

Adapting to climate change in Valley of the Lakes sensitive natural areas

VULNERABILITY ASSESSMENT AND ADAPTATION PLAN SUMMARY

CONTEXT

Located in the Vosges department, the valley of the lakes is made up of three lakes of glacial origin: the lake of Gérardmer, the lake of Longemer and the lake of Retournemer. The largest network of interconnected natural lakes in the Vosges massif. Oligotrophic, they still have the fauna and flora of mountain lakes. Gérardmer lake has aquatic Isoetes meadows, unique in the Grand Est, which are still well developed despite the numerous tourist activities. Lake Longemer is wilder, but tourist activity is limiting the development of the grass beds. The river Vologne links the Longemer lake to the Retournemer lake. The latter, smaller and enclosed in a glacial cirque, is the most preserved. It is colonised by a floating peat bog which is home to the characteristic species of the massif's peat bogs.

The three lakes are [listed in the inventory of Sensitive Natural Areas of the Vosges](#) Departmental Council, but they do not all have the same protection status. Thus, the Vosges Lakes Valley joined the Natur'Adapt approach in its test phase in order to evaluate the tool with this 'ENS' label. The Gérardmer lake is only listed as an ENS without any management approach or management plan. Nevertheless, support for local elected officials is provided via the Great Lakes Project. Concerning the Longemer lake, it is preserved, in part, by the control of use and has a management plan in progress (2012/2023) but which takes little account of climate change. When it is renewed, [Natur'Adapt](#) methodological work should be carried out. Lake Retournemer has been preserved through a management agreement with private owners since 2020. Its management plan (2020/2030) considers climate change without the Natur'Adapt methodology.

VULNERABILITY ASSESSMENT

The valley will rapidly undergo direct and indirect transformations related to climate change under all future trajectories. Under the scenario without greenhouse gas emission reduction policies (RCP 8.5), temperatures will warm throughout the year with an increase in annual temperatures of 2°C in the medium term. This will lead to an increase in heat waves and hot days. Conversely, the number of frost days and cold spells will decrease drastically. As temperatures rise, snowfall will turn into rain, with an increase in rainfall outside the summer period. All of these phenomena will lead to **higher low water levels** in the spring and summer, thus **creating pressure on water resources and quality**. Thus, all these changes will influence the functioning of ecosystems and human activities with different degrees of resilience and therefore a more or less important vulnerability in the long term.

The functioning of the Vosges lakes, and its associated catchment area, will be impacted in the short term. Thus, the objects **quality, water quantity and lake banks** are linked to each other. Climate change will modify the **distribution and intensity of the rainfall** impacting these objects. The 1st category fish species, the Isoëtides and, more generally, **the aquatic meadows will, in the long term, be marked by their banalisation** because they have few adaptation systems. As far as leisure activities are concerned, **four-season tourism will become more important**, with a change in the number of visitors. In the short term, climate change will be favourable to the development of four-season activities. However, in the long term, tides, cyanobacteria, etc. could lead to periods when **bathing is not permitted, while the demand for freshwater islands will increase**.



©ENS de la Vallée des lacs – Lac de Retournemer

ADAPTATION PLAN

The total surface area of aquatic meadows will increase, but this will lead to **a loss of the specificity of mountain meadows** and, with the search for freshwater islands, to **a duality with leisure activities**. The possible solution for adaptation is **strong protection** in conjunction with awareness-raising among the various stakeholders. More specifically, the Isoetids will decline. Adaptation actions such as specific mowing of colonising species or reinforcement should be considered. The temperature monitoring process will continue **to assess whether the temperatures are still compatible with the reproduction of cold-water species**. Water quality will be impacted by the transfer of materials from the catchment areas. The proposed solutions are **to limit them, restore the banks and carry out a study of seasoning** around the lakes.

The quantity of water will be strongly disrupted whereas it is necessary for the preservation of the associated wetlands. **A quantitative water resource management plan** linked to awareness-raising among local stakeholders are adaptation solutions. The fish population will be modified, especially for cold water species such as trout. **Work to restore ecological continuity and raise awareness among fishermen is essential**. Finally, the banks of the lake will suffer more erosion due to changes in tourist practices. The creation of **a plan to welcome bathers and restorations are envisaged** to adapt to these changes.

In this Adaptation Plan, two major issues emerge at the scale of the lake valley: the functioning of the lakes in the catchment area, towards **a dysfunction of the mountain lake ecosystem** and the change in biological communities towards a **homogenisation/banalisation of the environment**.

To continue the Natur'Adapt approach, several perspectives are imagined and at several scales. The ENS inventory tool alone cannot provide an understanding of the Natur'Adapt approach because **there are too many disparities in policy depending on the department**. A simplification of the approach is necessary. At the level of the Vosges Department, **climate change will be considered in all the ENS sheets** and in the methodology for evaluating the sites. At the Lorraine level, work is to be done with the CEN L Scientific Mission to ensure that the **management plans** (new or renewed) **include a climatic account for each [natural area](#)**.

ENTIRE DOCUMENTS AVAILABLE
HERE:

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

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

