecology and Evolution)

FINANCIAL PARTNERS : Doctoral contract from SupAgro (French National Agricultural Institute)

TECHNICAL PARTNERS: University of Burgandy / Salins du midi / Pont de Gau Ornithological Park

BIBLIOGRAPHY:

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ECOSYSTEMS
DEPARTMENT

Modelling, restoration and management of ecosystems

© Julie Campagna – UMR 6554 CNRS LEGT-Angers

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 axes:

- 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.

Continuing the initiatives implemented during the previous programme, 2016 was filled with interactions between the various projects and departments, always with a view to better understanding and therefore better management of Mediterranean wetlands. While the new programme means new projects and challenges, 2016 also testified to the outcome of work carried out in the previous programme.

For example, a first Red List of habitats compiled using the EUNIS nomenclature and the methodology advocated by the IUCN (International Union for the Conservation of Nature) for assessing the risks of ecosystem collapse is now available for the whole of Europe. The List reveals a high proportion of threatened habitats, particularly for Mediterranean wetlands.

We should also mention the finalisation of the first phase in the restoration of the Camargue Salt Works Lagoons and Marshes with the LIFE+ project MC-SALT (2012-2016). Engineering works were carried out, guided by modelling of hydro-saline dynamics, to create two islets for nesting waterbirds, one for gulls, terns & waders and the other for Greater Flamingo, and also to improve hydrobiological connections both within the site and with surrounding water systems. These works, combined with naturally occurring breaches at the seafront, are helping to improve the ecological status of the lagoon system and its potential for hosting fish populations. Moreover, monthly fish monitoring was initiated in 2016, through collaboration with the Conservation of Species Department. Finally, the return to gravity-driven water management in keeping with natural cycles uncovered 340 hectares of perennial Salicornia salt meadows (sansouires) on the site.

Concerning long-term projects, it is worth highlighting the promising results of an innovative mosquito control system based on mosquito traps. It is currently being tested in the village of Le Sambuc as an alternative to the traditional system used in the Camargue, insecticide spraying *(Bti - Bacillus thuringiensis israelensis).* For real-time information about the results of this experiment, just visit the Facebook page Le moustique du Sambuc (in French). We should also note the launching of the operational phase in the agroecological project at the Petit-Saint-Jean Estate, with the planting of 4800 vines (4 varieties) and 704 trees (mainly fruit trees) during 2016, in parallel with tests with regard to the growing of annual crops. Further planting (vines, timber) is planned for 2017, again with the aim of developing multi-use systems and synergies between agricultural production and the conservation of natural heritage.

New projects and initiatives were launched in 2016 on the themes of governance, ecological services, nature-based solutions, and adaptation to climate change. These subjects are set to be further developed by the Department in the course of the next few years.

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The Ecosystems team

LEFT TO RIGHT, TOP TO BOTTOM:

Nathalie Chokier, Charlotte Ravot, Samuel Hilaire, Manon Hess, Olivier Boutron, Arnaud Guille, Philippe Lambret, Gaëtan Lefebvre, Brigitte Poulin, Émilie Luna-Laurent, Virginie Mauclert, Olivier Brunet, Nathalie Barré, Nicolas Beck, & Lisa Ernoul.

MISSING:

Julie Campagna, Philippe Chauvelon, Hugo Fontes, Antoine Gazaix, François Mesléard, Cannelle Moinardeaux, Marc Thibault, Loïc Willm & Nicole Yavercovski.

Finally, I could not sign off without mentioning the new faces that joined the team in 2016: Plant ecology engineer Hugo Fontes took over from Nicole Yavercovski after her retirement; Olivier Brunet took up his post as head of crop plants at the Petit-Saint-Jean Estate; and hydrological technician Émilie Luna Laurent was hired to assist Olivier Boutron, on the departure of Philippe Chauvelon after more than 20 years of dedicated service to the Tour du Valat.

Brigitte Poulin
HEAD OF DEPARTMENT

ECOSYSTEM PROJECTS

1 - Modelling the dynamics of ecosystems

Olivier Boutron / boutron@tourduvalat.org

In collaboration with the Species Department, a major research area was developed concerning hydro-biological interactions, combining hydrology and health ecology, with the study of the dynamics of the influenza A virus in the Vaccarès hydrosystem, and the study of the dynamics of Lymnaea pond snails in the canals of the Camargue.

With regard to the Camargue Former Salt Works Lagoons and Marshes, the hydrodynamic and conceptual models of the northern part of the site were finalised in 2016, enabling the testing of different short and medium-term management scenarios (Total Foundation project 2014-2016). These scenarios will be able to include hydro-biological exchanges, thanks to information provided by a fish monitoring programme initiated in the autumn in collaboration with the Species Department. The medium-term objective is to enhance the potential of the site for hosting migratory fish.

Modelling in favour of a participative approach to improve the governance of wetlands (Fondation de France project 2015-2017): with the help of a participative geographical information system (GIS) several concertation meetings were held in order to map the spatial areas associated with the Flamingo by the various socio-professional groups in the Camargue Man and the Biosphere (MAB) Reserve. In collaboration with the Species Department, the results (water level, salinity) of the conceptual model started to be used as input variables of a spatial distribution model of the Greater Flamingo for future concertation meetings.

Ecosystem Services (H2020, ECOPOTENTIAL Project 2015-2019)

The aim of this European project is to monitor the status of and services provided by wetlands in the Camargue by means of data gathered in the field and, above all, by remote sensing for automatic monitoring of indicators useful to the managers of the Camargue MAB Reserve: duration of flooding of marshes, rotation of crops, surface area of reed beds cut, etc. In parallel, there is a thesis underway about the evolution of the vegetation of the former salt pans linked to the topography and hydrological management of the site.

2 - Restoration of ecosystems

François Mesléard / mesleard@tourduvalat.org

There are four projects concerning the creation, re-creation and rehabilitation of ecosystems and communities:

- at the Cassaire site in the Camargue, the re-creation of a wetland for conservation and hunting purposes on 70 ha of former agricultural land;
- the creation of a network of temporary ponds in the Camargue to favour, in particular, the damselfly species *Lestes macrostigma;*
- for the Camargue Salt Works Lagoons and Marshes, the reestablishment of a more natural hydrological regime through the reconstitution of a continuity of functions and the rehabilitation of ecosystems;
- the restoration and conservation management of a population of *Lythrum thesioides* in temporary ponds potentially impacted by the new high-speed train line (Nîmes bypass). Antoine Gazaix is in charge of this project within the framework of his thesis (funded by SNCF Réseau / Oc'via Construction).

The management of biodiversity by grazing essentially consists of one project (Cannelle Moinardeau thesis, University of Avignon, in collaboration with IMBE - Mediterranean Institute of marine and terrestrial Biodiversity and Ecology) aimed at testing the capacity of domesticated herbivores (horses, goats) to maintain or increase diversity at different spatial scales on high heritage value artificial habitats. This research also concerns the studies carried out in the Camargue, in particular on the Tour du Valat Estate, regarding the management of biodiversity and control of woody plants by grazing, for which monitoring and / or analysis is currently underway.

The Control of invasive species, started in 2015 concerns the destruction of the seed stock and vegetative parts present in the soil, using microwaves on the land, then restoring the initial plant communities after treatment. Various species are targeted, such as Ludwigia, Giant Cane and Ragweed. The project is being developed in the framework of an industrial consortium.

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3 - Adaptive and integrated management

Lisa Ernoul / ernoul@tourduvalat.org

Management of the Tour du Valat Estate

By means of an integrated and adaptive approach, and the use of new methodologies (Open Standards, ATEN / RNF, Water Agency) the 6th management plan for the Tour du Valat Estate was finalised. In order to preserve the meadows and control invasive woody plants, sheep now graze part of the estate.

Camargue Former Salt Works Lagoons and Marshes

With a view to strengthening the adaptive management of the site, thematic discussion groups of managers and scientists were created to share current knowledge about the site and take into consideration future uncertainties. Each group proposed hypotheses in function of its disciplines and / or the issues concerned (CNRS Défi Littoral Project), which were discussed together to produce a conceptual model of the site's dynamics and their socio-ecological interdependences (hydro-biological functioning, biodiversity and integration of the site in the surrounding area). A study of various prospective exercises in French coastal zones was carried out to produce a summary in function of several criteria.

Agroecological project on the Petit Saint-Jean Estate

In the western Camargue to promote multiple land-usage and the synergies between agricultural production and the conservation of the natural heritage (see Focus p.32.)

Activities on the northeast Mediterranean coast

The interactive simulation tool Mar-O-Sel (http://mar-o-sel.net/home.php), developed by Tour du Valat using data gathered in the Camargue, was extended to the whole Mediterranean Basin in 2016. The software, which displays the impact of the management of water and salinity levels and climatic variability on the evolution of wetlands, is now used in the Gediz Delta in Turkey, after training was provided on-site in the presence of a representative of the PACA Region. The mapping of habitats was carried out, and monitoring protocols implemented for species of reptiles, amphibians, mammals and birds, together with the impact of domesticated herbivores on the plant communities. The scientific collaboration agreement for the Gediz Delta was signed with the University of the Aegean.

4 - Mediterranean Lagoons Transfer Unit

Virginie Mauclert / mauclert@tourduvalat.org

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). The initiative is part of the network of Wetlands Transfer Units coordinated by the French Biodiversity Agency (AFB).

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

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

Mutualising knowledge and good practice

The website www.pole-lagunes.org, an information portal about the lagoons, received 80,000 visits in 2016 and 8 issues of its newsletter "Lettre des lagunes" were sent to more than 3000 stakeholders.

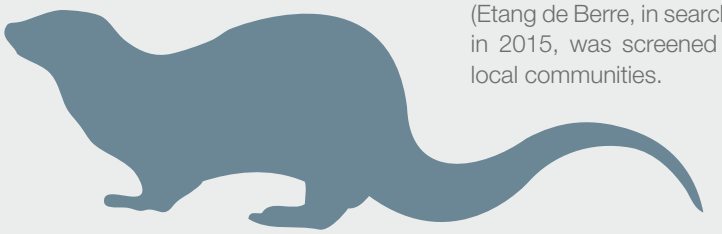
Facilitating an exchange network

At the request of the management organisations' technical teams, a training course and guide on the theme "Communicate better with your elected representatives" were offered, with the support of a sociologist and a doctor of social psychology. The facilitation of the FILMED network was continued, with two meetings about the simplified physicochemical monitoring of some twenty lagoons in Occitanie and PACA.

© Pôle-relais lagunes méditerranéennes

Awareness raising through key events

A new attendance record was achieved in the lagoons area for World Wetlands Day and European Heritage Days, with more than 28,000 visitors. The documentary film "Etang de Berre, en quête d'une lagune cachée" (Etang de Berre, in search of a hidden lagoon), produced in 2015, was screened four times at talks-debates in local communities.



FOCUS

The Petit Saint-Jean Estate, a showcase for agroecology in the Mediterranean region

In 1981, the Tour du Valat Foundation inherited by donation the estate of Petit Saint-Jean in the Western Camargue, in the commune of Saint-Laurent-d'Aigouze. After 30 years of legal wrangles, the site was acquired ipso jure by the Foundation in May 2012. Totalling 101 ha, the property is made up of agricultural land (26 ha), temporary marshes (25 ha), and a remarkable pinewood (50 ha).

The Petit Saint-Jean site is an integral part of the Camargue Gardoise Natura 2000 site. It includes several habitats of community interest including conservation-priority dunes with Stone Pine forest. Within the woods there are clearings made up of sandy grasslands with an exceptionally rich flora. There also are five quasi-permanent ponds that host an interesting variety of reptiles and amphibians including European Pond Terrapin and Western Spadefoot Toad. Among the other remarkable vertebrates in the woods we could mention Common Genet or Eurasian Eagle-Owl. In the south, the temporary marshes essentially consist of rushbeds, salt meadows with glasswort, and Mediterranean grasslands. From a botanical point of view, recent surveys of the grasslands, meadows and clearings led to the identification of more than 400 species including, among the most exceptional, Bug Orchid, *Kickxia commutata,* Spurge Flax, and *Alyssum alyssoides.*

Right from 2012, all the existing agricultural land (meadows and vineyards) was converted to organic farming. However, the Tour du Valat wanted to go further by setting up production systems based on the principles of agroecology and agroforestry, using an experimental and demonstrational approach.

The project is founded on three principles: seeking synergies between agriculture, land uses and-biodiversity, adapting to the Mediterranean climate and the way it is evolving through the wise use of water, and limiting the use of unrenewable resources. It is being carried out by applying four specific objectives:

- To develop a multi-partner agroecological project covering the entire property, based on experimentation;
- To set up agricultural production systems that respect the environment and favour biodiversity, which will be planned by applying and/or adapting methods already used for natural areas (management plan, integrated and adaptive management, environmental monitoring);
- To assess the agronomic and ecological benefits of the various experiments implemented within a global perspective of site management, including their feasibility and economic viability (financial and human resource costs);
- To share the activities and transfer the results of the project to contribute to the uptake of the lessons learned at local and regional level, particularly by the agricultural profession.

Vines at the heart of the project

The aim for Petit Saint-Jean, which is at the heart of the "Sables de Camargue" PGI wine producing area, is to replant all the surface area officially under vine (4 ha) with Mediterranean grape varieties that could prove more suited to pedological conditions in a context of climate change. We plan to diversify the varieties

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used and apply the principles of microvinification, in keeping with the attention paid to the vines. The estate already has a small plot in production whose grapes are transformed into juice that is sold in several shops in the Arles area as well as internally at the Tour du Valat. In 2016, four small plots of 0.3 ha were planted with five different varieties. We also sowed cover crops to limit wind erosion and enrich the soil with organic matter, and completely stopped ploughing the soil. From now on only the soil at the base of the vine stocks will be turned over, using animal power. In spring and summer the planted cover crop will be crushed by roller, creating a mulch to limit evapotranspiration. In the longer term, we also intend further to limit the doses of copper and sulphur used by developing preparations based on plants found on the site (horsetails, ferns, nettles).

Sheep in the orchards

Two meadow orchards were planted in 2016 on two neighbouring two-hectare plots, with a total of 490 trees. They are intended for fruit production, as well as fodder harvesting and subsequently sheep grazing. Pistachio, persimmon, pomegranate, olive and almond trees were chosen due to their aptitude for growing on low water-retention soils and in the Mediterranean climate. Two different planting plans were selected to test the impact of either clustering or spreading out the tree species on pollination and pest control. Watering of the trees in the summer is carried out using a drip system with a photovoltaic solar pump and minimised by mulching with a plant fabric and 10-15 cm of wood homogenate produced on-site.

Agroforestry plots

A second agroforestry system, developed in collaboration with Agroof, was set up using wild pear and service trees, with the aim of producing timber. Various planting densities were selected to assess the impact of this factor on the development of the trees and, in the medium term, on the physiology of the crops between the trees. The range of agroforestry systems will be completed by two other options (nitrogen-fixing trees and fodder trees), thus creating a real showcase of agroforestry practices

A variety of crops to be more resistant to unpredictability

The product offer will be completed with niche crops suited to the climate and soils. Tests were carried out in summer 2016 on groundnuts and Cakile maritima; while the results seemed to be encouraging, the production systems will need to be improved to produce representative and marketable crops. We also intend to test the growing of sweet potatoes, chick peas, buckwheat, and historical cereal varieties in the rows between the trees or vines.

Structuring the plots with hedges and channels

In parallel with the cultivation of the abandoned land, a network of multi-species hedges (fruit-producing or windbreaks) is progressively being set up. In addition to their influence on microclimatic conditions (wind, sunshine exposure), these hedges favour biodiversity and cultivation auxiliaries acting as pest control. The restoration of the channels and water management systems will have the same effect at the aquatic level because the circulation of fresh water around the crops will protect them from soil salination, while at the same time generating biodiversity (amphibians, reptiles, invertebrates).

Communication and transfer activities

A leaflet and a poster have been produced to communicate about the project. Petit Saint-Jean is already open for receiving groups and students, whether in the framework of training or experience sharing. We also intend to develop propositions for receiving the public in partnership with the Federation for the Protection and Management of the Camargue in the Gard (SMCG) and the Nature Guides Office.

MANAGER: Nicolas Beck / beck@tourduvalat.org

TEAM: Olivier Brunet, Céline Brunel (temporary contract), Mohamed Damich (temporary contract), Anthony Olivier, Nicole Yavercovski, Hugo Fontes, Brigitte Poulin

FINANCIAL PARTNERS: Fondation de France, Caisse d'Épargne, Fondation Lemarchand, Fondation du patrimoine, Klorane Botanical Foundation

TECHNICAL PARTNERS: Consultants in viticulture (Stéphane Beuret) and animal power (Jean Clopès), Agroof, Groupe de recherche en agriculture biologique, CIVAM Bio Gard, Gard Chamber of Agriculture, Centre Régional de la Propriété Forestière du Gard, Maison familiale et rurale de la Petite Gonthière (training centre), Federation for the Protection and Management of the Camargue in the Gard (SMCG), Marie Durant Agricultural High School in Rodilhan.

Rétrospective 2016

A LIFE DEDICATED TO BIRDS

The Tour du Valat community assembled to honour Alan R. Johnson

© Jean Emmanuel Hay

© Tour du Valat

Phillyrea grubbing and picking-up work

THE FUTURE IS ASSURED

© Tour du Valat

The school in Le Sambuc is renamed after Alan Johnson !

NEWS ON THE ESTATE!

© Tour du Valat

Our task is to graze Phillyrea regrowth where it has been cut

© Tour du Valat

To join, catalyse energies of the civil society in favour of wetlands, this is the goal of the Mediterranean Wetlands Alliance, which founding meeting took place at Tour du Valat.

Farewell Pat Dugan, Jean-Claude Lefeuvre, Jean-Dominique Lebreton, pioneers of the Science Council

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FIELD DAY WITH THE ASSOCIATION FRIENDS OF TOUR DU VALAT

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Regional workshop of the Mediterranean Waterbird Network in Arles

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The Tour du Valat visiting Luma-Arles construction site

© Tour du Valat

Claire Pernollet defending her thesis at Tour du Valat

WHERE ARE WE GOING?

© Tour du Valat

Mediterranean? No, the Fangassier pond, to the new flamingo islet

© Tour du Valat

NICOLE YAVERCOVSKI HANDING OVER TO HUGO FONTES

Inauguration ceremony of the Jean-Paul Taris Conference Room

Thank you Philippe Chauvelon for all those years of fruitful collaboration!

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The Tour du Valat was at the COP22 Climate in Marrakech

LAST GOOD BYE TO LUC HOFFMANN

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OBSERVATORY
DEPARTMENT

Mediterranean Wetlands Observatory

© L.Chazée

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

In 2016, the MWO team welcomed Ilse Geijzendoffer, who replaced Coralie Beltrame as head of the Ecosystem services axis. Nadège Popoff also joined the team for her civil service mission, and Patrick Grillas is now in charge of coordinating the Department. The following were among the significant scientific activities conducted this year:

- Remote sensing has become increasingly important at the Observatory, with the launching of a study on the surface area of flooded zones and of potential wetlands, which covers the entire Mediterranean Basin. This type of study, contrary to inventories that remain difficult to implement in many Mediterranean countries, could rapidly produce an indicator for the condition of wetlands;
- Our study on the dynamics of wintering waterbird communities in the Mediterranean Basin was continued with an analysis of the effects of climate changes, land cover and protection policies;
- An initial list of national socio-economic macro-indicators pertinent for wetlands was established, which includes those developed in the framework of the 2016-2020 Mediterranean Strategy for Sustainable Development.

Our link with the MedWet secretariat was strengthened, particularly in the domains of transfer, the communication of the findings of the Mediterranean Wetlands Observatory (MWO), and the creation of four MedWet country profiles. The strategic priorities, general orientation and organisation of the MWO were approved by the MedWet/Com in Paris in February, 2016.

Our technical partnerships with the National Office for Hunting and Wildlife (ONCFS), Wetlands International and our partner countries in the Maghreb were maintained and further strengthened thus enabling us to gain access to major databases on wintering waterbirds. Our partnerships with the Blue Plan, the Directorate General of Forests of Algeria and MedINA (Mediterranean Institute for Nature and Anthropos) for the cultural aspects of wetlands were strengthened and better organised through official agreements. Joint projects are being prepared with the IUCN (International Union for the Conservation of Nature) and a solid partnership has been developed within the framework of European research projects SWOS (Satellite-based Wetland Observation Service) and ECOPOTENTIAL.

The MWO Department further developed the communication of its scientific results with three papers published in international journals. Our efforts in terms of communication and transfer included our participation in several international conferences for scientists, policy makers and conservation stakeholders including MED-COP22, INTECOL (International Congress of Ecology), Ramsar's Scientific and Technical Review Panel (STRP), and the IUCN World Conservation Congress.

To conclude, the launching of the Mediterranean Wetlands Alliance has created a synergy within a community of stakeholders who are mobilising for wetlands in the Mediterranean region in the aim of raising the awareness of decision-makers about wetlands. This is also the occasion for the MWO to transfer and promote its results vis-à-vis its numerous partners so that the services and functions provided by wetlands will be better taken into account in policies throughout the Mediterranean region.

Patrick Grillas
HEAD OF DEPARTEMENT

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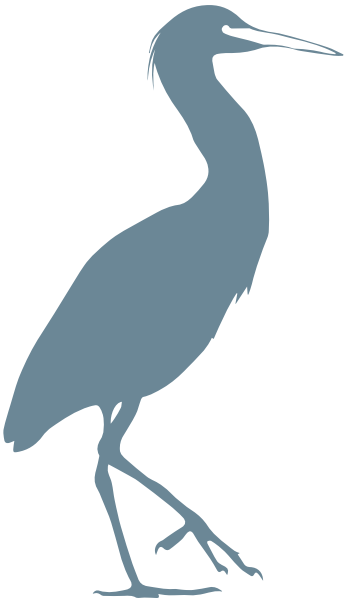
The Observatory team

LEFT TO RIGHT, TOP TO BOTTOM:

Laurent Chazée, Nigel Taylor, Amandine Thomas, Sophie Guingand, Anis Guelmami, Ilse Geijzendorffer, Patrick Grillas, & Nadège Popoff

MISSING:

Coralie Beltrame, Élie Gaget, Thomas Galewski & Christian Perennou.



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OBSERVATORY PROJECTS

1 - Ecosystem Services

Ilse Geijzendorffer / ilse@tourduvalat.org

Ecosystem services are a major argument in favour of the conservation and wise management of Mediterranean wetlands because they show us how wetlands, when they function correctly, are useful for human societies. Three main types of services are generally described: provisioning, regulating and cultural services. Our aim is to study the complex interactions of socio-ecological systems between people and nature.

To identify and quantify ecosystem services based on the ecological functioning of wetlands, we have developed several indicators in two subject areas:

- "Wetlands and flood control" using satellite data; tests are being carried out in five Mediterranean catchment areas in France, Algeria, Morocco and Tunisia;
- The recreational services provided by wetlands through visitor centres, and tested on French Ramsar sites (collaboration between the National Wetlands Observatory and the Association Ramsar-France).

The Plan Bleu MedEscWet project ended in September, providing an economic assessment of specific ecosystem services on four pilot sites.

ECOPOTENTIAL/H2020 Project

This European Union research project includes 47 partners. It aims at "improving future ecosystem benefits through earth observations ". The Camargue is one of the project's case studies. The Observatory is involved in the ecosystem services work package (WP7) and is in charge of coordinating communication and stakeholder involvement activities (WP12), which is closely connected to the work package on the integration of the results by protected areas and political decision-makers (WP11).

2 - Monitoring the biodiversity of Mediterranean wetlands

Thomas Galewski / galewski@tourduvalat.org

By cross-matching the land-cover and species-populations monitoring data compiled by the MWO and completing them with information contained in other database (Ramsar Sites, Important Bird Areas, Key Biodiversity Areas, Important Plant Areas, IUCN Red List), it is now possible to improve our knowledge about the status of biodiversity, and to precisely identify the causes of the problems it faces and effective solutions for solving them.

A Red List Index (RLI) for the Mediterranean region

The RLI is based on changes in the status of species on the IUCN's Red List over time. It is being developed using endemic Mediterranean species and will complete our series of biodiversity indicators. In addition to providing an assessment of the risk of the extinction of wetland biodiversity, it takes into consideration the plants and animals (non-vertebrates) that are not covered by other indicators such as the Living Planet Index. An inventory of all existing Red Lists (RLs) in the world was carried out, at regional and national level, and a list was drawn up of all the endemic species associated with wetlands, and thus identifying the priority species to be assessed according to RL criteria.

Assessment of the impact of climate changes on waterbirds (see Focus p.42)

3 - Water monitoring

Christian Perennou / perennou@tourduvalat.org

Despite the major issues regarding water, and the monitoring carried out in certain countries, there is still a lack of a global vision of water in the Mediterranean Basin, including an ecosystem perspective. More often than not, the link with wetlands is weak. Starting from this observation, through several projects and activities, the Department is developing:

- spatial mapping of flooded areas (as a contribution to the inventory of potential wetlands in the Mediterranean). In 2016, the dynamics of areas of open water were mapped in the costal zones of Albania, Montenegro, Bosnia-Herzegovina, Croatia, Slovenia, Italy, France, Spain, Portugal, Morocco, Algeria and Tunisia;
- the SWOS project (financed in the framework of the European Union Horizon2020 programme), which is intended to improve the use of satellite images in identifying, delimiting and monitoring wetlands. The-project team includes 13 partners (6 NGOs, 4 private companies and 3 universities) from 8 European countries. In 2016, an analysis was carried out of their needs at different scales (local, national, regional and worldwide). Seven pilot sites, including the Camargue, and 40 other sites were selected (25 in the Mediterranean region).

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4 - Local and national observatories

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The specific aim of this project is to assist the setting up of observatories at national or local scale to inform their target groups about trends in their wetlands and to accelerate behavioural changes favourable to wetlands in the Mediterranean Basin. In 2016, three activities were carried out:

- Support for the MedWet network of NGOs in the framework of the project "Wetland Sentinels in the Maghreb", directed by WWF in Tunis. A series of "Indicators" training workshops was set up, leading to the drawing up of a preliminary list of 11 indicators and their monitoring protocols. This list was selected by the NGOs and approved by the project steering committee. 18 associations were able to benefit from three training sessions organised by the Tour du Valat;
- Support for the French National Wetlands Observatory (ONZH) set up by the French Ministry of Environmental Transition. In this framework, a 2nd thematic brochure "Evolution of ground cover in 32 Ramsar sites in Metropolitan France" was published, together with a 4-page summary;
- Support for the PACA Regional Biodiversity Observatory (ORB-PACA) with the development of a Living Region Index (LRI), based on the MWO's experience with the Living Planet Index (LPI).

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5 - Wetlands in the framework of sustainable development in the Mediterranean

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The specific aim is to produce knowledge, analysis and indicators for national and local decision-makers concerning the deep causes of change, the consequences for people's means of existence, and the responses of different countries. In 2016, this new research theme made use of the preparatory work carried out during the previous programme on international agreements, and the analysis of macro-indicators potentially pertinent for wetlands concerning the political, legal and socio-economic frameworks.

In addition to the activities developed within these five main themes, the Department contributed to the production of studies and summaries concerning the status and trends of Mediterranean wetlands in order to convince political decision-makers, with the help of intermediary partners, that current trends are against the long-term interests of the countries and their populations, and contrary to their international commitments. These summaries and the transfer process are developed in close partnership with MedWet.

Participation in scientific conferences

The MWO organised a symposium on the link between science and politics at the annual conference of the French Ecology Society in Marseille. The MWO's results were also presented at the INTECOL wetlands conference in China, the meeting of the European Bird Census Council in Germany, the EcoSummit conference (France), and also during the Regional Workshop on the ecosystem services supplied by wetlands (Plan Bleu) and at the "International surveillance and visitor management in leisure and protected areas" conference in Serbia.

International Bodies

The work on the surveillance of Mediterranean wetlands was presented at the Global Earth Observation – Biodiversity Observation Network (GEO BON) conference. At MedCOP, a preparatory meeting for COP22 in Marrakech, the Tour du Valat contributed to discussions about the possible solutions wetlands could offer to attenuate the effects of climate change. The MWO participated in the preliminary meetings for the preparation of the Status of Ramsar wetlands worldwide at the INTECOL Conference (Changshu, China). The MWO was also invited to participate in the National Wetlands Committee, in the workgroup "Knowledge and wetlands".

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FOCUS

Using historical observations to understand the long-term evolution of bird populations

Natural area managers and decision-makers often make use of indicators to assess the conservation status of the biodiversity that they are protecting. Some of these indicators such as the Living Planet Index are based on species monitoring that is repeated over time, thus enabling trends to be calculated. This makes it possible to identify the most threatened taxonomic groups, ecosystems or geographical regions, and also to assess the efficacy of undertaken conservation measures.

Woodchat shrike
Lanius senator
© F.Veyrunes

One of the weak points of this approach is the relative newness of biodiversity monitoring. One of the oldest monitoring programmes, the International Waterbird Census, was initiated in 1967 but only really took off as from the 1980s. In France, the common-bird monitoring programme "Suivi Temporel des Oiseaux Communs" only started in 1989, and that was well before similar programmes in the other Mediterranean countries of Europe. Trends are therefore calculated using a reference base that is recent, whereas the pressures weighing on the species are much older. There is a major risk of underestimating the severity of any observed decline that started before monitoring programmes were set up.

Our case study: the birds of the Camargue

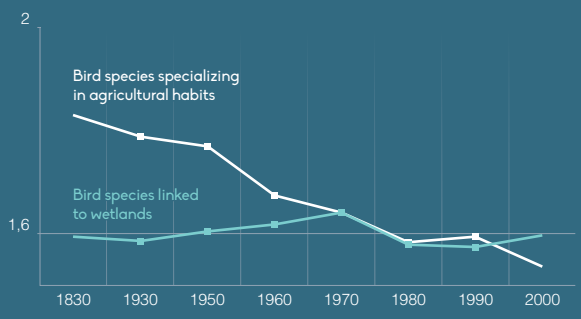
According to *Bonebrake et al.* (2010), historical data such as observations made by naturalists in the past are very valuable for revealing or dating changes in the status of species. There are few regions of Europe where birdlife has been studied so much and for so long as in the Camargue: 43 works before 1900, 430 between 1900 and 1980, and many more since then. Using the ornithological literature of the past, we were able to reconstruct the nesting bird community from the start of the 19th century to the present, highlighting the changes in status (i.e. whether a species is absent, rare or common) over time.

172 bird species have been observed as breeding in the Camargue over the last two hundred years. However, only 67 were sighted throughout this period, indicating that the community is highly unstable. Many species have disappeared over the years: Black Tern, Northern Shoveler, Ortolan Bunting, Woodchat Shrike, Common Whitethroat, Penduline Tit, and Southern Grey Shrike, to name but a few. Many species, on the other hand, have lastingly colonised the delta, for example Red-crested Pochard, Tawny Owl, Black Kite, Jackdaw, Cattle Egret, Mediterranean Gull, and Spoonbill. Some were present in the 19th century, died out, and then came back again (Grey Heron, Slender-billed Gull), while others appeared at some time during the period but did not remain (Montagu's Harrier). Concerning the number of species, the overall assessment is quite positive, with an increase in the number of breeding species over time (130 species at the start of the 2000s, compared with 113 in 1830).

The abundance of bird species nesting in the Camargue has also evolved considerably. The numbers of some species have greatly increased, shifting from the status "rare" to that of "common". This is the case, for example, of the Common Shelduck or the Common Moorhen. For instance, in the 19th century moorhens seem to have been rarer than the three species of crake! Conversely, other previously abundant species are now rare. Until the 1980s, the European Turtle Dove occupied all the woods and thickets of the delta, and the Marsh Harrier used to be described as the "most common" raptor. The status of these two species has since markedly declined. Over the long term, the overall assessment is negative this time, with a considerable reduction in the abundance index of nesting birds, particularly between the 1950s and 1980s. Only one species in three can now be considered as common, whereas 50 years ago the proportion was two out of three.

A decline probably explained by agricultural changes in the Camargue

Analysis in function of habitat shows that this loss of abundance concerned bird species specializing in agricultural habits more than those linked to wetlands, which can be easily explained by upheavals in land use practices. After the Second World War and until the 1980s, the Camargue underwent a major transformation of its agriculture, aimed at making it more competitive. Rice-growing was developed, to the detriment of huge areas of natural habitats (Salicornia salt meadows, dry grasslands) which until then were used for grazing sheep, cattle or horses. The decline or disappearance of several species typical of open pasture is probably linked to these changes (e.g. Calandra Lark). Permanent crops (vineyards, orchards) were largely replaced by annual crops (wheat, rice) that are little suited to nesting birds (e.g. Red-legged Partridge). Finally, the modernisation of agricultural practices was coupled with the destruction of hedge networks and the massive use of pesticides, which further reduced the food resources available: insects and the seeds of meadow flowers (e.g. Scops Owl, Linnet). On the other hand, over the same period, the introduction of large quantities of freshwater for rice-growing, the development of vast complexes of salt marshes, and the protection of many marshes and lagoons played a role in maintaining a diverse and abundant waterbird community.



So, nature observation data from the past has revealed a major reduction of birds in the Camargue, a trend that had not been highlighted by recent monitoring. In two hundred years, biodiversity carrying capacity has never been so low, a phenomenon that certainly extends largely beyond the limits of the Rhône Delta. These results should spur us to redouble our efforts to foster a coverage and usage of land more compatible with a higher level of biodiversity.

FOR FURTHER INFORMATION: Galewski T., Devictor V. 2016. When Common Birds Became Rare: Historical Records Shed Light on Long-Term Responses of Bird Communities to Global Change in the Largest Wetland of France. Green AJ, editor. PLOS ONE 11:e0165542. doi: 10.1371/journal.pone.0165542

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HEAD OF PROJECT: Thomas Galewski / galewski@tourduvalat.org

TEAM: Mediterranean Wetlands Observatory

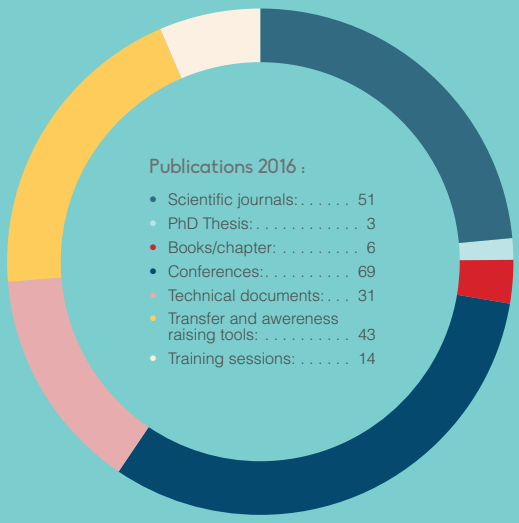
FINANCIAL PARTNERS: Prince Albert II of Monaco Foundation, Total Foundation, French Ministry of the Environment, Energy and the Sea

TECHNICAL PARTNERS: Vincent Devictor (CNRS-University of Montpellier) together will all the birdwatchers of the Camargue.

Yannick Michelier,
GROUNDS TECHNICIAN
AT TOUR DU VALAT

“ Being at Tour du Valat is a chance for me! I get to maintain the areas around the farm, surrounded by the fauna and flora of the Camargue I have loved since my childhood ”

OUR ACHIEVEMENTS



Knowledge transfer is central to 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.

Increased scientific and technical production in 2016

With 51 articles published in international scientific journals, our scientific production was stable in terms of the number of papers published, with an increase in terms of their importance (including their impact factor (cf. Figure p46). Three doctoral theses were also completed in 2016.

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

Among the wide variety of significant publications that are Tour du Valat achievements, we may cite:

- An article demonstrating that antibiotic resistance, a major issue for human health is not only present in hospitals and livestock farms, but is also propagated in natural environments.
  Vittecoq M., Godreuil S., Prugnolle F., Durand P., Brazier L., Renaud N., Arnal A., Aberkane S., Jean-Pierre H., Gauthier-Clerc M., Thomas F., Renaud F. 2016. Antimicrobial resistance in wildlife. Journal of Applied Ecology 53:519–529. doi: 10.1111/1365-2664.12596.
- An article demonstrating the cocktail effect on wildlife of the combined utilisation of an herbicide and an insecticide, and the variability of the impacts in function of the developmental stage of frogs.
  Mesléard F., Gauthier-Clerc M., Lambret P. 2016. Impact of the insecticide Alphacypermetrine and herbicide Oxadiazon, used singly or in combination, on the most abundant frog in French rice fields, Pelophylax perezi. Aquatic Toxicology 176:24–29. doi: 10.1016/j.aquatox.2016.04.004.
- An article demonstrating the contribution of historical analysis in the assessment of changes in biodiversity. Most of the current approaches are only based on recent data, from after the beginning of major modifications in land use.
  Galewski T., Devictor V. 2016. When Common Birds Became Rare: Historical Records Shed Light on Long-Term Responses of Bird Communities to Global Change in the Largest Wetland of France. PLOS ONE 11 : 1-18.

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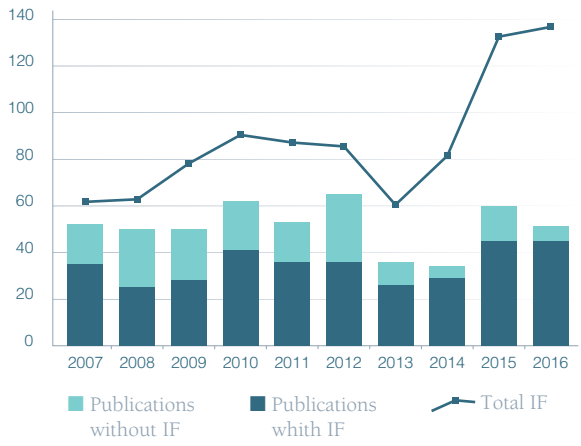

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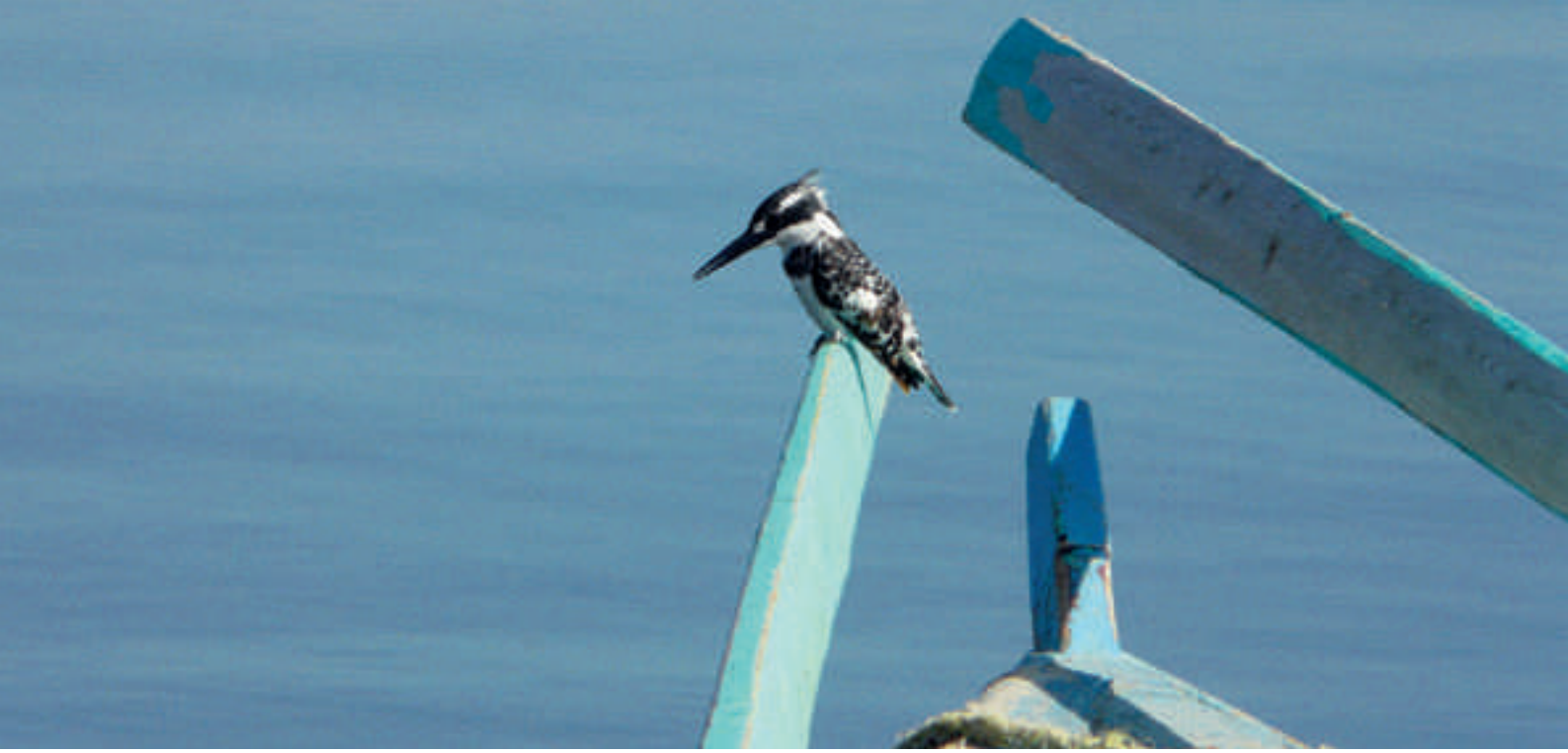

Pied Kingfisher
Ceryle rudes
© L.Chazée

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Thesis

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  Sélection d'habitat et dynamique spatio-temporelle des colonies chez deux espèces de Laridae : la mouette rieuse et le goéland railleur. Thèse de doctorat, Université Montpellier II.
- Pernollet C. 2016.
  L'utilisation des rizières par les canards hivernants : vers une gestion des rizières en interculture favorable aux canards et aux agriculteurs. Thèse de doctorat, Université de Montpellier.
- Perrot C. 2016.
  Variations individuelles des traits reproducteurs chez le Flamant rose : de l'appariement à l'envol des jeunes. Thèse de doctorat, Université de Montpellier.

Selected technical documents

- Chazee L., Réquier Desjardins M., Khechimi W. *et al.* 2016.
  Les services culturels récréatifs et éducatifs des zones humides en Méditerranée : des services sous-estimés malgré les avantages qu'ils procurent - résultats d'études en Méditerranée. Tour du Valat. 46 pp.
- Ernoul L., Beck N., Olivier A., Poulin B., Lefebvre G., Galweski T., Germain C., Willm L. & Bechet A. 2016.
  "Assistance technique pour la gestion intégrée des zones humides dans le delta du Gediz en Turquie" 2015-2016. Région PACA. 50 pp.
- Perennou C., Guelmami A. et Gaget E. 2016.
  Les milieux humides remarquables, des espaces naturels menacés. Quelle occupation du sol au sein des sites Ramsar de France métropolitaine ? Rétrospective 1975- 2005. Rapport Tour du Valat/ Observatoire des Zones Humides Méditerranéennes/ Observatoire National des Milieux Humides/ MEEM, 53 pp.
- Pôle-relais lagunes méditerranéennes. 2016.
  Les espèces exotiques envahissantes en milieux humides. Bulletins bibliographiques des Pôles-relais zones humides. 42 pp.

Transfer activities

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, such as the IUCN World Conservation Congress, and the Cop 22, 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 conference-debates with the Mediterranean Lagoons Transfer Unit (MLTU), as for example the one on the landscapes of the étang de Berre, at which the film "Étang de Berre, en quête d'une lagune cachée" (Etang de Berre: in Search of a Hidden Lagoon) was shown in Istres and Châteauneuf-les-Martigues (13). In Montpellier, in the framework of the event Sports de glisse et nature sur le littoral (surfing, sailing, water sports and nature on the coast) the film Glisse par nature : vers la sensibilisation des sportifs (surf by nature : raising the awareness of athletes) was screened. It was produced by the MLTU, the Marine Protected Areas Agency, and the EID Méditerranée (Interdepartmental Agreement for Mosquito Control on the Mediterranean coast).

Learn more about our many achievements on our document base, **www.tourduvalat.centredoc.fr**

Conferences & Seminars

Tour du Valat welcomes numerous partners and scientists to attend conferences and seminars dealing with conservation of Mediterranean wetlands areas.

YOUNG SCIENTISTS CONFERENCE

In collaboration with the CEFE-CNRS (Centre for Functional and Evolutive Ecology-CNRS Montpellier) and the IMBE (Mediterranean Institute of Marine and Terrestrial Biodiversity and Ecology, Aix-Marseille), the Tour du Valat has launched a cycle of conferences on nature conservation sciences in the Mediterranean region for young scientists.

© Tour du Valat

The principal objective of this conference is to create a scientific environment and a dialogue around the Mediterranean Basin on conservation sciences, and to share scientific knowledge and experiences to make it possible to respond to conservation challenges. Another aim of this conference is to stimulate informal discussions between young scientists and top-level conference speakers.

The third edition took place on the 22, 23 and 24 March 2016, with Jacques Blondel, emeritus Director of Research at the CNRS, serving as the President. Some fifty young scientists working in the Mediterranean region were given the opportunity to present their first research projects in the warm and friendly atmosphere at the Tour du Valat with the presence of seven renowned scientists:

- Dr Arnaud Béchet (Tour du Valat, France)
- Dr Slim Benyacoub (University of Annaba, Algeria)
- Dr Charlotte Francesiaz (CEFE-CNRS Montpellier, France)
- Dr Patrick Grillas (Tour du Valat, France)
- Dr Frédéric Médail (IMBE Marseille, France)
- Dr Alexandre Million (IMBE Marseille, France)
- Dr Bertrand Schatz (CEFE-CNRS Montpellier, France)

Renowned scientists presented their research in four plenary sessions:

- Bertrand Schatz (CEFE-CNRS Montpellier)
  Using past data to determine the conservation status and the dynamics of Mediterranean plant communities.
- Virginie Baldy & Yildiz Thomas (Biodivmex)
  Mediterranean biodiversity: major concepts confronting a diversity of experiences and case studies across the region.
- David Grémillet (CEFE-CNRS Monptellier)
  The spatial ecology of shearwaters from the western Mediterranean - Scaling up from local to international conservation.
- Slim Benyacoub (University of Annaba)
  The Conservation of Biodiversity in the Maghreb against Economic Development, Demography and Global Warming: the case of Algeria.

The Alan Johnson prize was awarded for the first time this year to a young scientist in recognition of the quality of his scientific research (and its application to conservation). It was given to Flavio Monti (CEFE-CNRS and University of Ferrara in Italy) for his presentation: “Negative impact of a marine protected area upon an emblematic Mediterranean raptor population”. The jury also praised the quality of the presentations made by Philippe Lambret (Tour du Valat), Clara Therville (IRSTEA - National Research Institute of Science and Technology for the Environment and Agriculture - Montpellier) and Simon Veron (MNHN - National Natural History Museum).

The next conference will take place in 2018.

HEINZ HAFNER LECTURE

Finally, 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 George Archibald, Co-Founder of the International Crane Foundation for a conference on the conservation of cranes throughout the world: “Cranes - Charismatic Ambassadors for the Conservation of Wetlands and Grasslands Worldwide”.

SEMINARS

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

- Stationnement et hivernage du canard souchet Anas clypeata dans une mare satellite temporaire de la zone humide de la Mékhada (nord/est de l’Algérie)
  Mohamed Dhaya El hak Khemis (Badji Mokhtar University, Annaba, Algeria)
- Quantifier la contribution de l’immigration dans la dynamique des populations d’oiseaux
  Alexandre Million (Institut Méditerranéen de Biodiversité et d’Écologie - IMBE)
- La compensation écologique dans les politiques publiques, comme outil de conciliation des intérêts économiques et des objectifs de conservation de la biodiversité
  Coralie Calvet (UMR LAMETA, Campus Supagro Montpellier)
- Réhabilitation d’un marais temporaire méditerranéen par la gestion hydraulique avec maintien de l’activité cynégétique : les Odonates en tant que levier et indicateur de réussite
  Philippe Lambret (Tour du Valat)
- Évolution de l’occupation du sol dans les sites Ramsar de France
  Anis Guelmami et Christian Perennou (OZHM, Tour du Valat)
- Biologie et écologie de la population de raie manta Manta alfredi en Australie de l’Est
  Lydie Couturier (Mediterranean Institute of Oceanography, Aix-Marseille University)
- Fonctionnement démographique des populations soumises aux prélèvements : cas des fuligules milouins et morillons en Europe de l’Ouest
  Benjamin Folliot (Phd student ONCFS / Tour du Valat)
- Peut-on gérer la Durance ?
  Laure Moreau (Syndicat mixte d’aménagement de la vallée de la Durance)
- La recherche en Petite Camargue alsacienne
  Valentin Amrhein (Station de recherche de la Petite Camargue alsacienne)
- Les équidés et leurs environnements, de la Tour du Valat aux grands herbivores d’Afrique
  Patrick Duncan (CNRS / Centre d’études biologiques de Chizé)
- Sciences de l’environnement, histoire et (géo)- archéologie : comment écrire une histoire environnementale des zones humides littorales en Méditerranée ?
  Nicolas Maughan (CNRS / Aix-Marseille University)
- Mesures agro-environnementales et climatiques (MAEc) en Camargue
  Anne Vadon et David Lazin (PNR de Camargue)
- Mediterranean land systems: diversity, intensity and the future of land management in a dynamic region
  Ziga Malek (Faculty of Earth and Life Sciences, Vrije Universiteit Amsterdam)
- Environnement et psychologie sociale : résistance, changement des attitudes et des comportements. L’exemple du changement climatique Fabien Girandola (Aix-Marseille University, Laboratoire de psychologie sociale)
- Le Balbuzard pêcheur en Méditerranée : particularités écologiques et mesures de conservation
  Olivier Duriez (CEFE Montpellier) & Renaud Nadal (LPO Mission Rapaces)
- Understanding soaring flight dynamics in Procellariiformes
  James Kempton (Oxford University)
- Evolutionary Genomics of the Horse Domestication Process
  Ludovic Orlando (Museum of Denmark, University of Copenhagen)
- Caractérisation des durées d’inondation en milieu prairial par télédétection satellitaire radar
  Cécile Cazals (Paris-Est Marne-la-Vallée University & IGN)
- Modélisation hydrologique par une approche multi-agents
  Cyril Fleurant (Angers University)
- Vers un nouvel indicateur de l’impact des sangliers sur les oiseaux nichant au sol
  Fabrice Roda
- Anciens salins de Camargue. Évolution des paysages en cinq ans (2011-2016)
  Gaël Hémery (PNR de Camargue) et Jean Emmanuel Roché
- Man & Biosphere Health, Kristianstad University, and UNESCO Biosphere Reserve Vattenrike
  Pär Söderquist (Kristianstad University, Suède)
- L’Observatoire du Niger supérieur et du delta intérieur du Niger
  Abdouramane Gado Djibo (hydrologue), Mamadou Lamine Diawara (chargé SIG/GRN) and Eddy Wymenga (Wetlands International)
- L’approche par système d’information géographique participatif : vers une meilleure gouvernance des zones humides côtières, le cas du Flamant rose
  Lisa Ernoul et Alain Sandoz (Tour du Valat)

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
- 22,000 offprints, booklets and reports

A Resource Centre open to all

- On-site: in the Tour du Valat Library, Monday to Friday from 9 am to midday and from 1 pm 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, **www.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 collection;
  - consult thematic selections of documents from the collection;
  - 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 customised 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 collection that corresponds to the user's centres of interest…

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 : www.tourduvalat.centredoc.fr

Roberta Fausti,
ARCHIVIST AND LIBRARIAN

“ Promoting the fabulous documentary resources of our library and joining a team engaged in a really meaningful project, that's what attracted me to the Tour du Valat. I am curious about the many information sharing tools provided by Internet today and I like using them to help others learn about the countless research opportunities available. ”

Media

In 2016, Tour du Valat received extensive media coverage with more than 330 articles published in the written press and online, and also TV reports and radio shows.

The following themes were the most common:

- The homage to Luc Hoffmann, who passed away on 21 July 2016. Founder of the Tour du Valat, his legacy in the field of nature conservation is unanimously acknowledged.
- The study of the sexual displays of flamingos (based on the article written by Perrot C., *& al.,* published in Scientific Reports) received great attention from the media, especially internationally (Sciences & Avenir, Le Monde, the Daily Mail, and the New York Times).
- Mosquito control in the Camargue (second year of experimentations with TechnoBam traps) with two TV reports, a web TV report, and a radio show)
- The role of wildlife in the spreading of antibiotic resistances.
- The "Ponds and marshes of the former Camargue salt works."
- The Tour du Valat estate and Regional Natural Reserve in various articles about the Camargue (Géo, Terre Sauvage).
- The Tour du Valat's participation at the COP22 and MedCop Climat, where it reasserted the key role played by wetlands in mitigating climate change.
- The events organised by the Tour du Valat (the Young Scientists Conference and open doors day), or for which it was a partner (Camargue Festival, Great Camargue Adventure Race, and the national launch of World Wetlands Day).

The Tour du Valat 2.0!

The Tour du Valat has decided to increase its presence on the social networks. In 2016, our publications were consulted more than 250,000 times!

The following were among our most highly consulted and shared publications:

- The monitoring of ringed birds in the Camargue (spoonbills observed in Spain and South Sudan, and a Slender-billed Gull observed again Libya).
- The article and the press release "Bird populations in the Camargue: a more significant decline than estimated".
- The Tour du Valat's presence at the COP 22 in Marrakech.
- The Tour du Valat's participation at the IUCN World Nature Congress in Hawaii.
- The article and the press release "Impact of pesticides on wildlife: confirmation of the cocktail effect and the importance developmental stage".
- The second year of experimentations with anti-mosquito devices in Le Sambuc.
- The school in Le Sambuc was renamed Ecole Alan R. Johnson.
- And of course, our job offers!

Many of our partners also expressed their emotion and paid homage to Luc Hoffmann on the social networks.

Films

- La Tour du Valat, un laboratoire à ciel ouvert (The Tour du Valat, where Research meets Nature, 2016, made by Orca Production. French version: https://vimeo.com/207107844, English version: https://vimeo.com/207108428
- Le Rhône en Camargue (The Rhone in the Camargue), ARTE G.E.I.E, RTS, MONA LISA Production, Rhône productions, 2016, directed by Frédéric Miara and Stéphane Lefort. http://future.arte.tv/fr/le-rhone-en-camargue
- Métamorphoses (Metamorphoses), La Salamandre, 2016, directed by Sacha Bollet and Benoît Demarle. DVD, http://catalogue.salamandre.net
- Hommage à Luc Hoffmann - 19 August 2016, The Tour du Valat, 2016, made by Agence Caméléon. https://vimeo.com/198962381
- "Les zones humides littorales" Océanoplis, 2 February 2016, Talk in French by Jean Jalbert. https://youtu.be/L1US6sA2y1Q

Join us on :

Olivier Brunet,

PROJECT OFFICER IN THE ECOSYSTEMS DEPARTMENT

“ The Petit-Saint-Jean agro-ecological research initiative, which includes an agricultural system that is productive, sustainable and autonomous, and in harmony with natural ecosystems immediately caught my interest! Collaborating with numerous partners, I work to set up, maintain, monitor and assess the annual and perennial crops grown on site. ”

Thymio Papayannis,
became an Honorary Member of the Tour du Valat Foundation.

OUR ORGANISATION

Tour du Valat is a Non-profit Public Benefit 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.

2016 was above all marked by the disappearance of Luc Hoffmann, who founded the Station Biologique de la Tour du Valat in 1954. Twenty-four years later, in 1978, he created the appropriate legal structure to support its operations, the Tour du Valat Foundation, of which he was the President until 2004, and then the honorary President.

Even if its founder has disappeared, the Tour du Valat Foundation is still as solid and as stable as ever, guided by effective governance that guarantees it will pursue the vision of Luc Hoffmann while adapting to the challenges of tomorrow.

The Advisory Board has been significantly renewed, since Lucien Chabason, who was an advisor at the IDDRI (Institute for Sustainable Development and International Relations) and Thymio Papayannis, who founded the MedWet Initiative, have left this body. To express its thanks to Thymio Papayannis for his 25 years of constant commitment to the governance of the Tour du Valat, the Board decided to name him as an Honorary Member.

The Board elected two women to fill these positions on the College of qualified individuals, who are both from the Mediterranean Basin and acknowledged for their expertise and commitment. Gordana Beltram is from the Slovenian Ministry of the Environment and Spatial Planning and President of the Mediterranean Wetlands Committee (MedWet/Com), and Clairie Papazoglou is a consultant from Cyprus, and a previous Director of BirdLife Cyprus.

Finally, the Science Council also experienced major changes: three eminent figures on this body, Pat Dugan, Jean-Claude Lefeuvre, and Jean-Dominique Lebreton, who long accompanied the Tour du Valat, left it after their second term.

We would like to express our deepest gratitude to them.

Budget

THE BUDGET FOR THE YEAR 2016 AMOUNTS TO 5,324,000 EUROS

Expenditure

- **3,466,000** euros have been allocated to the scientific programmes, including **855,000** euros for the "Conservation of species and their populations in the context of global changes" department, **1,412,000** euros for the "Ecosystem modelling, restoration and management" department, **394,000** euros for the "Monitoring and evaluation & wetlands policies" department, **428,000** euros for the management of the estate, and **377,000** euros for shared scientific activities (scientific management, conferences, training, transfer, project development, etc.).
- **430,000** 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.).
- **75,000** euros have been allocated to managing the Tour du Valat library, principally the purchase of books and scientific journals.
- **1,353,000** 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:

- **14 %** from its own funds, held by the Pro Valat Foundation (752,000 €).
- **25 %** from partnership agreements with public organisations (1,340,000 €).
- **49 %** from the MAVA Foundation (2,600,000 €).
- **7 %** from partnership agreements with other private organisations (376,000 €).
- **5 %** are revenues from the estate (256,000 €).

Expenditures in euros

- Scientific programmes **3,466,000**
- General management / Communication **430,000**
- Library **75,000**
- Ancillary services **1,353,000**

Total : 5,324,000

Receipts in euros

- Core funds **752,000**
- Agreements with private organisations **2,976,000**
- Agreements with public organisations **1,340,000**
- Revenues from the Estate **256,000**

Total : 5,324,000

Governance

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
- Corinne Tourasse . . . . . PACA Regional Director for Environment, Planning and Housing, representing the Ministry of Environmental Transition
- 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, Secretary - MedWet Senior Advisor, President of MedINA
- Clairie Papazoglou . . . . . European policies consultant for NGO (Chypre)

SCIENCE COUNCIL

- Dr Patrick Dugan . . . . . President - WorldFish Centre, Penang (Malaysia)
- Dr Patrick Duncan . . . . . CNRS, Chizé (France)
- Dr Jean-Dominique Lebreton Vice-président - Centre d'écologie fonctionnelle évolutive / CNRS, Montpellier
- Pr Jean-Claude Lefeuvre . . Muséum National d'Histoire Naturelle and University of Rennes (France)
- Dr Laurent Mermet . . . . . ENGREF, Paris (France)
- 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 Thoye . . . . . 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. That is the guiding principle of our eco-responsible process, developed in several areas:

- managing our infrastructures with respect to the use of renewable energies and the management/repurposing of our waste;
- adapting our transport methods to reduce our ecological footprint;
- adopting an agro-ecological approach to our agricultural production;
- optimising our consumption habits and behaviour.

TODAY, ECO-RESPONSIBILITY AT TOUR DU VALAT IS:

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

- The energy consumption of our buildings has been halved after the work carried out to insulate them with rice straw and cellulose insulation, and to replace some window units by efficient double-glazing;
- Our CO2 emissions have been divided by six thanks to our wood-fired heating system – with the wood partly produced at the Tour du Valat – and the installation of a 160 kW multi-fuel biomass boiler (replacing five fuel oil or gas-fired boilers that totalled 580 kW), combined with a 590-metre heating network and seven substations at the inlet to each building.

Transport policy

- Optimising home-to-work commuting by organising car-sharing arrangements and financially assisting the use of public transport by purchasing a vehicle for journeys between the Tour du Valat and the nearest bus stop;
- Our car fleet is currently being redesigned by reducing the number of vehicles and acquiring a single model, with low fuel consumption and maintenance costs;
- Prioritising non-polluting means of transport on the Estate by acquiring electric service vehicles, e-bicycles and mountain bikes;
- Reducing national and international trips by prioritising the use of tele- or video-conferencing, and the use of less expensive, low-ecological-footprint means of transport.

Production & consumption

- 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 11 years; the high-quality meat produced is commercialised on a local supply chain basis;
- 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 canteen prioritises organic, locally produced, seasonal ingredients, using short supply chains and solidarity-based economic principles; it regularly provides vegetarian meals, proscribes species whose stocks are threatened, and limits and repurposes waste.

Finally, the Tour du Valat Works Council supports the bulk purchases of cleansing products, rice, olive oil and citrus fruits, all labelled Organic Agriculture.

Claudia Mihai,
CLEANING TECHNICIAN

“ I arrived at the Tour du Valat two years ago and I feel good here … even if I sometimes have to use some very creative camouflage to do the cleaning at the Tour du Valat. ”

OUR LIFE-BLOOD

The next generation is arriving! In response to the retirements of several of our senior scientists, in late 2015 and throughout 2016 we recruited several young scientists. Delphine Nicolas is a researcher in fish conservation biology who will continue Alain Crivelli's research and undertake her own projects. Hugo Fontes was hired as a project engineer in the Ecosystems Department to replace Nicole Yaverkovski, while Ilse Geijzendorffer has joined the MWO Department as a research scientist. Marion Vittecoq and Jocelyn Champagnon, who started working at Tour du Valat several years ago, are currently running the Species Department while Arnaud Béchet is completing research in Quebec.

Yannick Michelier, a technician on the estate, had his contract extended and Kamel EL Bachir, who works in the accounting department, is now a permanent employee. Thanks to the civil service framework, in 2016 the Tour du Valat was also able to offer seven young and dynamic individuals the chance to become "wetland Ambassadors."

The works council was also renewed and a new single entity for the staff made up of three bodies (a works council, staff delegates, and a health, safety and working conditions committee) was set up.

All of these changes have greatly contributed to a more dynamic work atmosphere and working relationships within the programmes and services.

In 2016, the Tour du Valat team included 80 employees, three doctoral students who defended their thesis, and five doctoral students with an outside contract, for a total of 71.5 full-time equivalent employees.

28 interns and a European volunteer contributed their enthusiasm and precious assistance to the scientific projects being developed at Tour du Valat.

**"To all of you, a big THANKS from the mediterranean wetlands,
their cohorts of species… and all their inhabitants."**

Us

- 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, HEAD OF DEPARTMENT
- Dr Jocelyn Champagnon
  RESEARCH SCIENTIST, COORDINATION
- Dr Marion Vittecoq
  RESEARCH SCIENTIST, COORDINATION
- Antoine Arnaud
  RESEARCH TECHNICIAN
- Thomas Blanchon
  RESEARCH TECHNICIAN
- Pascal Contournet
  RESEARCH TECHNICIAN
- Dr Alain Crivelli
  RESEARCH DIRECTOR
- Laura Dami
  PROJECT LEADER
- Clémence Deschamps
  PROJECT OFFICER
- Charlotte Francesiaz
  PHD, UNIVERSITY OF MONTPELLIER (CO-FUNDING SIBAGHE)
- Christophe Germain
  RESEARCH ASSISTANT
- Yves Kayser
  RESEARCH ASSISTANT
- Dr Delphine Nicolas
  RESEARCH SCIENTIST
- Claire Pernollet
  PHD, UNIVERSITY OF MONTPELLIER (CO-FUNDING ONCFS)
- Charlotte Perrot
  PHD, UNIVERSITY OF MONTPELLIER (CO-FUNDING TOUR DU VALAT/MONTPELLIER SUPAGRO)
- Émeline Sabourin
  PHD, UNIVERSITY OF MONTPELLIER (CO-FUNDING TOUR DU VALAT/LABEXCEMEB)
- Dr Alain Sandoz
  RESEARCH SCIENTIST
- Benjamin Folliot
  PHD, UNIVERSITY OF MONTPELLIER (CO-FUNDING ONCFS)

Ecosystem modelling, restoration and management department

- Dr Brigitte Poulin
  HEAD OF DEPARTMENT, RESEARCH SCIENTIST
- Nathalie Barré
  RESEARCH ASSISTANT
- Nicolas Beck
  PROJECT LEADER
- Dr Olivier Boutron
  RESEARCH SCIENTIST
- Olivier Brunet
  PROJECT OFFICER
- Julie Campagna
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  PROJECT LEADER
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Civic services "Coup de coeur"
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  DEPUTY DIRECTOR OF THE ESTATE
- Dimitri Gleize
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- Marion Lourenço
  TECHNICIAN – GUARD
- Yannick Michelier
  ESTATE TECHNICIAN
- Ludovic Michel
  ESTATE TECHNICIAN
- Elvin Miller
  TECHNICIAN - GUARD
- Anthony Olivier
  TECHNICIAN - GUARD

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  COOK
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  SECRETARY
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  ACCOUNTANT
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  LIBRARIAN
- Rosalie Florens
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- Cécile Girard
  CLEANING OFFICER
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  COMMUNICATION OFFICER
- Emmanuel Thévenin & Evanne Lefur
  PROJECT LEADERS SECONDED TO GIP ATEN

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European Voluntary Service

- Tatiana Fuentes

Erasmus+

Civic services

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Fixed term contracts (short period)

- Julien Birard, Claire Bignon, Mohamed Dahmich, Sophie Guingand, Kévin Huppert, Céline Kehringer, Thibault Oudart, Claire Pernollet, Ana Elena Sanchez de Dios Rodriguez.

Support the activities of the Tour du Valat

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.

JOIN THE ASSOCIATION "FRIENDS OF TOUR DU VALAT

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 is download the membership coupon from our website:

www.tourduvalat.org/support

or contact us for further information at:

amis@tourduvalat.org / amistourduvalat

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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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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.

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.

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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

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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.

Our Partners and Sponsors

Partnerships, keystone of our action

Providing realistic responses to issues in the Mediterranean region, promoting and implementing integrated management processes, mobilising the most pertinent expertise, and financing projects-all our actions require the development of strategic relations with various organisations. Today our actions are carried out with more than 300 partners (research centres, NGOs, and governmental or supra-governmental organisations, fundations) established around the Mediterranean basin. The creation of those strong partnerships is key to attaining our objectives, and we hereby wish to thank all our partners and sponsors.

MAVA FONDATION POUR LA NATURE

Created by Luc Hoffmann in 1994, the mission of the MAVA Foundation is to establish solid partnerships in order 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.

FONDATION PRINCE ALBERT II DE MONACO

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

CAISSE D'EPARGNE PROVENCE - ALPES - CORSE

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.

FONDATION TOTAL

Continuing the partnership initiated ten years ago, this year the Total Foundation has contributed to our Greater Flamingo research programme, the monitoring of Slender-billed Gull, a modelling project for the site of the former salt-work in Camargue, biodiversity monitoring in the marshes, and supporting the Mediterranean Wetlands Observatory.

fondation gecina

A new partner for the Tour du Valat, the Gecina Foundation provides support for the Résifaune Health Ecology project, whose aim is to achieve a better understanding of the role played by wildlife in the circulation of antibiotic-resistant bacteria through studying the bacteria carried by rodents and gulls in various Camargue habitats.

Fondation de France

The Foundation of France supports the Tour du Valat in two multi-disciplinary research projects: one favouring a social and human approach, using the Greater Flamingo to develop a participative Geographical Information System, the other aiming at developing an agro-ecological window-site on the Petit Saint Jean Estate, in the Camargue Gardoise, through the use of agricultural production systems.

© Tour du Valat

After burying power lines that cross the Tour du Valat Regional Natural Reserve, an agreement was signed to promote this kind of action and to provide biodiversity training for ENEDIS agents. The Greater flamingos programme was supported by the “oxygen” challenge.

In the framework of a global partnership, WWF works with Coca-Cola in its "Replenish" Programme. The aim is to give back to human communities and nature a volume of water equivalent to that used for the worldwide production of drinks. In France, this commitment has resulted in a partnership between Coca-Cola and WWF-France in a project based on improving hydraulic and biological exchanges at the Camargue Salt Works Lagoons and Marshes, which is joint-managed by the Tour du Valat, the Conservatoire du Littoral (Coastal Protection Agency), the Camargue Regional Natural Park, and the National Nature Protection Society. The Tour du Valat is responsible for coordinating the actions carried out in the framework of this project, which is based on the site management guidelines.

The Klorane Institute, a company foundation for the protection and promotion of botanical heritage, and the Tour du Valat Foundation have many points in common. They are both the work of visionary individuals committed to a harmonious relationship between Humanity and Nature: Pierre Fabre and Luc Hoffmann, who knew each other and got on well. The two foundations have the intention to collaborate on the creation of a sketchbook of Camargue flora, and the cultivation of European searocket, Cakile maritima, in the context of an agro-ecology project on the Petit Saint Jean Estate.

The Oak Foundation, which focuses its actions on social and environmental issues of worldwide importance, made a contribution to the Tour du Valat programme to acknowledge the exceptional contributions of Luc Hoffmann, who passed away in July.

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 complete scientific actions in wetland areas.

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.

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. During the three years of his doctoral research, Antoine Gazaix will conduct experimentations in controlled conditions and test management methods in order to make some recommendations. This project falls within the framework of the accompanying measures for the construction of a high-speed train line.

© Tour du Valat

The Heritage Foundation supports an agroforestery and agroecology project on the Petit Saint-Jean estate, which aims to develop a showcase site for permaculture, by planting berry hedges and digging ponds, to create a model for the farming of tomorrow.

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

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.

Hosted organisations

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

Association Friends of Tour du Valat

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: www.tourduvalat.org/support

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

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 effective 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

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

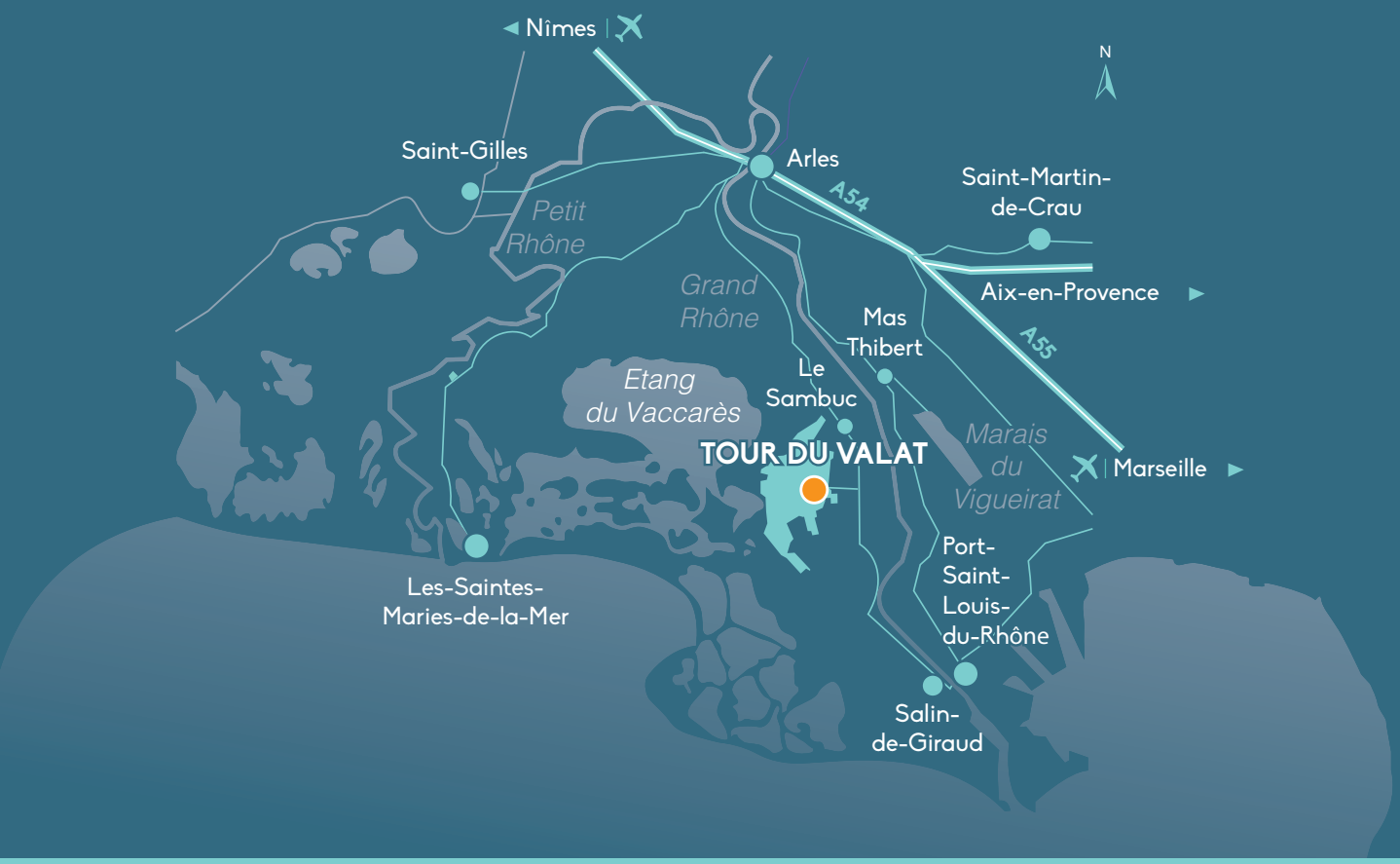
- If you wish to receive information about the programmes and other events organized at the Tour du Valat for the general public, please contact us at:

  secretariat@tourduvalat.org

- Follow us on:

  @TourduValat / Tour du Valat

  www.tourduvalat.org



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