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CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE
AND NATURAL HABITATS

Standing Committee

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**REPORT
OF THE VISIT OF THE INDEPENDENT EXPERT
TO THE CAMARGUE NATIONAL NATURE RESERVE
(France)**

20-22 September 2022

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Introduction

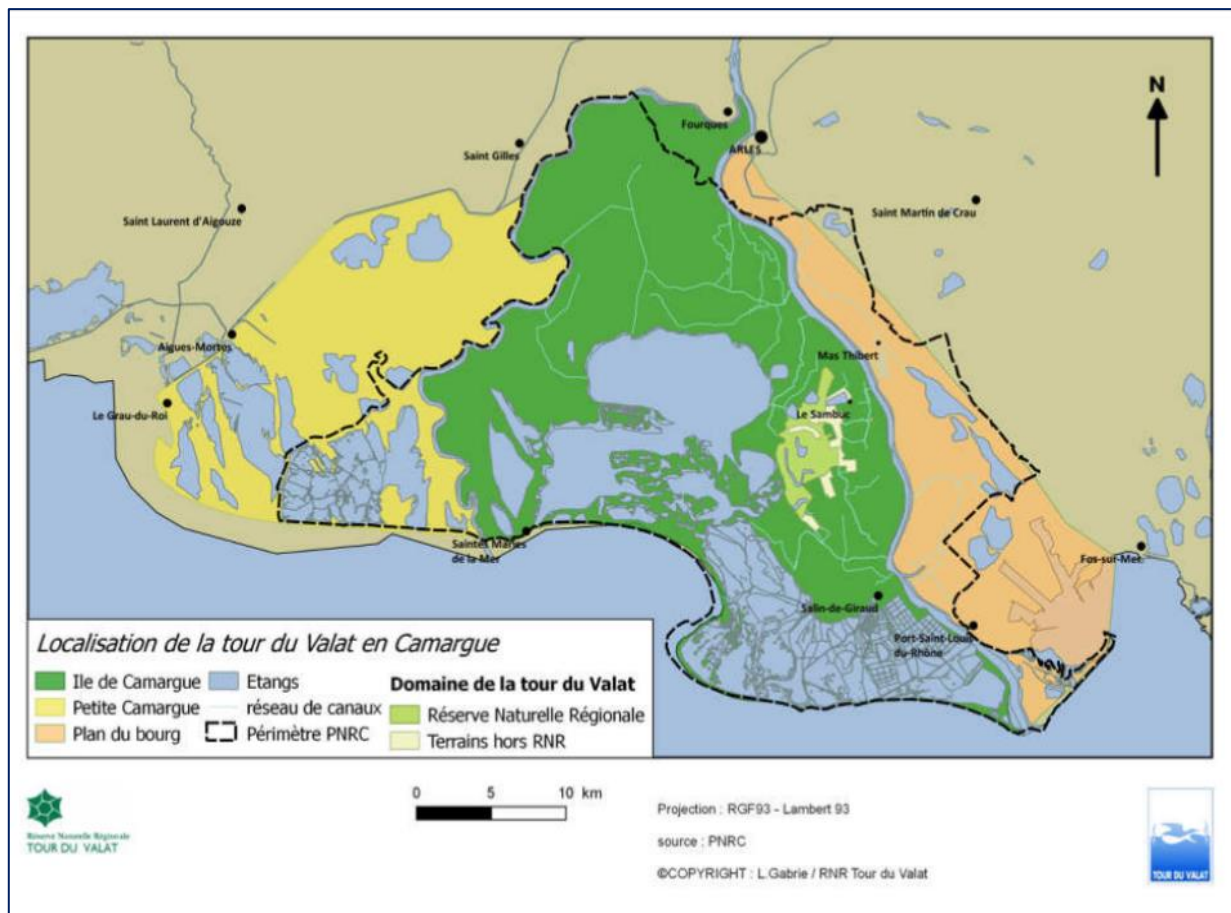
The European Diploma of Protected Areas was awarded to the Camargue National Nature Reserve (RNNC), one of the oldest and best protected in France, on 27 March 1966 (Resolution (66)22). It has been regularly renewed since then, most recently for 10 years in 2011 following the visit by Mr Bernard Jacquat in September 2010. Due to the Covid 19 pandemic, the 2020 and 2021 missions were postponed and the validity of the diplomas extended until 2024.

The mission was finally able to go ahead in 2022; the on-the-spot appraisal, which is the subject of this expert report, was carried out on 21 and 22 September. It was conducted at the offices and in the field by the reserve's Director, Mr Gael Emery, and was impeccably organised. My thanks go to Mr Emery and his team for the very able manner in which the visit was organised, and to everyone else who contributed. The list of participants is attached hereto.

Situation: the National Reserve in its regional context

The Camargue in the broad sense, meaning the area formed by the ancient Rhone delta, covers a vast territory that lies within two *départements*, Bouches du Rhône and Gard. The Grande Camargue is the triangle located between the Lesser and the Greater Rhone; the Petite Camargue, or Camargue gardoise, is the part located to the west of the Lesser Rhone.

The Grande Camargue, or “Ile de la Camargue”, covers an area of about 200 000 ha; 150 000 ha are cultivated, of which approximately 50 000 ha are rice fields.



[Localisation de la tour du Valat en Camargue = location of the tour du Valat in Camargue]

[Ile de Camargue = Ile de Camargue]

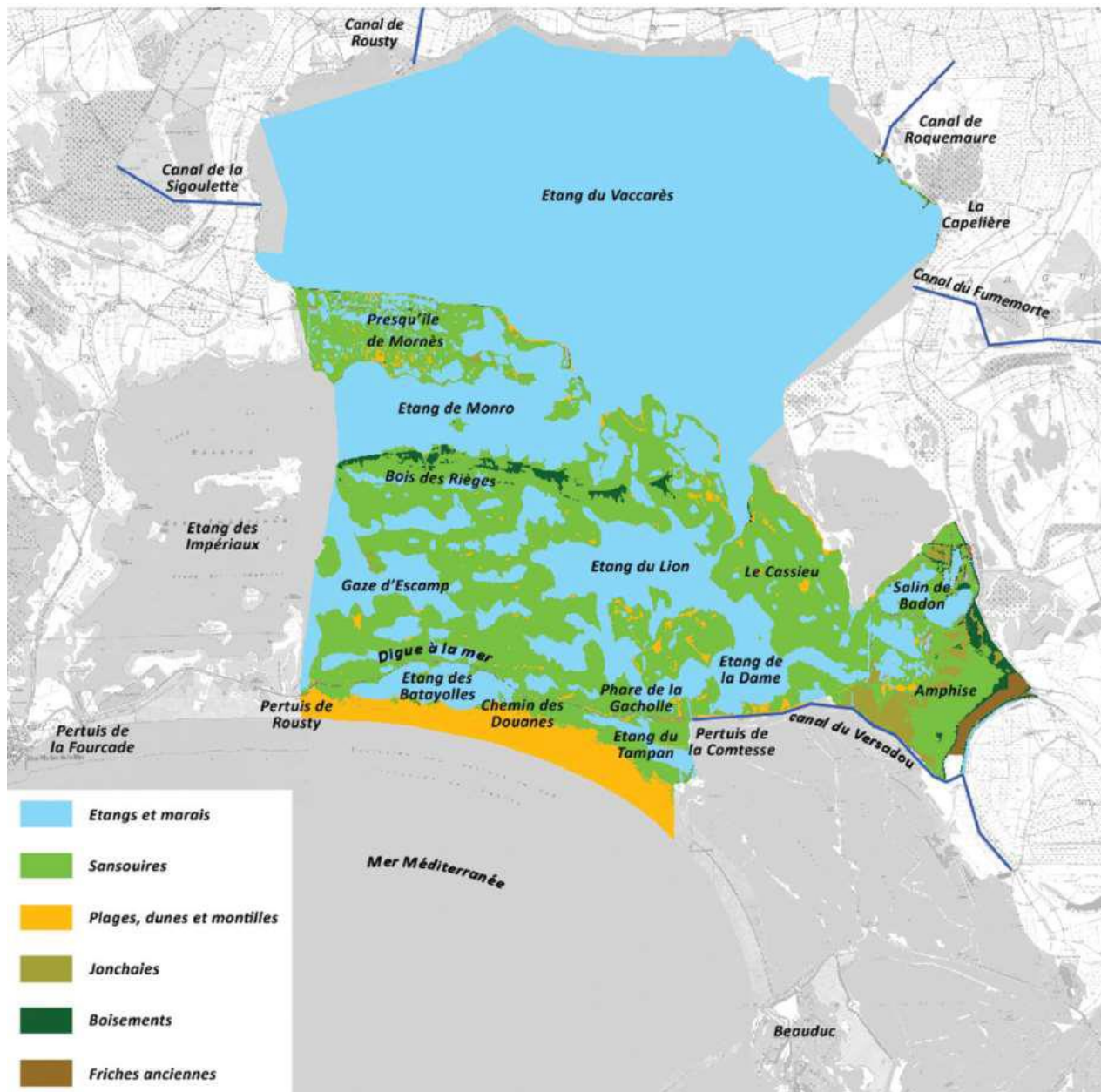
[Petite Camargue = Petite Camargue]

[Plan du bourg = Plan du bourg]

[Etangs = Lagoons]

[réseaux de canaux = canal networks]
 [Périmètre PNRC = perimeter of the Camargue Regional Nature Park]
 [Domaine de la tour du Valat = Tour du Valat estate]
 [Réserve Naturelle Régionale = Regional Nature Reserve]
 [Terrains hors RNR = land outside the Regional Nature Reserve]

The whole of the Camargue has been profoundly altered by humans, particularly following the damming of the Rhone starting in the mid-19th century. The Camargue National Nature Reserve (RNNC) forms the core of the Grande Camargue and is the part least affected by human activity. It enjoys very high protection status and considerable fame, especially among ornithologists. It covers an area of 13 232 ha.



[Etangs et marais = Lagoons and marshes]
 [Sansouires = low-lying salt plains]
 [Plages, dunes et montilles = Beaches, dunes and "montilles" (ancient fossilised dunes)]
 [Jonchaies = rush beds]
 [Boisements = wooded areas]
 [Friches anciennes = abandoned land]

Lagoons make up most of the territory of the reserve; the Vaccarès alone covers about 70% of its surface area. The lagoons, which are all interconnected, are separated from the sea by a man-made structure called "La

Digue à la Mer” or sea dyke. It is traversed at both ends by “pertuis”, i.e. openings equipped with gates to control hydraulic exchanges between the lagoons and the sea. The habitat is brackish, but subject to very significant variations in salinity. The national reserve extends, as it were, into other adjacent or nearby reserves (Tour du Valat, Marais du Vigueirat, Bouches du Rhône *département*), and land acquired over the years by the Conservatoire du Littoral, and which the RNNC is responsible for managing.

The reserve has a flat topography, the level of which varies according to the season by a few tens of cm, below and above sea level.

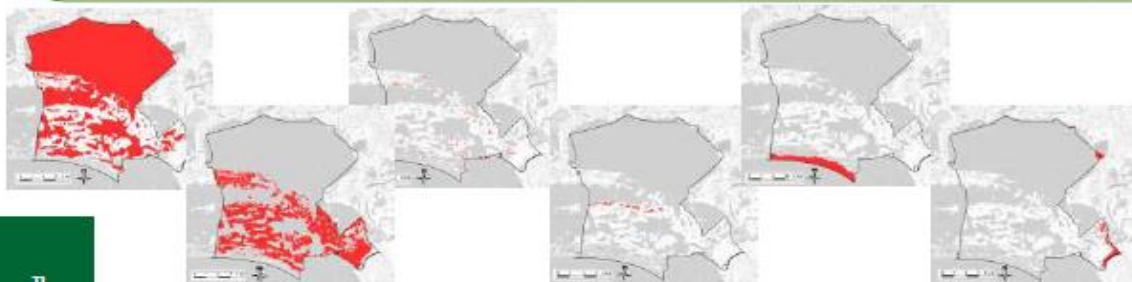
Value and European interest of the site

The natural and heritage assets of the Camargue are well known. They have been described in detail in the application form and in the reports on previous visits. We will simply summarise here the main habitat types as described in the management plan:

The Vaccarès forms the “centrepiece” of a vast lagoon system located in the heart of the Rhone delta, evolving in constant interaction with the neighbouring sites belonging to the Conservatoire du Littoral (Mas Neuf du Vaccarès, Grandes cabanes and the Étangs et marais des Salins de Camargue) and the département (Étang des Impériaux). Several thousand species flourish in the unique conditions that this preserved coastal wetland has to offer, with its omnipresent water and salt, tranquil setting and biological interactions.

Flat does not mean homogeneous. No fewer than 33 habitats, most of them either flooded or prone to flooding, intertwine across the landscape:

- **Lagoons** dominate the surface, with the Vaccarès lagoon, the so-called “lower” lagoons (Lion, Dame, Monro and part of the Impériaux), and the lagoons south of the sea dyke.
- The “sansouïres”, temporarily flooded salt flats, reveal low scrubland whose colours change according to the seasons. The accumulation of salt during dry periods is apt to form a white crust on the surface of the ground.
- The Mediterranean-type **salt marshes and saline steppes** are drier.
- The dune system combines embryonic dunes on the sea side, white dunes and fixed dunes.
- Fragile **Mediterranean grasslands** have developed on the small, flattened dunes known as “montilles”.
- A string of **woodlands** is home to Phoenician juniper trees, some of them several hundred years old.



[ENJEU DE CONSERVATION : les CIBLES de CONSERVATION = CONSERVATION CHALLENGE: CONSERVATION TARGETS]

[Lagune et baisses = Lagoon and flats]

[Sansouïres et jonchaies = “Sansouïres” and rush beds]

[Pelouses = grasslands]

[Dunes littorales à Juniperus = coastal dunes with junipers]

[Littoral = seashore]

[Milieux d’origine fluvio-lacustre = fluvial and lacustrine habitats]

The site is of great international importance for wintering water birds, in particular for 7 species of ducks (wigeon, gadwall, mallard and shoveler, green-winged teal, ruddy duck and greater scaup) and the common coot. It is famous for its population of flamingos.

The lagoons are home to nearly 40 species of fish, including the European eel, the Rhone shad and the common goby, the most threatened bony fish in the Mediterranean.

More generally, insects (Diane butterfly, dark spreadwing (*Lestes Macrostigma*), etc.), amphibians (spotted pelodyte), reptiles and small mammals make up a diverse fauna.

Boundaries and protection systems

Numerous protection mechanisms have been put in place over the years; together they form a highly complex system, with overlapping, partially overlapping or adjacent zones.

The National Reserve forms the core of the system. It is long-standing, having been created in 1927, and covers an area of 13 232 ha; it enjoys exceptionally high protection status within the French nature reserve system, equivalent for all intents and purposes to IUCN category Ia (no human activities, only a handful of routes open to visitors, no hunting or fishing). It is the National Reserve that holds the European Diploma. Under an agreement, the reserve manages the areas acquired by the Conservatoire du Littoral, outside the perimeter. The Conservatoire du Littoral continues to make purchases, as and when the opportunity arises. The territory actually protected is thus almost double that of the RNNC.

The Camargue also includes other reserves, such as the Tour du Valat (adjacent to the RNNC) and Marais du Vigueirat reserves.

The Grande Camargue (between the two branches of the Rhone) along with a strip of territory to the NE, is a regional nature park or “PNR”, the Camargue Regional Nature Park. It covers parts of the territory of three *communes*. Unfortunately, the park is not functioning very satisfactorily and is currently unable to perform the unifying role that it ought to play.

The whole of the Camargue in the broad sense, including a large marine area and an area in the Gard *département*, constitutes the Camargue Biosphere Reserve (BR). It covers 348 211 ha (core zone: 38 266 ha; buffer zone: 140 324 ha; co-operation zone ha: 169 621). The RNNC, together with the land owned by the Conservatoire du Littoral and the Tour du Valat, makes up the bulk of the core zone.



[CARTE DE LA RESERVE de la Biosphère de Camargue = MAP OF THE CAMARGUE BIOSPHERE RESERVE]

[RESERVE de la Biosphère de Camargue = Camargue Biosphere RESERVE]

[Périmètres communaux = Municipal boundaries]

[Zone centrale = Central zone]

[Zone tampon = Buffer zone]

[Zone de coopération = Co-operation zone]

[Mer Méditerranée = Mediterranean Sea]

It should be noted that the Regional Nature Park and the Biosphere Reserve have a joint scientific committee that currently works well. These two structures could, however, play a major role for the whole of the Camargue, which they are not doing at present.

Finally, 85 000 ha in the middle of the delta constitute the Ramsar site of the Camargue; at long last, ideas are being floated about the possibility of creating a National Park!

Administration and finances

The reserve's 13-strong team shares various tasks related to the management of its vast protected territory:

- protection (surveillance, maintenance, etc.) provided by wardens/technical support staff who also participate in the monitoring operations;
- scientific monitoring (counting, sampling, data processing, etc.) carried out by scientific officers;
- visitor information and educational activities carried out by an education officer, wardens/instructors and a team of volunteers from the national nature protection association, *Société nationale de protection de la nature* (SNPN).

The administrative side is handled by a director (personnel management, communication, advocacy, etc.) and an administrative assistant (accounts, human resources etc).

Ownership of the land has been transferred to the Conservatoire du Littoral and the management entrusted to the SNPN. The operating budget for 2010 came to over €620 000. The DIREN contributes €475 000, with the

Provence, Alpes, Côte d'Azur (PACA) region and the SNPN providing the rest. Capital expenditure totalling over €178 000 is covered by the Conservatoire du Littoral and the regional authorities.

Funding is sufficient to ensure day-to-day management. However, large-scale initiatives, such as the plan to rescue the Vaccarès lagoon (see below), require significant resources and active support at every level (local, regional and national).

Governance of the Reserve and Management Plan

The reserve is managed by the *Société nationale de protection de la nature* (SNPN), on behalf of the State. This association ran the reserve before it was even designated as a national nature reserve in 1975 and indeed as far back as 1927 when the reserve first came into being.



[SON ORGANISME DE TUTELLE - L'ETAT ITS SUPERVISORY BODY – THE STATE]

Direction régionale de l'Environnement, de l'Aménagement et du Logement =
Regional Directorate of the Environment, Development and Housing]

[Les parcelles de la Réserve deviennt propriété de l'Etat en 1972 =
The parcels which make up the reserve were acquired by the State in 1972]

[Arrêté de création de la RNNC 24 Avril 1975 = Decree establishing the RNNC, 24 April 1975]

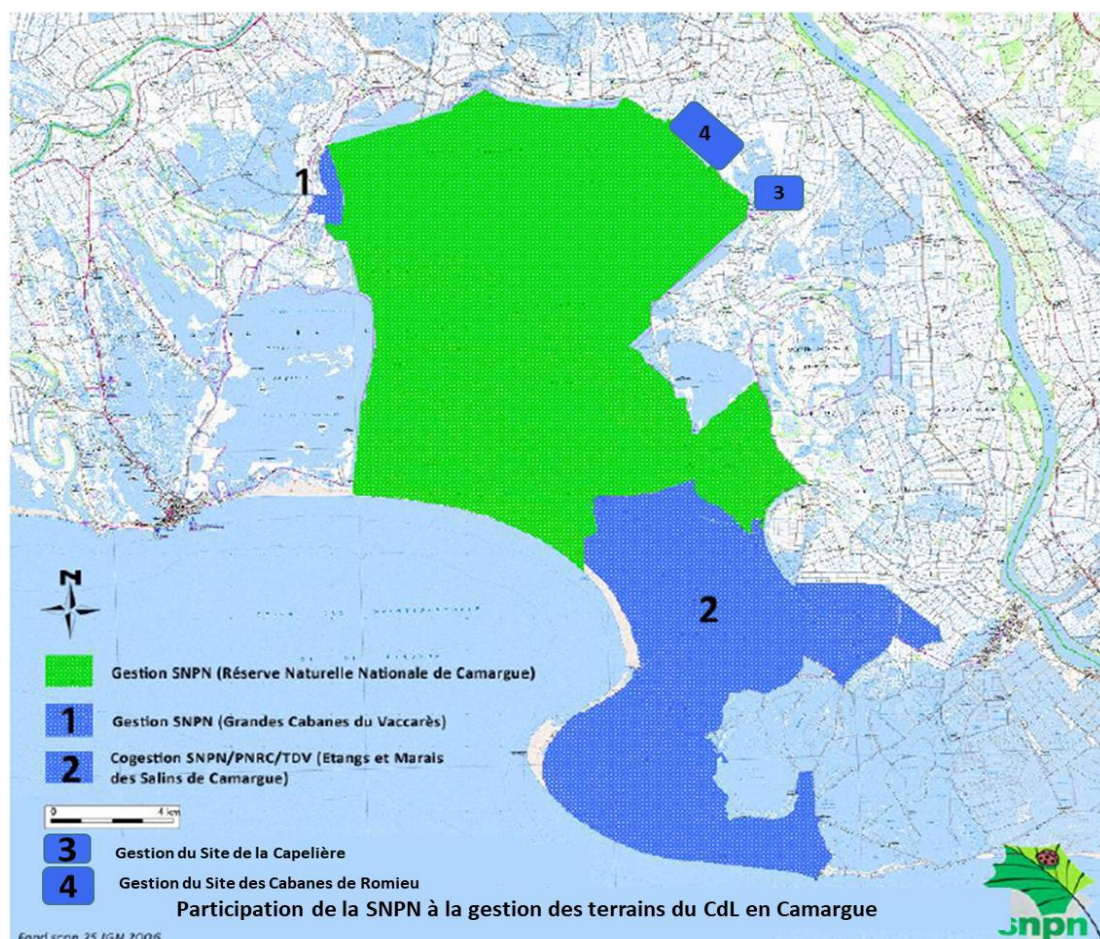
[Arrêté de gestion de la RNNC 24 Avril 1975 = Decree concerning the management of the RNNC, 24 April 1975]

[Convention de gestion Etat/SNPN 4 mars 1986 = Management agreement between the State and the SNPN, 4 March 1986]

The RNNC management policy is updated every 5 years and is set out in an official document, the management plan, approved by the DREAL. **The 2016-2020 management plan is the RNNC's 6th management plan.**

The parcels which make up the Camargue National Nature Reserve (469) were acquired by the State in 1972 and recorded in the general table of government assets. The largest parcel is located on the Vaccarès and represents 5 887 ha, or nearly half of the surface area of the Camargue National Nature Reserve. **In 2006, the site was permanently assigned to the Conservatoire du Littoral** (by order of 16 June 2006), which still owns the Camargue National Nature Reserve today.

As well as the areas within the reserve, the SNPN is also responsible for managing some additional areas (shown in blue on the map below), which likewise belong to the Conservatoire du Littoral.



[Gestion SNPN (Réserve Naturelle Nationale de Camargue) =

SNPN management (Camargue National Nature Park)]

[Gestion SNPN (Grandes Cabanes du Vaccarès) =

SNPN management (Grandes Cabanes du Vaccarès)]

[Gestion du Site de la Capelière = Management of the Capelière site]

[Gestion du Site des Cabanes de Romieu = Management of the Cabanes de Romieu site]

[Participation de la SNPN à la gestion des terrains CdL en Camargue =

SNPN's participation in the management of Conservatoire du Littoral land in the Camargue]

Pursuant to the Environment Code (Article R332-18), the reserve's **Scientific Council (SC)**, which is reappointed every five years by prefectural decree, provides advice and expertise to the Prefect and the reserve's manager. **It is consulted about the management plan and can be asked for advice on any matter of a scientific nature concerning the reserve.** It provides external, scientific opinions to inform the managers' decisions as to the best means of intervention in the various habitats. Members of the Scientific Council can also make recommendations on what needs doing as a matter of priority (for example regarding the development of monitoring protocols).

Management plan

The current management plan for the Camargue National Nature Reserve covers the period 2016-2020. It was extended by prefectural decree until December 2022. This extension was granted owing to special circumstances arising in the last few years: the director's prolonged absence from March to September 2018 and then again in 2020, the appointment of an acting manager and, lastly, the change of management in June 2021.

The task of updating the Management Plan began in January 2022. The intention is not to overhaul the entire document, since a significant amount of diagnostic and restructuring work was carried out as part of the last

review, and the goals set remain valid. The idea of this review is rather to adapt the action plan to the changing context and, in particular, to prioritise what needs to be done.

A qualitative assessment of the 2016-2020 management plan was carried out by an external consulting firm. Taking that as a basis, the reserve team is in the final stages of drafting a new action plan for the management of the reserve, which will be valid for 5 years, ahead of a full review in 2027 for a 10-year extension.

An operational evaluation in preparation for the Management Plan review

The evaluation of the RNNC's 2016-2020 management plan is based on:

- Quantitative data available from the reserve
 - Annual reviews of action taken (2016 to 2020).
 - Number of full-time posts reviewed and actually filled per year, proposed budgets and grants received per year. These data are available in aggregate on an annual basis but are not broken down by target, objective or activity.
 - Values for the majority of the planned output/outcome indicators to monitor the strategic objectives.
 - The botanical expertise report (quantitative and qualitative data) carried out by Nicolas Borel, member of the Scientific Council, in 2017 (which relates to the entire reserve, with specific parts for certain targets)
- Qualitative data, to compensate for the lack of quantitative data:
 - Self-assessment grids sent to reserve staff and Scientific Council members (see details below).
 - The – in some cases - estimated values for indicators of the conservation status of the targets: gleaned from annual activity reports, and mainly through interviews with the contact persons for the targets (no formal monitoring of the status of targets).
 - The current status of the targets, according to expert opinion when the value of the conservation status indicators was either not available or not sufficiently conclusive.
 - Information on the success or failure of the various activities carried out.

General conclusion of the evaluation

The evaluation of the 2016-2020 management plan shows that the reserve is heavily involved in scientific activities to advance the knowledge, monitoring and management of the iconic habitats of the Camargue. The reserve is recognised by its partners in these areas and its activities contribute to the conservation or restoration of the Camargue habitats. These activities, however, are not enough to successfully address all the threats to the area, as the degradation of the key target “Lagoons and flats” demonstrates.

This observation underlines some facts of which the manager and his partners are well aware:

- The issues extend beyond the direct reach of the reserve (e.g.: pollution of the catchment area impacting the quality of the water in the Vaccarès lagoon).
- The staff is not sufficiently large and lacks the necessary skill set to tackle all the objectives set by an ambitious management plan on their own.
- Updating the management plan is an opportunity to question the reserve’s strategy and to position it as a key regional player at the heart of the management of the Camargue, beyond its recognised scientific role.
- There is a need to prioritise interventions, in conjunction with the Scientific Council:
 - Identify or confirm the objectives by target and the main levers to be used to monitor and improve the state of the Vaccarès, and then focus first and foremost on these activities.
 - Identify the most important types of monitoring and use appropriate protocols to assess the status of the targets and steer the management of the reserve (some of this could be delegated).
- Responsibilities should be shared: specify, in consultation with the other partners, “who should do what” to achieve the reserve's overall objectives, beyond its boundaries.
- In terms of educational activities and outreach, it is important to mobilise resources for:

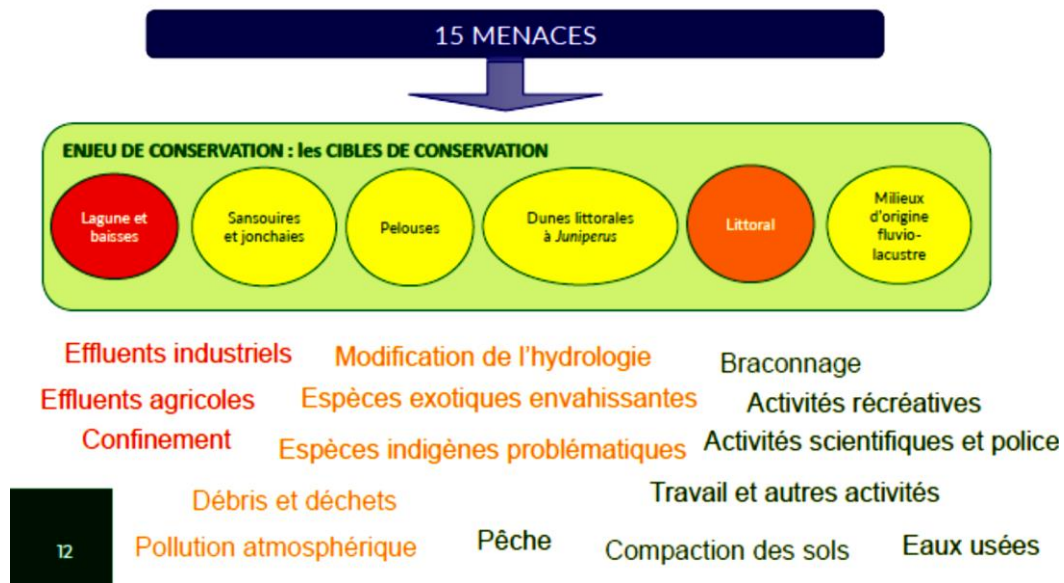
- local initiatives, which are essential to ensure implementation of the collective measures needed to improve water quality, in particular;
- public information and outreach, which is one of the 3 objectives of nature reserves but on which little emphasis has been placed in the current management plan.

Summary of the conservation status of the various habitats (conservation targets) and threats

An uncompromising assessment was made on the basis of existing data. Of particular note is the worrying state of the lagoons and flats (water level, increasing salinity, pollution), and also of the grasslands (bush encroachment).

Table 20: Overview of the status of the various conservation targets

CONSERVATION TARGET		INITIAL CONSERVATION STATUS (2016)	CONSERVATION STATUS ENVISAGED IN THE MANAGEMENT PLAN	ESTIMATED STATUS IN 2021
LAGOONS AND FLATS		Fair	Good in 2027	Poor
SANSOUIRES AND RUSH BEDS		Very good	Very good in 2030	Very good in quantitative terms
GRASSLANDS		Poor	Good in 2030	Poor
COASTAL DUNES		Good	Good in 2030	Good
SEASHORE		Good	Good in 2030	Insufficient data to judge
FLUVIAL AND LACUSTRINE HABITATS	LA CAPELIERE	Fair	Good in 2025	Good
	SALIN DE BADON	Fair	Good in 2025	Fair
	REED BEDS OF THE VACCARES AND VIEUX RHONE	Good	Good in 2025	Good in quantitative terms
	WOODLANDS	Not specified	Good	Insufficient data to judge
	PONDS	Not specified	Good knowledge of the target by 2020	Insufficient date to judge
	ABANDONED LAND	Not specified	Good knowledge of the target by 2020	Insufficient date to judge



[15 MENACES = 15 THREATS]
 [ENJEU DE CONSERVATION : les CIBLES DE CONSERVATION =
 CONSERVATION CHALLENGE: CONSERVATION TARGETS]
 [Lagune et baisses = lagoon and flats]
 [Sansouïres et jonchaies = “sansouïres” and rush beds]
 [Pelouses = grasslands]
 [Dunes littorales à *Juniperus* = coastal dunes with junipers]
 [Littoral = seashore]
 [Milieux d’origine fluvio-lacustre = fluvial and lacustrine habitats]
 [Effluents industriels = industrial effluent]
 [Modification de l’hydrologie = alteration of the hydrology]
 [Braconnage = poaching]
 [Effluents agricoles = agricultural run-off]
 [Espèces exotiques envahissantes = invasive alien species]
 [Activités récréatives = recreational activities]
 [Confinement = confinement]
 [Espèces indigènes problématiques = problematic native species]
 [Activités scientifiques et police = scientific and policing activities]
 [Débris et déchets = debris and waste]
 [Travail et autres activités = work and other activities]
 [Pollution atmosphérique = atmospheric pollution]
 [Pêche = fishing]
 [Compaction des sols = soil compaction]
 [Eaux usées = waste water]

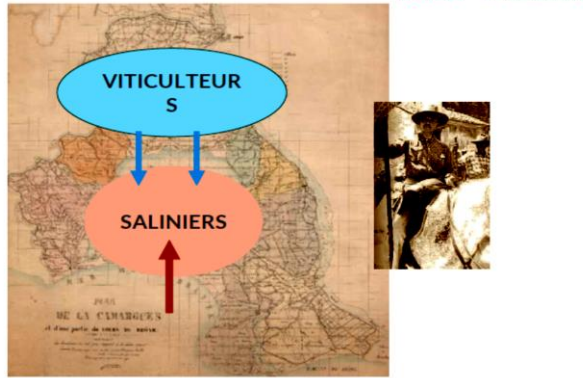
Agriculture (rice fields, market gardening) and its influence on the water regime (quantity and quality of water) is an exogenous factor but one that has a major bearing on the future of the reserve.

While not a serious threat, recreational activities do need to be kept under control (through patrols) and regularly monitored.

Hydraulic dynamics and climate change

The area encompassed by the reserve emerged as a result of territorial conflicts over water. Over time, the salt-making industry has markedly declined, while wine production has largely given way to rice fields and market gardening. The National Reserve lies at the interface of these two systems. Some agricultural areas are polderised while others are not and it is important that they be treated separately.

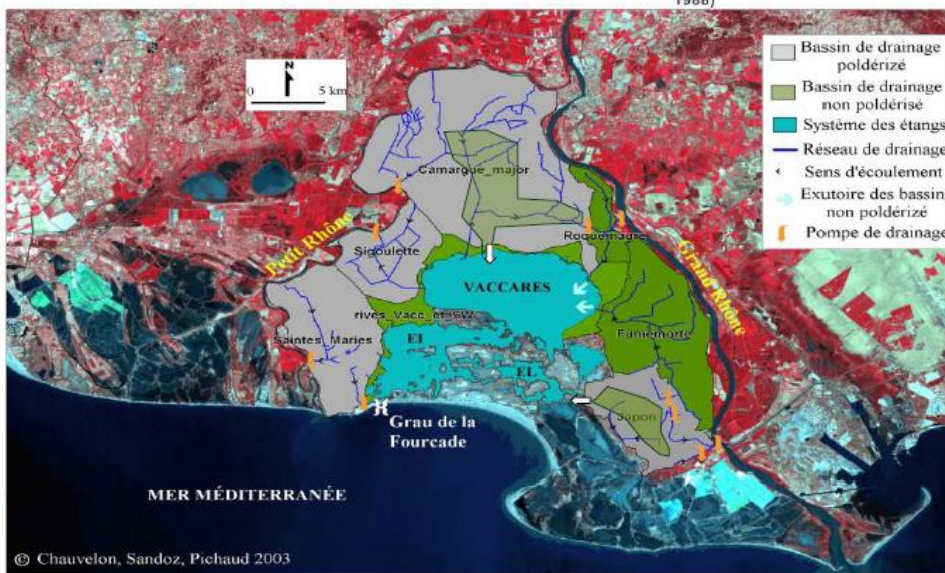
Monument culturel/naturel
 Mouvement félibréen
 Notion de « ceinture de nature éternelle » (f. De Baroncelli)



[Monument culturel/naturel = cultural/natural monument]
 [Mouvement félibréen = movement to promote Provençal customs and language]
 [Notion de « ceinture de nature éternelle » (f. De Baroncelli) = concept of a “permanent green belt” (F. de Baroncelli)]
 [VITICULTEURS = WINEMAKERS]
 [SALINIERS -SALT MAKERS]

À la cote 0 mNGF
 Étang Vaccarès : 6 550 ha et 89,3 Mm³
 Étangs inférieurs : 950 ha et 3,4 Mm³
 Étang des Impériaux : 3 550 ha et 14,8 Mm³

Hydrosystème Vaccarès :
 Rôle de « réservoir régulateur » =
 élément clé du fonctionnement
 hydraulique de la Camargue (Heurteaux,
 1988)



[A la cote 0 mNGF] For a water level of 0 mNGF
 Étang Vaccarès 6 550 ha et 89,3 Mm³ Vaccarès lagoon 6 550 ha and 89.3 million m³
 Étangs inférieurs 950 ha et 3,4 Mm³ Lower lagoons 950 ha and 3.4 million m³
 Étang des Impériaux 3 550 ha et 14,8 Mm³ Impériaux lagoon 3 550 ha and 14.8 million m³
 [Hydrosystème Vaccarès: Rôle de « réservoir régulateur » = élément clé du fonctionnement hydraulique de la Camargue (Heurteaux, 1988)]
 Vaccarès hydrosystem: role as a “regulating reservoir” = key element in the hydraulic functioning of the Camargue (Heurteaux, 1988)]
 [Bassin de drainage poldérisé = Polderised drainage basin]
 [Bassin de drainage non poldérisé = Non-polderised drainage basin]
 [Système des étangs = Lagoon system]
 [Réseau de drainage = Drainage network]
 [Sens de l’écoulement = Direction of flow]
 [Exutoire des bassins non polderisés = Outlet for non-polderised basins]
 [Pompe de drainage = Drainage pump]

“Polderised” basin: a basin that is managed by pumping; there are pumps to irrigate and pumps to discharge water that has been used (agriculture, livestock, hunting, environmental management) and runoff from

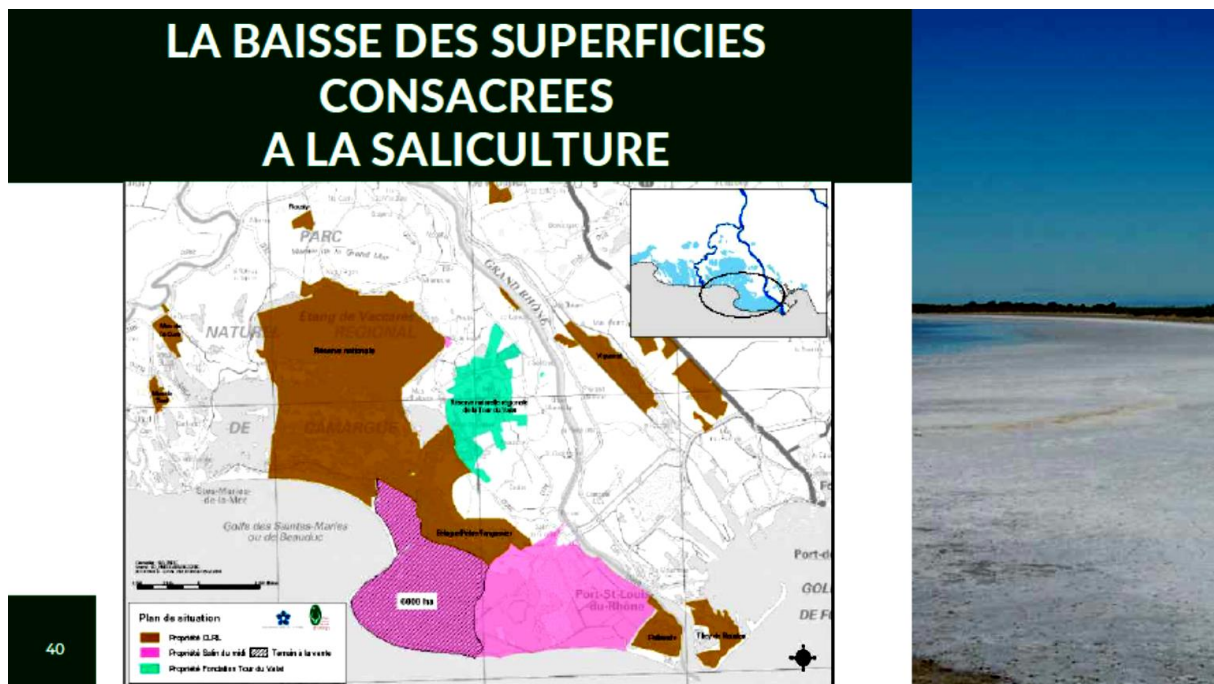
precipitation into the Rhone. “Non-polderised” basin: there is no pumping system to facilitate drainage and the drainage water is released by gravity into the Vaccarès system.

Flow reversal

The hydraulics of the Vaccarès were extensively influenced by human activity as far back as the 19th century, with the construction of the sea dyke and the dykes along the Rhône. Next, a complex irrigation network caused a profound shift in the hydraulic flows: in summer, the massive inflow of fresh water from agricultural drainage throws the annual hydraulic cycle into reverse at a time when the water level should be at its lowest. This results in a reduction in salinity fluctuations. At the same time, a decrease in exchanges with the river and the sea can be observed; the connections to the sea depend on two inlets closed by sluice gates or “pertuis”. Meanwhile, the slow but steady rise in the sea level prevents exchanges conducive to maintaining salinity at an acceptable level. This reversal of the hydraulic cycle is not without consequences for the sustainability of ecosystems and their capacity to support wintering birds in areas that are usually flooded in winter. There are also problems with lagoons becoming contaminated by pesticide-laden drainage water.

Salt making, agriculture and livestock production

The salt pans are an integral part of the landscape and heritage of the Camargue. Salt making is in decline, but it still goes on in the SE part of the delta.



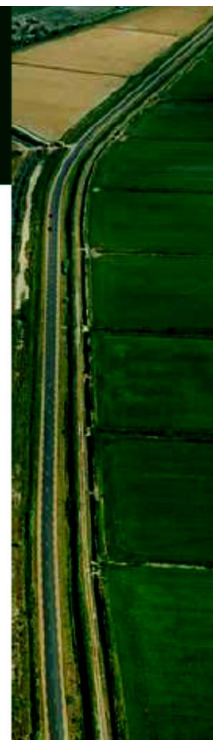
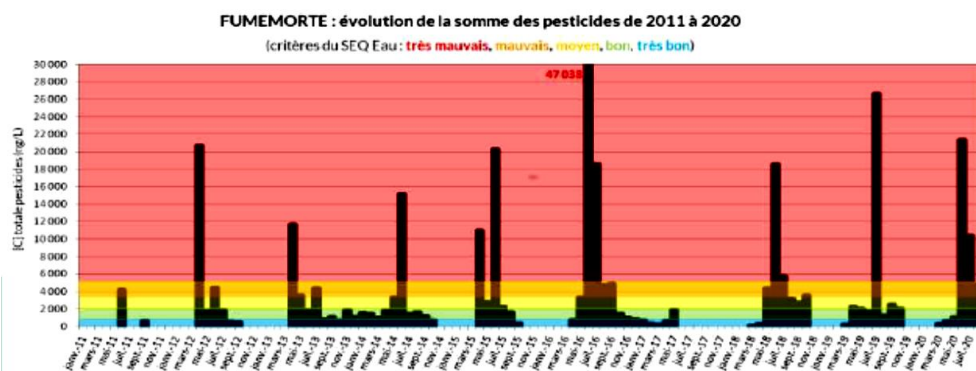
[LA BAISSÉ DES SUPERFICIES CONSACRÉES A LA SALICULTURE = DECREASE IN SURFACE AREA DEVOTED TO SALT MAKING]

There are still some traditional horse and bull farms in the delta, but they lie outside the national reserve. They help to maintain certain habitats and are part of the cultural heritage.

Agriculture has seen some major changes, with, alas, increased pollution and, at the same time, a fundamental shift in the dynamics of the hydraulic regime.

DES MUTATIONS AGRICOLES SUR LE BASSIN VERSANT

Baisse des surfaces en riz
Développement du maraichage
Effets d'aubaine (méthanisation)



[Des MUTATIONS AGRICOLES SUR LE BASSIN VERSANT =
AGRICULTURAL CHANGES ACROSS THE CATCHMENT AREA]

[Baisse des surfaces en riz Decrease in areas devoted to rice production
Développement du maraichage Growth of market gardening
Effets d'aubaine (méthanisation) Pernicious effects (methane release)]

[FUMEMORTE: évolution de la somme des pesticides de 2011 à 2020 =
FUMEMORTE: variations in the sum of pesticides from 2011 to 2020]

[critères du SEQ Eau: très mauvais, mauvais, moyen, bon, très bon =
SEQ Water¹ criteria: very poor, poor, moderate, good, very good]

As will be observed, the concentration of pollutants is closely related to the farming calendar (use of pesticides and fertilisers). The rise in the water level in the lagoons through direct gravity (water from agricultural land) is extremely problematic during the summer season.

The proposed solution is to pump water directly from the Rhone into the lagoons, while at the same time pumping agricultural drainage water into the Rhone downstream. While not optimal, the water quality of the Rhone is currently acceptable and is improving.

Implementing such a strategy involves pooling resources across the various stakeholders. That in turn would require co-ordination across the delta; in theory, this is the job of the Regional Nature Park and its water commission but unfortunately the institution is not functioning very well and seems incapable of fulfilling this role at present. The updating of the PNR charter should be seen as an opportunity to recast the park as a unifying and leading force in the hydraulic management of the delta. Consideration should also be given to the possibility of providing such co-ordination through the Biosphere Reserve, and so extending it to include the Gard section.

¹ SEQ Water: water quality evaluation system.

Rescue plan for the Vaccarès

Management efforts to tackle the consequences of global warming are currently focused on saving the Vaccarès. Based on extensive scientific data, an action plan has been prepared and submitted to the partners. There are, of course, major financial challenges, but these are not the only issues at stake.

OBJECTIVES

- increase in freshwater input directly from the Rhone
- judicious introduction of drainage water
- better connectivity to the sea thanks to restoration of the sluices (Fourcade, Comtesse)

Water level and quality

Un état de conservation en forte dégradation



[Un état de conservation en forte dégradation = A conservation status in severe decline]

- Lagoon increasingly confined as it becomes more marine in character
- Salt stock above 3 Mt for the past 5 years
- Increasing salinity
- Loss of seagrass
- Chronic chemical contamination of the system

Salinity, which varies seasonally, is not the only factor that needs to be considered. Attention must also, and above all, be paid to the salt stock that accumulates in the lagoon.

Plan de sauvegarde du Vaccarès



Volet apport d'eau douce

Issu des réseaux d'irrigation (ou drainage hivernal)

Respectant la saisonnalité (début printemps, fin été-automne)

Privilégiant les phases gravitaires

Utilisant les réseaux existants

Ne déséquilibrant pas le fonctionnement des ASA
(capacité des pompes et des réseaux, équilibre EN/agricole)

Obtenir des niveaux favorables aux basculements au milieu de l'automne
(vidange, stock de sel): 8 à 35 M m3



ASA: authorised water user associations which manage the Camargue's hydraulic networks

[Plan de sauvegarde du Vaccarès = Vaccarès rescue plan]

[Volet apport d'eau douce = Freshwater input]

[Issu des réseaux d'irrigation (ou drainage hivernal) = From irrigation or winter drainage networks]

[Respectant la saisonnalité (début printemps, fin été-automne) =

In tune with the seasons (early spring, late summer-autumn)]

[Privilégiant les phases gravitaires = With priority being given to gravity-driven flows]

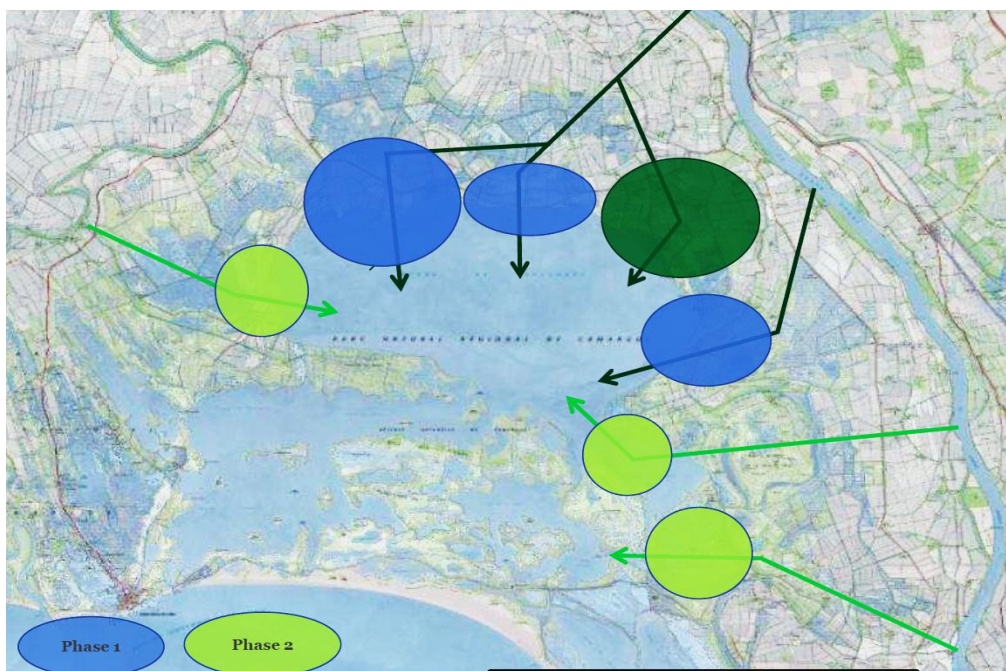
[Utilisant les réseaux existants = Using existing networks]

[Ne déséquilibrant pas le fonctionnement des ASA (capacité des pompes et des réseaux, équilibre EN/agricole) = With care being taken not to disrupt the operation of the ASAs (pump and network capacity, balance between natural areas/agricultural land)]

[Obtenir des niveaux favorables aux basculements au milieu de l'automne (vidange, stock de sel) : 8 à 35Mm3

Achieve levels conducive to mid-autumn transfers of water (draining, salt stock: 8 to 35 million m3)]

The rescue plan is currently still at the design and fundraising stage. It is proposed to implement it in two stages as shown on the map below:



Tackling the consequences of climate change

The National Reserve and indeed the whole of the Camargue are directly impacted by the consequences of climate change. The differences in elevation between the various elements (sea, lagoons, agricultural zone) being minimal, the system is extremely vulnerable to any variations in level.

The gradual rise in sea level observed in recent years is set to continue, or even accelerate, however, according to the various scenarios modelled by the Intergovernmental Panel on Climate Change (IPCC). It is imperative that the measures proposed by the National Reserve be adopted without delay by all the partners.

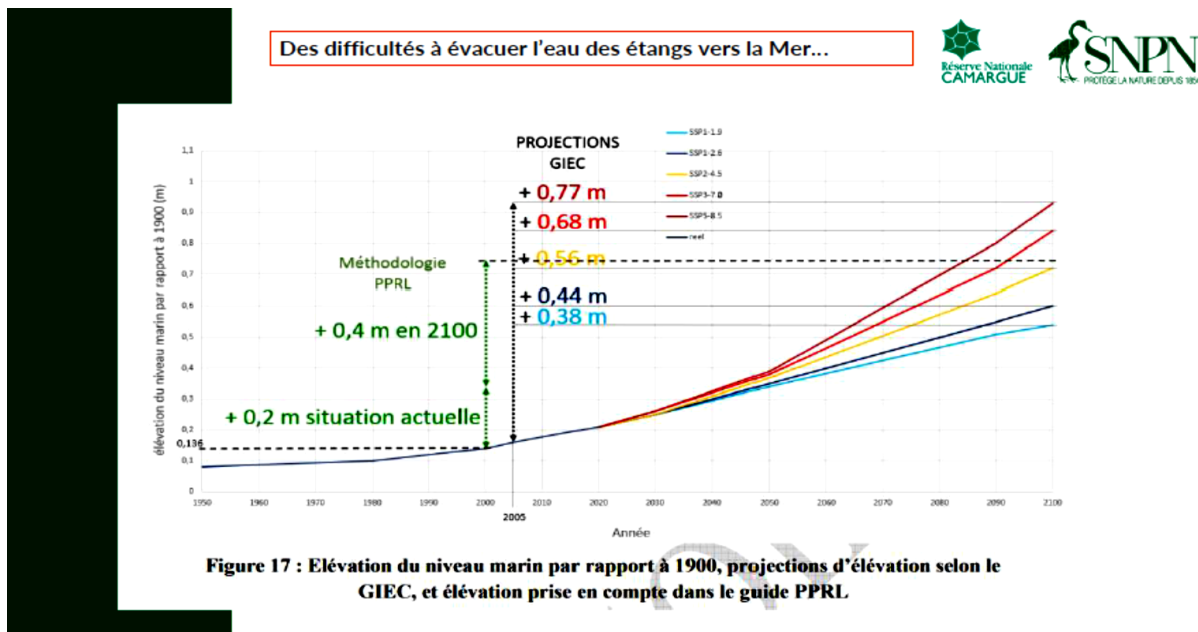


Fig. 17: Rise in sea level relative to 1900, projected rise according to GIEC, and rise assumed in the PPRI guide]

[Des difficultés à évacuer l'eau des étangs vers la Mer = Difficulties in evacuating water from the lagoons into the sea]

[PROJECTIONS GIEC = GIEC PROJECTIONS]

[Méthodologie PPRL = PPRL methodology]

[situation actuelle = current situation]

[Figure 17 : Elévation du niveau marin par rapport à 1900, projection d'élévation selon le GIEC, et élévation prise en compte dans le guide PPRI =

The spread of invasive species, whether or not linked to climate change, remains a concern for the managers. Various techniques are employed, depending on the species and the terrain.

Follow-up on the conditions and recommendations attached to renewal of the diploma in 2011

A) Condition

Guarantee the implementation of the management plan for 2011-2016

The plan was implemented, as was the following one (2016 - 2020). A new 5-year plan is being drawn up. It is expected to take effect in early 2023.

B) Recommendations

1. *Study the possibility of reviving co-operation with other deltaic sites that have been awarded the European Diploma (such as the Doñana National Park in Spain or the Danube Delta Biosphere Reserve in Romania);*

The reserve has plainly had other priorities: it must also be borne in mind that each of the reserves mentioned is evolving in very different local and regional contexts, limiting the usefulness of such exchanges. The reserve can also go through the Ramsar network for this kind of interaction.

2. *Grant sufficient additional resources, both financial and human, in particular with a view to the future setting up of a perimeter of protection as laid down in the law of 10 July 1976 on nature conservation, so as to guarantee management, surveillance and scientific monitoring of the reserve;*

Changes to the perimeter are no longer on the agenda; the current policy is to leave the status of the reserve as it is and to continue purchasing sites through the Conservatoire du Littoral. Any alteration to the current reserve might have the unintended effect of weakening its protection status.

3. *Ensure the strict application of limits to the discharge of agricultural water into the reserve, particularly into the Vaccarès lagoon, and pursue co-operation with rice growers in accordance with sustainable development principles, as well as to ensure the implementation of the five-year action programme as agreed by the different stakeholders;*

There have been delays on this front, mainly due to operational failures on the part of the Regional Nature Park and changes in the reserve's management. The issue remains highly relevant and has been fully taken on board in the new management plan, with quantified objectives and a timeline for implementation.

4. *Ensure the strict application of limits to the discharge of agricultural water into the reserve, particularly into the Vaccarès lagoon, and pursue co-operation with rice growers in accordance with sustainable development principles, as well as to ensure the implementation of the five-year action programme as agreed by the different stakeholders;*

Discharges have been monitored and offenders reported. The subject is a sensitive one and co-ordination with the farming community remains to be improved. The Vaccarès rescue plan includes proposals for action along these lines.

5. *Give a higher profile to the European Diploma and the work of the Council of Europe, particularly in information provided at public reception points and in leaflets on the Camargue National Reserve;*

The multiplicity of perimeters and types of protection status makes it difficult to highlight all the various national and international labels that have been awarded. There is still room for improvement, particularly as regards updating displays at information points.

6. *Control the number of visitors at the periphery of the reserve;*

The Reserve does a good job of controlling the flow of visitors. Because, however, there is no access by public transport, vehicle traffic tends to be heavier. The area most affected is the sea dyke, which attracts very large numbers of visitors. Overall, the situation is largely under control. A watchful eye needs to be kept on the plans for a new bridge over the Rhone, however, as this would almost certainly mean a huge increase in traffic.

7. *Prepare a plan for adaptation to climate change, including the rise in sea level.*

The reserve's authorities, and in particular its Scientific Council, are very sensitive to this issue. The measures proposed in the management plan, and more specifically in the Vaccarès rescue plan, are a move in this direction.

Conclusion and recommendations

The RNNC has received a boost in recent years, with a change of management and a new management plan. It enjoys strong support from its governing body (SNPN) and partner, the Conservatoire du Littoral, ensuring effective implementation. The reserve controls its territory very well and the assets that made it valuable are still very much there, although changes and/or decreases in certain bird populations have been observed. Climate change is a concern, but the manager has taken action to mitigate the impact of these changes.

The fact, however, that the Reserve is heavily dependent on the regional context in terms of water supply, water pollution and also visitor flows is a concern for the long term. It would be good if the whole of Camargue were to see some fresh momentum where conservation is concerned, with the PNR and/or the Biosphere Reserve being used as an interface for dialogue.

We accordingly propose that the European Diploma of Protected Areas be renewed in the case of the Camargue National Nature Reserve for a period of 10 years, with the following recommendations:

1. Adopt and implement the 2022-2027 Management Plan and then develop and implement a new 10-year plan;
2. Adopt the Vaccarès Rescue Plan with the local stakeholders concerned and swiftly introduce the first measures with rigorous scientific monitoring;
3. Press ahead with the renovation work on the “pertuis” (sluices with gates between the sea and the lagoons), and in particular create fishways that function even when the gates are closed;
4. Improve co-operation and co-ordination with the managers of other protection instruments in the Camargue, in particular the Regional Nature Park and the Biosphere Reserve, so as to ensure comprehensive and consistent management;
5. Explore the possibility of creating, with the state partners (agriculture and environment ministries), an agricultural co-ordinator’s post, to be filled by someone with a background in agriculture;
6. Continue the policy of land purchases through the Conservatoire du Littoral and entrust the management of the land to the RNNC;
7. Continue rigorous scientific monitoring, in particular of water quality and water levels, in order to anticipate the consequences of global warming;
8. Continue to control invasive alien species, combining appropriate techniques;
9. Control the flow of visitors, especially in the seaside area; maintain the level of infrastructure and interpretive signage for visitors and update as necessary; give greater prominence to the European Diploma at information points;
10. Keep a very close eye on the following:
 - a. plans to build off-shore wind farms in the path of migratory routes and their potential impact on birdlife;
 - b. plans to construct a bridge over the Rhône downstream from Arles, to replace the current ferry service.

Appendices

List of participants (meetings and visits)

SURNAME, FIRST NAME	ORGANISATION	JOB TITLE
AZIBI LUC	DREAL PACA	Chargé de mission - Service Biodiversité, Eau et Paysages
ELLUL FABIENNE	Sous-Préfecture d'Arles	Sous-Préfète
LUGLIA REMI	Society for the Protection of Nature (SNPN)	President of the Association
MAILHAN JACQUES		Farmer and breeder of Camargue bulls, Chamber of Agriculture's representative on the RNNC management board
PEGUIN MARION	Conservatoire du Littoral (CDL)	Chargée de mission Gestion - Aménagement - Délégation de rivages PACA
PROFESSOR RAMADE FRANCOIS	Society for the Protection of Nature (SNPN)	Chair of the RNNC's Scientific Council
VADON LAURE		Representative of the Vaccarès residents association, Horse breeder
HENAULT ISABELLE	Commune of Saintes Marie de la mer	Manager of holiday gîtes located on the edge of the Reserve Expert appointed by the municipal authorities to deal with water management
TEAM FROM THE CAMARGUE NATIONAL NATURE RESERVE		
HEMERY GAELE	Camargue National Nature Reserve	Director of the Reserve
BELENGUIER LUC		Curator

Documents consulted

Camargue National Nature Reserve : <https://www.snpn.com/reservedecamargue/>

Société nationale de protection de la nature : <https://www.snpn.com/>

Management plan 2016-2020 :

https://www.paca.developpement-durable.gouv.fr/IMG/pdf/1_pg_2016-2020_a_diagnostic-2.pdf

Tour du Valat management plan:

https://tourduvalat.org/wp-content/uploads/2019/01/PdgRNRTDV_20162020_vol1.pdf

QUALITATIVE ASSESSMENT OF THE 2016-2020 MANAGEMENT PLAN FOR THE CAMARGUE NATIONAL NATURE RESERVE – Final report. Doc RNNC

Management plans of the Conservatoire du littoral, Vaccarès site, Camargue National Nature Reserve
<file:///D:/Telechargements/Plan-de-gestion-Vaccarès.pdf>