**SUMMARY**

Despite their recognized economic, social, cultural and environmental value, European lakes and wetlands are under severe pressures that threaten its conservation. Given that water withdrawals are among their most common pressures, the fact of ensure an adequate flood regime is considered a key factor in maintaining its rich biodiversity and associated ecosystem services. The objective of this thesis is to develop a methodology to meet the water needs of these ecosystems, based on sound scientist foundations and in compliance with legal requirements.

This thesis first performs a synthesis of the legal framework for the protection of wetlands, both Spanish and EU level. The legal analysis was oriented to answer relevant questions around the concept of wetland, legal terminology, protection levels, etc. This analysis has been complemented with a review and synthesis of scientific and technical fundamentals that explain the role of the flood regime in the composition and distribution of species and the interactions between them, the natural processes involved and the abiotic environment. There has also been a review of the calculation methods of the water needs of lakes and wetlands, both in Spain and internationally. These three aspects (legal, scientific and technical) have served as a basis for designing the methodology for calculating the water needs of lakes and wetlands made in this thesis.

The theoretical development of this calculation method is complemented with the application in five emblematic Spanish wetlands. These case studies allow assess the applicability of the methodology in very different types of wetlands, including a high mountain lake, endorheic inland wetlands and wetlands linked to river systems. Based on the available information, you carried out biological tests to validate the proposed water needs based on the flood regime with their environmental objectives, primarily for the good ecological status and favorable conservation status of selected habitats and species.

Finally, the results from the methodology proposed in the thesis are discussed in the context of the scientific principles of ecosystem management and other methodologies used for that purpose. The case studies have allowed analyzing their applicability and the particularities of each one. You have also evaluated the benefits that could be obtained by applying the methodology at the national, European and international level, including its overall contribution to a more sustainable use of water.

**Keywords:** flooding regime, environmental targets, calculation methods, water needs, wetland conservation.