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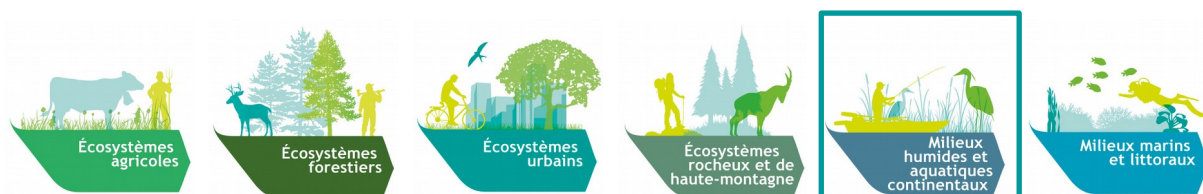
Commissariat général au développement durable



Continental wetlands and freshwater ecosystems in France

Key messages for decision makers

APRIL 2019



Continental wetlands and freshwater ecosystems cover a very diversified set of natural or artificial environments.. They are characterized by the presence of permanent or temporary water: streams, ponds, marshes, canals, reservoirs, etc. Water can be stagnant or not, salty or not, or brackish. At present, no national inventory can be used to accurately and completely assess the area of continental wetlands and freshwater ecosystems throughout metropolitan France and overseas. The most recent cartographic works estimate that potentially humid environments cover about 23% of the metropolitan area, or nearly 13 million hectares.

This evaluation was conducted by the *Commissariat général au développement durable* with the support of a working group and experts from *Institut national de recherche en sciences et technologies pour l'environnement et l'agriculture* (Irstea). It has been reviewed by the EFESE Scientific and technical advisory board and the key messages for decision-makers that emerged from were discussed and approved on 7 November 2017 by the EFESE National stakeholders committee. The level of consensus observed and cross-references to the detailed sections of the report are presented in the margins of the messages.

To access the full report (in French): <https://www.ecologique-solidaire.gouv.fr/EFESE>

1. It is estimated that about half of the French wetlands has disappeared between 1960 and 1990¹. This is partly due to urbanization and the numerous land drainages, with the aim of improving the regularity of cereal production, or still to transform grasslands into arable crops². Recognition of the different values associated with these environments has allowed this decline to slow down since 1990³.

^{1,3} Well-established and accepted (§4)

³ Well-established and accepted (§5)

Ecological condition, its evolutions and drivers

2. Continental wetlands and freshwater ecosystems are biodiverse thanks to their many essential habitats for a large number of species. In metropolitan France, they are home to more than a third of the listed species in the territory¹. In the overseas territories, they support biodiversity, which sometimes includes endemic species².

^{1,2} Well-established and accepted (§4)



Above : Gray Heron (*Ardea cinerea*) on the lookout in the aquatic vegetation, on a pond of the Dombes (Auvergne-Rhône-Alpes) © Thierry Degen – Terra

Below : Frog (Occitanie) © Arnaud Bouissou – Terra.

3. Continental wetland and freshwater ecosystems are among the least well conserved ecosystems at the national level, placing them at the heart of conservation issues¹. These habitats are home to nearly 45% of endangered species in metropolitan France². Despite of this situation, the populations of waterbirds in mainland France are, in general, in a good state of conservation³.

^{1,2,3} Well-established and accepted (§4)

4. Overall, less than half of the French water bodies were judged to be in good or very good ecological state in 2013 according to the Water Framework Directive¹. This assessment covers contrasting situations depending on the considered parameters². While nitrate levels in these environments have remained stable and remain at levels likely to disrupt the functioning of these environments since the mid-2000s³, the pollution of rivers by organic matter and phosphorus, sources of biological unbalance, has decreased significantly over the same period⁴.

^{1,2} Well-established and accepted (§4)
^{3,4} Well-established and accepted (§4 and §5)

5. Continental wetlands and freshwater ecosystems are the receptacles of anthropogenic pollution such as nitrogen, phosphorus, heavy metals and organic micropollutants (PCBs, pesticides, etc.), generated within the agricultural and urban ecosystems, that they partly transfer to the marine environment. Recent studies show that about 80% of marine pollution are of land-based and anthropogenic origin¹. **In addition to water pollution, habitat fragmentation and destruction appear to be the drivers of change with the greatest impact on continental wetlands and freshwater ecosystems².** Thus, at the national scale, the 80 000 obstacles on the rivers have a significant impact on ecological continuity³. Finally, the development of invasive alien species (nutria, ambrosia, jussie, tiger mosquito, etc.) whose frequency of introduction is increasing, affects biodiversity and impacts health and the economy⁴.

¹ Well-established and accepted (§ 3)
^{2,3,4} Well-established and accepted (§ 5)



The Louisiana crayfish, an invasive alien species (Occitanie)

© Arnaud Bouissou – Terra.

6. The development of some water-intensive crops (eg irrigated maize) may be a source of water stress in some French regions during drought events and affects the functioning of continental wetlands and freshwater ecosystems¹. These water

^{1,2,3} Well-established and accepted (§ 5)

stress situations will increase in the coming years as a result of climate change². Recent modeling exercises estimate that the reduction of summer precipitation combined with a temperature increase will favor periods of drought³.

Ecosystem goods and services, natural heritage

7. Goods taken from continental wetlands and freshwater ecosystems, mainly fishes, have a commercial value of around €240 million per year¹. Caught fishes by professional fishermen is at the origin of an economic activity that generates a more than 10 million euros turnover². Added to this is the value of the goods taken in a recreational and non-commercial context, which can be estimated at nearly €105 million³. On the other hand, continental fish farming gives rise to the production of goods worth more than €125 million⁴. Added to these figures are goods that may have a strong heritage value despite of a lower commercial value (some waterfowl game, wicker, etc.)⁵.

^{1,2,3,4,5} Well-established and accepted (§ 6)

8. Continental wetlands and freshwater ecosystems regulate the quality of surface waters thanks to their ability to retain nitrogen, phosphorus, suspended solids and organic micropollutants¹. These functions are of economic interest as they contribute to reduce the costs of water treating and purifying units². They also improve the quality of water in natural environments, with positive consequences in terms of health and sustainability of certain commercial activities (fish farming, shellfish farming, professional fishing, including maritime) and recreational activities³. On the sole role of nitrogen retention by rivers, the value of the service exceeds €2 billion annually at the national level⁴.

^{1,2,3,4} Well-established and accepted (§ 7)

9. Some continental wetlands and freshwater ecosystems store water and slow down water flows, thus mitigating flooding¹. By limiting potential impacts on downstream human settlements, the mitigation of floods by wetlands generates significant economic benefits at the national level².

^{1,2} Well-established and accepted (§ 8)

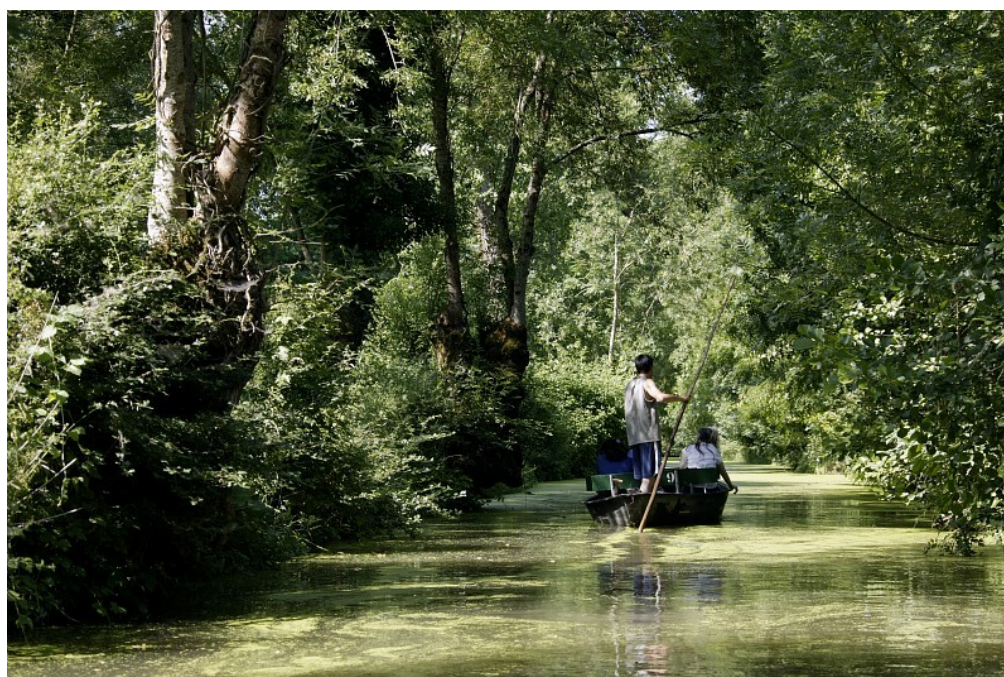


Barge in the Parc de la Deûle (Hauts de France)

© Laurent Mignaux – Terra.

10. Thanks to the largest network in Europe (8,500 km of navigable waterways), metropolitan France has developed over the last thirty years an important supply of river tourism (boat trips, river liners, hotel barges, rental boats), with more than 10 million users and a turnover exceeding €500 million each year¹.

¹ Well-established and accepted (§ 8)



Boat trip in the Marais Poitevin (Nouvelle Aquitaine)

© Thierry Degen - Terra

11. Continental wetlands and freshwater ecosystems host several other types of activities: pedagogical, naturalistic observations, healing, hunting and recreational fishing¹. Only hunting expenditures for waterfowl game and fishing have been evaluated². Hunters incur annual expenditures of around €380 million³. With 1.4 million members, recreational fishing in freshwater is a valuable activity. Annual freshwater fishers expenditures are between €0.8 and €1.2 billion⁴.

^{1,2,3,4} Well-established and accepted (§ 8)

12. Beyond the utilitarian dimension for the human societies of nature, transcribed by the valuation of ecosystem goods and services, continental wetlands and freshwater ecosystems have a heritage value¹. This is expressed in particular through different status of regulatory protection (Natura 2000 Network, National Plans for endangered species, etc.) and labels (Ramsar Sites, UNESCO World Heritage, etc.)². Under the Ramsar Convention, France has 46 wetland sites of international importance in 2017³.

^{1,2,3} Well-established and accepted (§ 9)

Knowledge and data gaps and needs for further studies

13. Monitoring activities and existing knowledge remain incomplete to provide a comprehensive quantitative picture of the ecosystem goods and services produced by continental wetlands and freshwater ecosystems¹. The evaluation of many valuable regulating services (regulation of water quality and regulation of flood flows mainly) and their national mapping require a research and modeling effort, that is essential if they are to be considered in decision making processes². Evaluation of several cultural services requires data collection and the establishment of benchmarks³. Conducting a national study of all wetland-specific cultural services may be relevant for providing rapid early estimates of wetland values⁴.

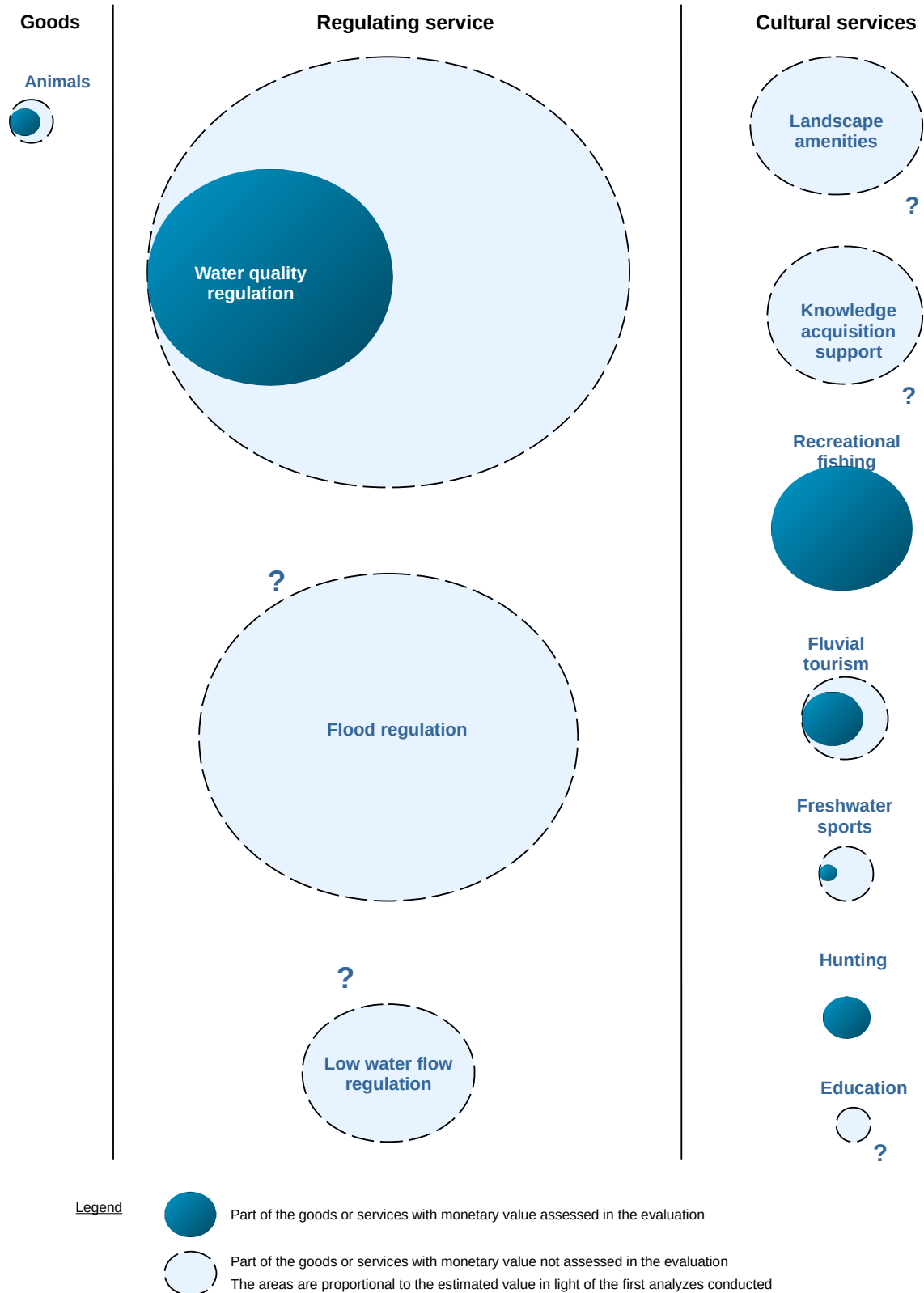
^{1,2} Well-established and accepted (§ 6 à 11)

^{3,4} Well-established and accepted (§ 13)



Monitoring of the European pond turtle (Occitanie).

© Laurent Mignaux – Terra.



Values of the goods and services associated with French wetlands and freshwater ecosystems



The EFESÉ is a program and a science-policy-society platform led by the Ministry for an Ecological and solidarity transition. It aims at revealing the multiple values of biodiversity in order to facilitate their integration in public policies and private decisions in

France. The program builds on a shared conceptual framework and a national governance that brings together experts, policy makers and stakeholders. After a first phase ending with the publication of six broad assessments covering French ecosystems, EFESÉ is starting a second phase whose operational and strategic character will be reinforced in order to develop the tools required to foster the ecological transition of the French society.

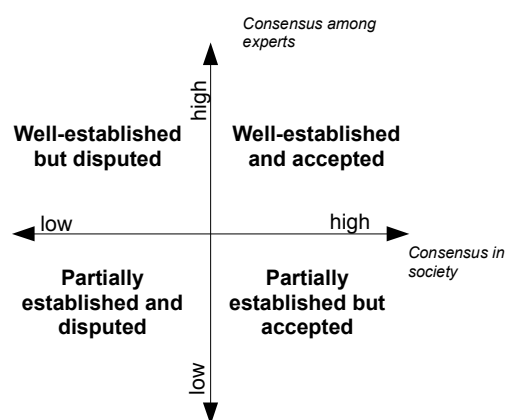
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The key messages for decision makers

The key messages for decision-makers are co-written by the EFESÉ project team of the Ministry for an Ecological and solidarity transition and by the authors of the studies. In order to enhance their scientific credibility and their legitimacy in the eyes of decision-makers, they are subject to scientific advice and stakeholder approval.

Every assertion composing these messages is qualified on two dimensions. The **scientific consensus**, first, is informed on two levels. It is proposed by the authors of the study and submitted to an arbitration by the EFESÉ Scientific and technical advisory board. The **societal consensus**, on the other hand, is informed on two levels. Unless opposition is expressed, the level of consensus is considered high. It is degraded as soon as a stakeholder disputes the assertion and makes the reasons for its disagreement explicit. This gives rise to the four qualifications which are presented opposite and indicated in the margin of the messages.



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