HABITAT CONDITION

Lenitic ecosystems (Inland Standing waters)
Spanish Metodological Approach

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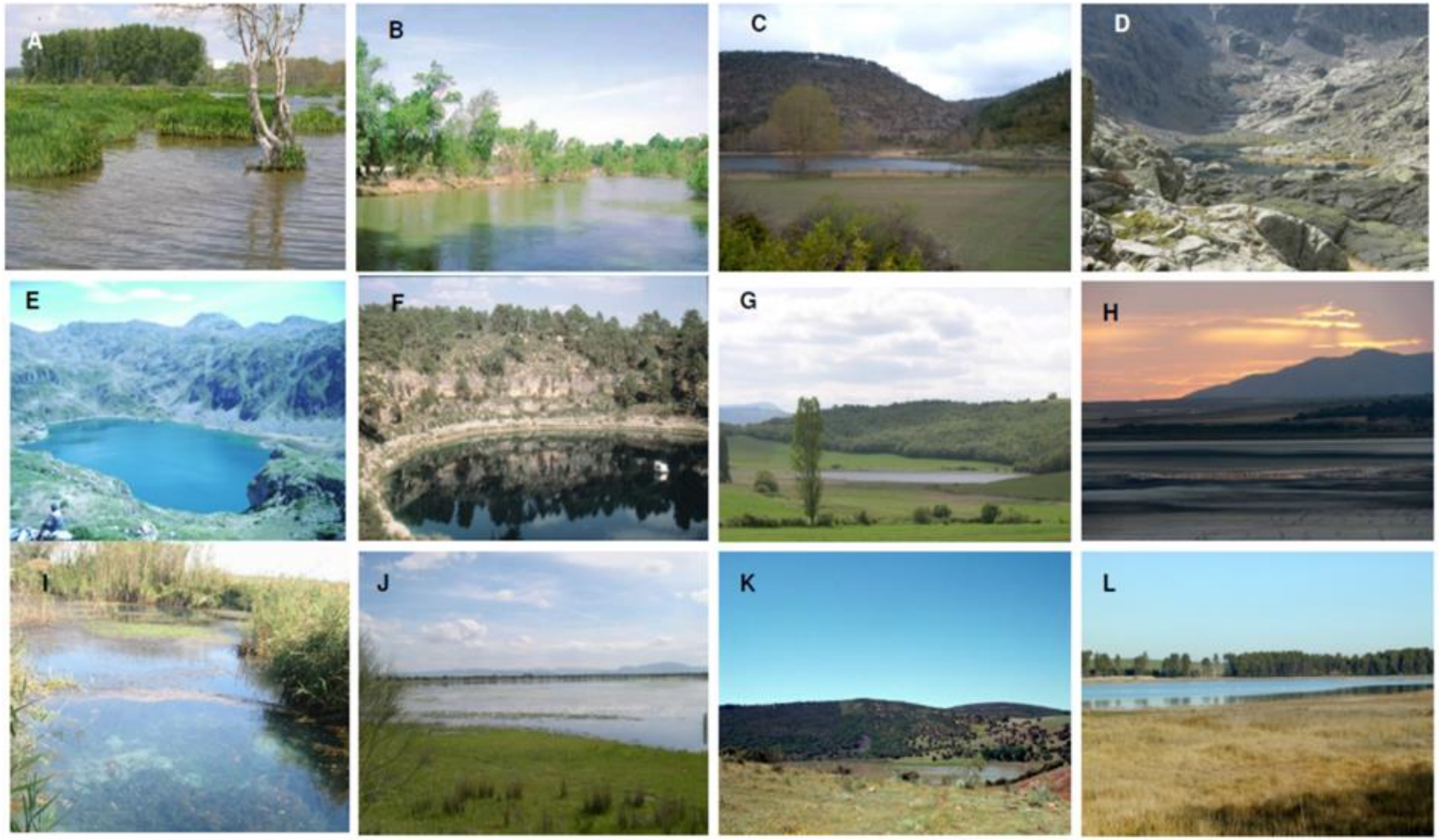
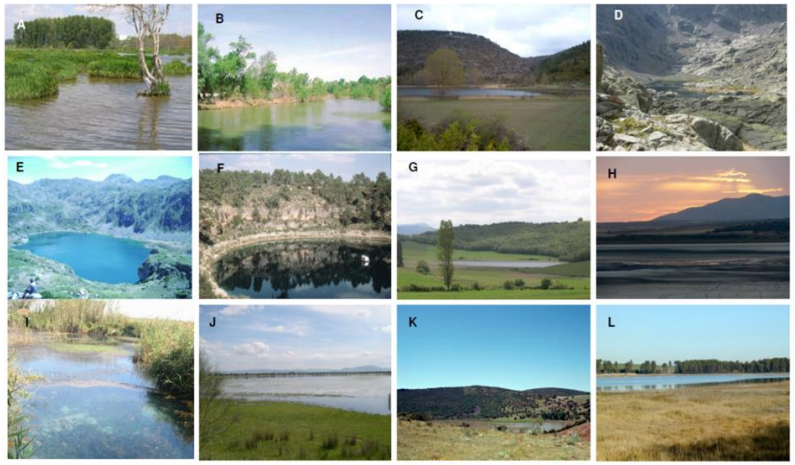
Lenitic ecosystems (lakes and ponds) corresponding to the various types in the ecological classification



Source: Extracted from Camacho et al. (2009)

Introduction



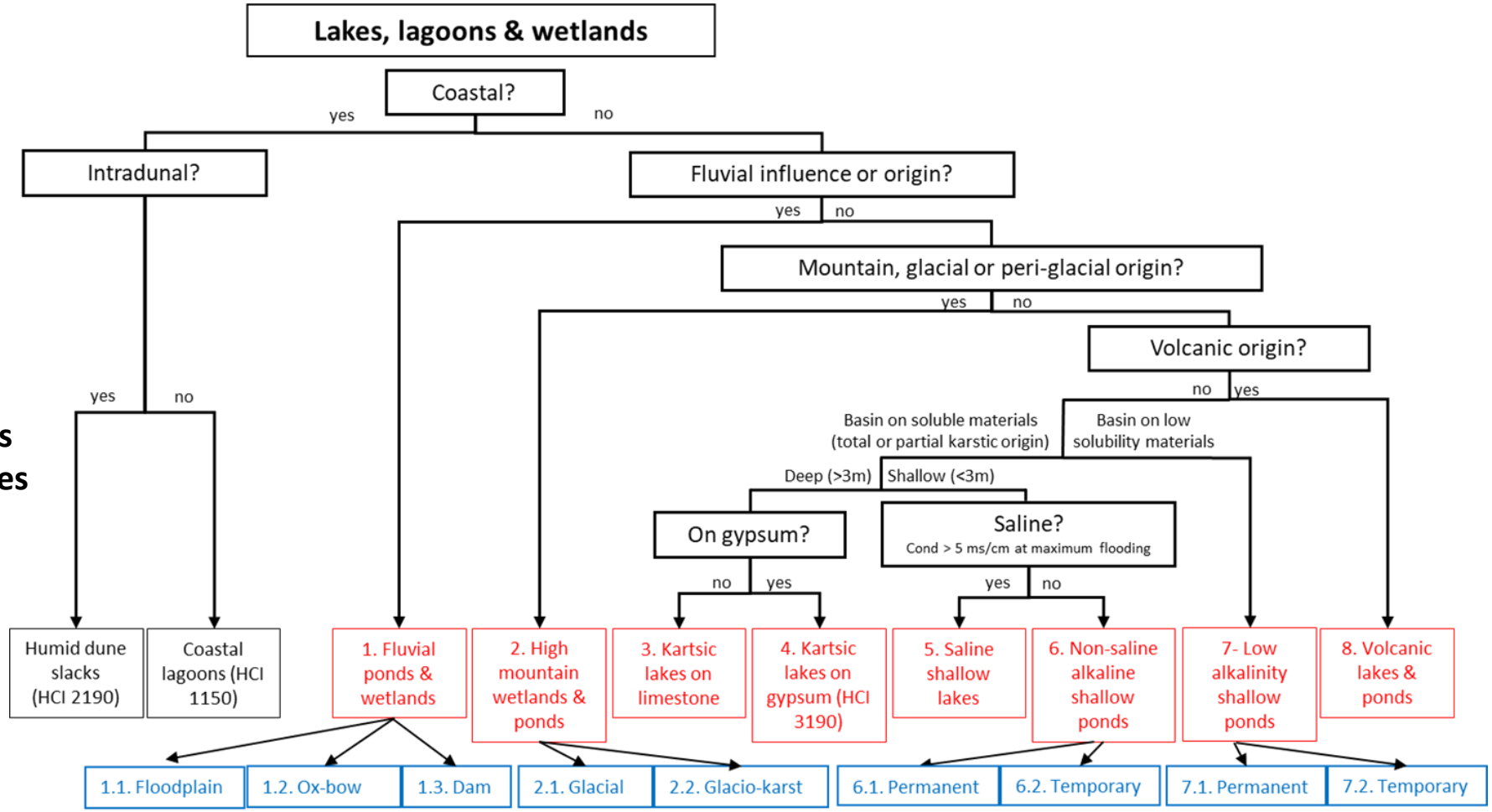
CODE	NAME OF ECOLOGICAL TYPE OF LENITIC ECOSYSTEM
1321	**Fluvial ponds and wetlands**
13211	Fluvial ponds and wetlands in middle-lower reaches on floodplains
13212	Fluvial ponds and wetlands in middle-lower reaches on abandoned meanders (Ox-bow lakes)
13213	Fluvial ponds and wetlands originated by natural damming, on upper reaches
1322	**High mountain lakes and wetlands (glacial or periglacial morphogenesis)**
13221	High mountain lakes and ponds of glacial origin, northern and central.
13222	High mountain lakes and ponds of glacial-karstic origin, northern and central.
13223	Southern high mountain lakes and ponds
13224	High mountain shallow wetlands
1323	**Karstic (exokarstic) lakes on limestone formed by dissolution and collapse (sinkholes)**
1324	**Karstic (exokarstic) lakes on gypsum formed by dissolution and collapse (sinkholes)**
13241	Small lakes on gypsum karst (sublacustrine water feeding).
13242	Large lakes on gypsum karst, deep, with mixed inlet (sublacustrine and surface water feeding)
1325	**Saline shallow lakes (induced karstic processes, non-functional karst, or other origins).**
13251	Temporary shallow hypo-mesosaline lakes
13252	Temporary shallow hypersaline lakes
13253	Soda lakes
13254	Permanent saline lakes
1326	**Non-saline shallow ponds and wetlands (induced karstic origin) with alkaline waters (6.1.- permanent or 6.2.- temporary).**
13261	Non-saline shallow ponds and wetlands with alkaline waters, permanent
13262	Non-saline shallow ponds and wetlands with alkaline waters, temporary
1327	**Non-saline shallow ponds and wetlands (morphostructural origin) with low alkalinity waters (7.1.- permanent or 7.2- temporary).**
13271	Non-saline shallow ponds and wetlands (morphostructural origin) with low alkalinity waters, permanent
13272	Non-saline shallow ponds and wetlands (morphostructural origin) with low alkalinity waters, temporary
1328	**Volcanic lakes**
13281	Mountain volcanic lakes
13282	Piedmont volcanic lakes
13283	Sedimentary basin volcanic lakes

Introduction

Lenitic ecosystems (lakes and ponds) classification

Main biophysical control factors criteria:

- **Climatic**
- **Geomorphological**
- **Geological and edaphic factors**
- **Hydrological factors**
- **Physiographic factors**
- **Water physicochemical characteristics**
- **Components of biological communities**
- **Structural features of the community**
- **Biological processes**
- **Exchanges with other ecosystems**
- **Anthropic factors**



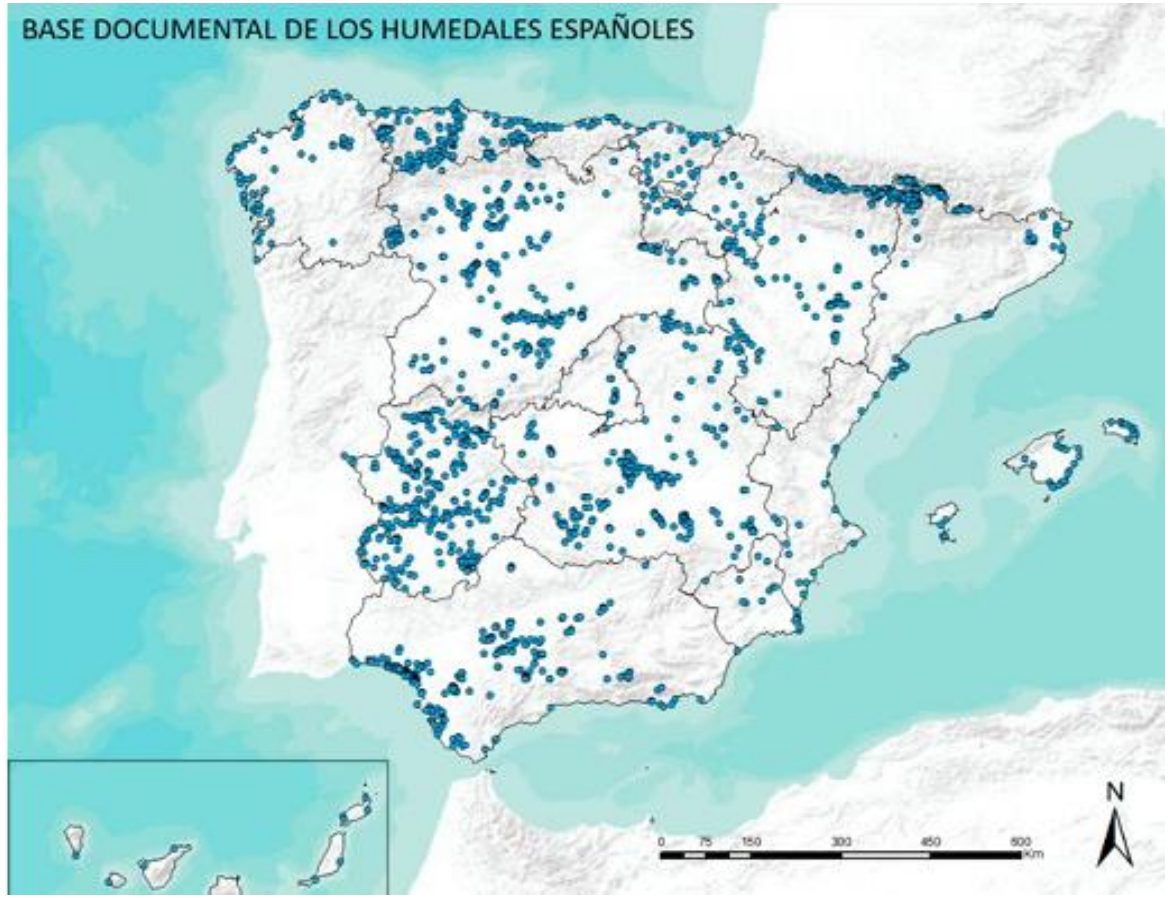
Dichotomous key. Main ecological types corresponding to group 31 habitat types.

Methodology

Favourable "conservation status" criteria

The **General Evaluation Matrix** for assessing the conservation status of Habitat Types of Community Interest (HTCI) in Europe (European Commission, 2011; DG Environment, 2017) requires the evaluation of the '*Structure and Functions*' parameter. The previous criteria establish that:

- **Local scale in each specific site** or at least in a representation thereof.
- The structural and functional characteristics must **remain within natural variability limits**.
- In terms of structure, **physical features and biological community.**
- In terms of function, **processes and interactions, whether biotic, abiotic, or mixed**.
- These aspects should be **parameterised**, which must be descriptive of the structure and/or functions.
- The values of these variables **must be compared with the reference conditions**.



Methodology

Procedures for monitoring the 'Structure and Functions' parameter: ECLECTIC Index

This methodology, developed by the University of Valencia, is based on the ECLECTIC Index (Spanish acronym for "Estado de Conservación de las Lagunas y Humedales Españoles Catalogados por Tipologías: Indicadores de Conservación").

- This index seeks to assess the conservation status 'Structure and Functions' using variables at a local scale.
- It includes variables related to biological communities, as well as hydrogeomorphological and physicochemical factors, together with their response to observed pressures and impacts.
- The characteristics of the HTCI, as defined in the aforementioned Directive, are used as mandatory reference points in the assessment.
- The index is applicable to habitat types in Group 31 of Annex I of the Habitats Directive, as well as to other HTCIs whose structure and functions are determined by the presence of stagnant water.
- The variables used are compatible with, and in some cases identical to, those used in the Water Framework Directive.

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Methodology

Procedures for monitoring the 'Structure and functions' parameter: ECLECTIC Index.

The ECLECTIC index is structured into four evaluation blocks, each of which can score between 0 and 25 points

BLOCK 1	BLOCK 2	BLOCK 3	BLOCK 4
Typical Vegetation	Other biological factors	Hydrogeo morphological factors	Physical & chemical factors
HTCI vegetation % covered by each species and their abundance	Condition of the biological community (phytoplankton, zooplankton, benthic invertebrates, fish, and amphibians,…)	Variables related to the physical environment of the habitat type (e.g. hydrological regime)	Indicators of water quality (inorganic nutrients, pH, mineral content, water transparency and dissolved oxygen)

Methodology

Variables included in the assessment of the ECLECTIC index.

	BIOLOGICAL FACTORS	Typical vegetation **(Block 1)**	Coverage of typical hydrophyte's species (submerged or floating plants)
			Community composition and coverage of helophytes and riparian vegetation
			Diversity (species richness) of typical or characteristic species representative of submerged, helophytic, and riparian vegetation of the habitat type
		Composition, abundance and biomass of phytoplankton **(Block 2)**	Phytoplankton biomass (chlorophyll-a concentration)
			Composition of the phytoplankton community
			Appearance of a deep chlorophyll maximum and presence of photosynthetic bacteria populations in anoxic layers in summer
		Composition and abundance of invertebrate fauna **(Block 2)**	Number of branchiopods and copepods taxa
			Zooplankton/phytoplankton trophic ratio
			Number of benthic invertebrate taxa in the littoral area
		Composition, abundance and age structure of fish fauna **(Block 2)**	Proportion of individuals of allochthonous species
		Diversity of amphibians and reptiles **(Block 2)**	Number of species
		Other aquatic fauna and flora (rare, threatened, protected, exotic species) **(Block 2)**	Number of taxa from Annexes II and IV of the Habitats Directive, and exotic species, weighted by their indicator value
	HYDROGEO-MOPHOLOGICAL FACTORS	Surface area **(Block 3)**	Habitat type surface area
		Hydrological regime **(Block 3)**	Filling system
			Emptying system
			Hydroperiod
		Geomorphological characteristics **(Block 3)**	Dynamic status
			Geomorphological setup
			Siltation
	PHYSICA & CHEMICAL FACTORS	General **(Block 4)**	Water transparency
			Daily variation of oxygen saturation (%)
			Water electrical conductivity range
			pH
			Total phosphorus concentration
			Water colour
			Salinity of the associated aquifer
		Specific pollutants	This is not considered here as they are accounted as pressures and impacts

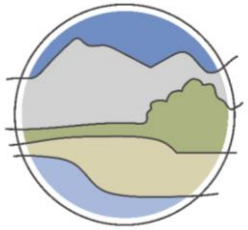
Methodology

Procedures for monitoring the 'Structure and functions' parameter: ECLECTIC Index.

Given that the score assigned to each evaluation block—following the weighting of its constituent variables (Camacho et al., 2009)—must range from 0 to 25, the overall ECLECTIC Index, derived from the sum of the four blocks, will therefore range from 0 to 100.

ECLECTIC index values equal to or greater than 70 indicate a favourable status for the 'Structure and Functions' parameter within the general matrix. Values below 50 reflect an unfavourable-bad status, while scores ranging from 50 to 69 are classified as unfavourable-inadequate

References



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Monitoring the Conservation Status of Habitat Types. Lakes, lagoons, and inland wetlands**.** Scientific and technical manual series. Ministry for the Ecological Transition and the Demographic Challenge. Government of Spain.

- Estimating change rates in the parameter “occupied surface area” for inland lentic habitat types.
- Variables required to calculate the Eclectic Index (see Annex).
- Use of remote sensing to characterize the conservation status of each inland lentic habitat type.
- Estimating pressures and threats affecting the conservation status of inland lentic habitat type (see Annex).
- Inland lentic habitat types and ecosystems in Spain.
- Definition of scientific and technical criteria for proposing monitoring sites or reference locations for the various inland lentic habitat types.

Thank you for the attention

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