

Adaptation to climate change of the Petite Camargue Alsacienne National Nature Reserve **VULNERABILITY ASSESSMENT AND ADAPTATION PLAN**

BACKGROUND

The [Petite Camargue Alsacienne National Nature Reserve](#), located at the Southern end of the Alsace plain, was created in 1982 to preserve the relics of the Rhine alluvial natural habitats. It is a 904-hectares alternation of aquatic natural habitats, wet or dry open natural habitats and forest natural habitats which host many species of flora and fauna, including several of heritage interest.

The vulnerability assessment and the adaptation plan are documents aiming to initiate an approach to adaptation to climate change on the reserve. Both were developed as part of the [LIFE Natur'Adapt project](#), coordinated by [Reserves Naturelles de France](#).

METHOD

Along with the **evolution of climatic trends**, the **probable evolutions of non-climatic pressures** have also been considered: every socio-economic activity with direct or indirect influence on the reserve, and also other natural pressures such as invasive alien species.

In order to analyse the impacts of climate change on the reserve using the vulnerability and opportunities assessments, **we selected 33 objects**: 9 natural habitats, 6 heritage species, 6 regulated species, 11 management tools and resources and 1 socio-economic activity. Information for the analysis was based, for natural heritage, mainly from scientific literature and experts' statements, and for management tools and resources, mainly from the salaried team' statements. The results of the assessment were then submitted to the scientific council of the reserve for validation.

In addition, researches have been carried out on new species which are arriving or which may arrive in the future.

The limits of the assessment are mainly based on a lack of knowledge on the impacts of climate change but are also related to ecological preferences. As the intensity of the vulnerabilities or opportunities may vary depending on the knowledge available and the feelings of the person assigning the rating, we must focus on the expected impacts rather than on the note in itself which remains subjective.

The impacts identified during the assessment were used as a working basis to write the prospective story of the reserve and the adaptation plan. The adaptation plan was presented to the scientific council and the reserve management advisory committee for validation. The whole adaptation plan will be integrated into the new management plan currently being drafted.

These different elements can also be reused in communication documents for the general public and local stakeholders.

SUMMARY OF THE VULNERABILITY ASSESSMENT

Climate trends for the future, in addition to the overall increase in temperature, show two opposite trends over the year: **winters will be wetter** with an increase in overall precipitation, while **during the summer periods, overall precipitation will decrease**. Droughts will go increasingly regular and severe.

The frequency of extreme events such as heatwaves, strong winds and torrential rains will carry on increasing.

The change in snow conditions in the Alps will also have repercussions on the Rhine: **winter flows will be on the**

rise, linked to precipitation in the form of rain instead of snow, and **summer flows will decrease** with low-water levels longer and fiercer.

In view of the major climatic trends described, the wet nature of the reserve could be partially threatened.

The aquatic, phreatic, and pluvial natural habitats risk a complete drying up during the summer period and the associated wetlands could evolve into drier habitats, and lose their typical plant species. Permanent aquatic areas could lose quality through the eutrophication of the water. Animal species dependent on these habitats will suffer greater mortality due to droughts and sensitive species may disappear.

On the other hand, new opportunities will be created for dry meadows, rich in heritage species.

The expected changes in the natural habitats will also lead to readjusting management tools and resources.

For example, it will probably be necessary to review the maintenance of open areas by grazing to respond to changes in vegetation, by adjusting the size of herds and pens and the duration of grazing.

SUMMARY OF THE ADAPTATION PLAN

The main adaptation strategy of the Petite Camargue Alsacienne National Nature Reserve consists, as a first step, in trying to maintain the current natural habitats in a functional state, thus guaranteeing refuge areas for animal species. If this turns out not to be possible, the natural habitats will be supported in their transition.

Most of adaptation measures are readjustments of management measures that are or have already been carried out on the site. Due to its historical context of creation, the reserve has a very interventionist management which allows a relatively wide margin of action.

Though, some more innovative measures have been incorporated into the adaptation plan, inspired from other existing adaptation plans. These measures are, for the moment only at a reflection stage. They should be

developed in the future according to the natural habitat evolution trends.

As an example of a specific adaptation, the Camargue Alsacienne National Nature Reserve carries on with the geomorphological restoration of the Old Rhine by digging out rocks from the banks and injecting sedimentary material. This will lead to foster phreatic exfiltration, and create refuge areas for freshwater species. It will also temper the rise in water temperature. More generally, the managers will try to maintain some parts of the aquatic habitats and wetlands via the reserve's water supply circuit. Non-watered habitats will be supported in their transition by fighting as far as possible against invasive alien species and/or woody plants spread.

Resources and management tools will be readjusted according to the response of the ecosystems over time, particularly in terms of frequency and type of action.

In the meantime, proposals were made to improve management measures: acquisition of new equipment, test of new techniques and improvement of what is already in place, as for example carrying on the gradual restoration of the water supply circuit.

Part of the adaptation plan also concerns the reduction of non-climatic pressures, in particular those from socio-economic activities within or near the reserve. This means strengthening awareness actions towards general and specific publics as well as increase of police actions. At the same time, cooperation is being put in place with local actors such as the neighbouring agglomeration: for example, improve the green and blue belt network (French "Trame Verte et Bleue"), or offer consultancy services when projects aimed at improving biodiversity in the territory.

CONSULTATION OF ENTIRE DOCUMENTS

[Vulnerability assessment \(fr\)](#)

[Adaptation plan \(fr\)](#)

