

AWOM

AQUATIC WARBLERS ON THE MOVE

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LIFE AQUATIC WARBLERS ON THE MOVE

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Abbreviations

AssACROLA	Association ACROLA
AWOM	Aquatic Warblers on the Move
BV	Bretagne Vivante
BWK	Biologische Waarderingskaart
CLM	Castilla-la-Mancha
CV	Comunidad Valenciana
CYL	Castilla y Leon
EUNIS	European Nature Information System
GONm	Groupe Ornithologique Normand
FGN	Fundación Global Nature
GIS	Geographic information system
ICNF	Instituto da Conservação da Natureza e das Florestas
ICO	Institut Català d'Ornithologia
MdE	Maison de l'Estuaire
SAP	Species Action Plan
SPEA	Sociedade Portuguesa para o Estudo das Aves
WIACO	Wetlands International Afrique - Côte Occidentale et Golfe de Guinée

Executive Summary

Within the LIFE AWOM project, habitat mapping will serve as a key method for assessing the success of restoration actions. All LIFE AWOM sites are to be mapped prior to any intervention, providing a **baseline habitat assessment**. A second mapping campaign will take place during the final year of the project, after restoration activities have been completed, serving as the **final habitat assessment**. The comparison of baseline and final maps will enable site-specific analysis of vegetation and habitat changes attributable to restoration measures.

This document presents the baseline habitat mapping for the majority of sites and outlines the reasons for any remaining unmapped areas or their alignment with restoration timelines.

1. Introduction

For a stopover or wintering site to be suitable for the Aquatic Warbler, several habitat conditions must be met. Floristic composition plays a key role: as a marshland songbird, the AW depends on low wetland vegetation and, to some extent, reed beds. Habitat structure is equally important, including vegetation height and density, the presence of open water, and the mosaic of different habitat types.

At the flyway scale, wetlands often fail to meet all of these requirements. Many sites contain suitable habitats that are degraded, under pressure, too limited in surface area, or lacking sufficient habitat heterogeneity. Habitat management and restoration therefore represent essential tools for improving wetland suitability and enabling sites to function as stable stopover and wintering areas for the species.

Within the LIFE Aquatic Warblers on the Move (LIFE AWOM) project, the aim is to develop a network of well-conditioned sites across the flyway. To achieve this, **24 sites** – covering a total of **c. 1.119 hectares** – will undergo restoration using various techniques. Assessing the effectiveness of these restoration actions is a critical component of the project.

Restoration success will be evaluated through a before-and-after comparison of Aquatic Warbler-suitable habitats¹. This required the production of a baseline habitat map for each LIFE AWOM site prior to the start of restoration activities. For some sites, existing maps produced under previous projects are available, although based on different habitat or vegetation typologies. For others, baseline mapping has been completed or is planned within the LIFE AWOM framework. In several cases, mapping is not yet available; however, this is aligned with the restoration schedule. The key requirement is that mapping be completed before restoration begins. As some sites will only undergo restoration in 2026 or 2027, baseline mapping for these areas is less urgent than for sites scheduled for restoration in 2025. For sites without available mapping, information is provided regarding their status, restoration timeline, and planned mapping activities.

This document presents the baseline habitat mappings for most LIFE AWOM sites. For the few sites where mapping is still pending, relevant contextual information and the expected timeline for restoration and mapping are included.

¹ Other indicators will also be used within the LIFE AWOM to assess restoration success. In particular, birds will be tracked before and after restoration actions (using telemetry). This should provide valuable information, although the potentially small sample size of tagged birds could limit the conclusiveness of the results.

2. Habitat suitability

As stated above, a certain number of elements regarding habitats must be met for a wetland to be suitable to the Aquatic Warbler. First of all, floristic composition is very important, since the Aquatic Warbler prefers low wetland vegetation, including bulrush, rushes, sedges, wet meadows, or even saltmarshes, but also reed beds. However, vast homogeneous reed bed expanses are much less suitable to the species.

Beyond this floristic composition, habitat structure is also essential, including diverse elements. Vegetation height and density are important factors, but the main one is the interweaving of different habitats to form a mosaic. Hence, the most important factor is the alternation of high and low vegetation. High vegetation seems preferred to rest and hide, whereas low vegetation seems to be favored for feeding purposes. Presence of open water (ponds, channels, watercourses) is also essential, since its linear riverbanks are a prey-rich ecotone. Open water surfaces might also serve as nocturnal landmarks.

3. Classifications and typologies

At an AWOM scale, several habitat or vegetation based classification systems exist are currently in use. The European Nature Information System (EUNIS) classification and Natura 2000 habitat types are widely used across Europe, alongside phytosociology. Other systems exist at more regional scales, such as the Biologische Waarderingskaart (BWK) in Flanders, Belgium. However, these typologies are not always directly comparable from an Aquatic Warbler habitat-suitability perspective. Habitat structures and vegetation in Spain or southern France, for example, differ from those found in northern France or Belgium, making cross-country assessments challenging.

In France, a dedicated typology was developed in 2014 within the national Species Action Plan (SAP) (see Annex 1): the ACROLA typology. This system categorizes habitats according to the species-specific suitability criteria described earlier, with a focus on conditions relevant during autumn migration. Currently applied at the national scale, the ACROLA typology will need to be expanded to incorporate wetland vegetation and habitat types from other AWOM countries. Such an extension would enable the use of a harmonised, transnational methodology for identifying and characterizing suitable Aquatic Warbler habitats across the species' migratory range.

4. Methodology for the baseline habitat mapping

The work on baseline habitat mapping, designed to support the assessment of restoration success, will be carried out in several stages.

First, most baseline maps will be compiled using pre-existing habitat classifications, including Natura 2000, EUNIS, and phytosociology. For several sites whose habitats resemble those of the French Atlantic coast, the ACROLA typology has already been applied.

Second, wetland vegetation and habitats types used by the Aquatic Warbler in other AWOM countries will be integrated into the ACROLA typology. This concerns primarily Mediterranean, Iberian, and Senegalese vegetation, as Belgian wetland vegetation is largely comparable to that of the French Atlantic region. The objective is to ensure that any wetland in any AWOM country can be mapped consistently using this unified typology.

Third, existing baseline habitat maps from AWOM sites will be “translated” into ACROLA typology. One of the strengths of the ACROLA system is the presence of gateways linking it to other methodologies. However, these correspondences must be verified in the field to ensure accuracy.

Finally, in 2029, the final habitat (post-restoration) mapping will be conducted directly using the ACROLA typology. Applying the same classification system to both the baseline and final maps will greatly facilitate comparisons across sites and through time. This implies that AWOM partners will be trained during the course of the project to use the ACROLA typology confidently and independently.

In the following section, baseline habitat information for all 24 AWOM sites across five countries is presented. For sites where habitat mapping already exists, three elements are provided:

- Orthophoto imagery – offers an initial visual overview of the site’s footprint.
- Vegetation or habitat maps – uses existing classifications (EUNIS, phytosociology, etc.). For sites mapped in high detail through phytosociology, some associations have been grouped to simplify readability and provide a clearer first impression.
- Habitat areas – lists the surface areas occupied by each habitat type. For phytosociology maps, this also includes the correspondence between the initial associations and the simplified groupings.

5. Baseline habitat mapping

5.1 Belgium

In Belgium, a **single site** is included in the LIFE AWOM project: *De Blankaart Nature Reserve*. Restoration work and associated actions at this site are supported by **Natuurpunt**.

5.1.1 De Blankaart

De Blankaart Nature Reserve covers 350 hectares in the Yser valley, in Flanders, north-western Belgium. It forms part of the Natura 2000 site BE2500831 “Ijzervallei” and is one of the oldest protected wetlands in the country. Known for its rich birdlife, the site offers suitable stopover habitats for the Aquatic Warbler during autumn migration, particularly through its extensive reedbeds and marsh vegetation. The mapped area covers 103.89 hectares (**Figure 1**).

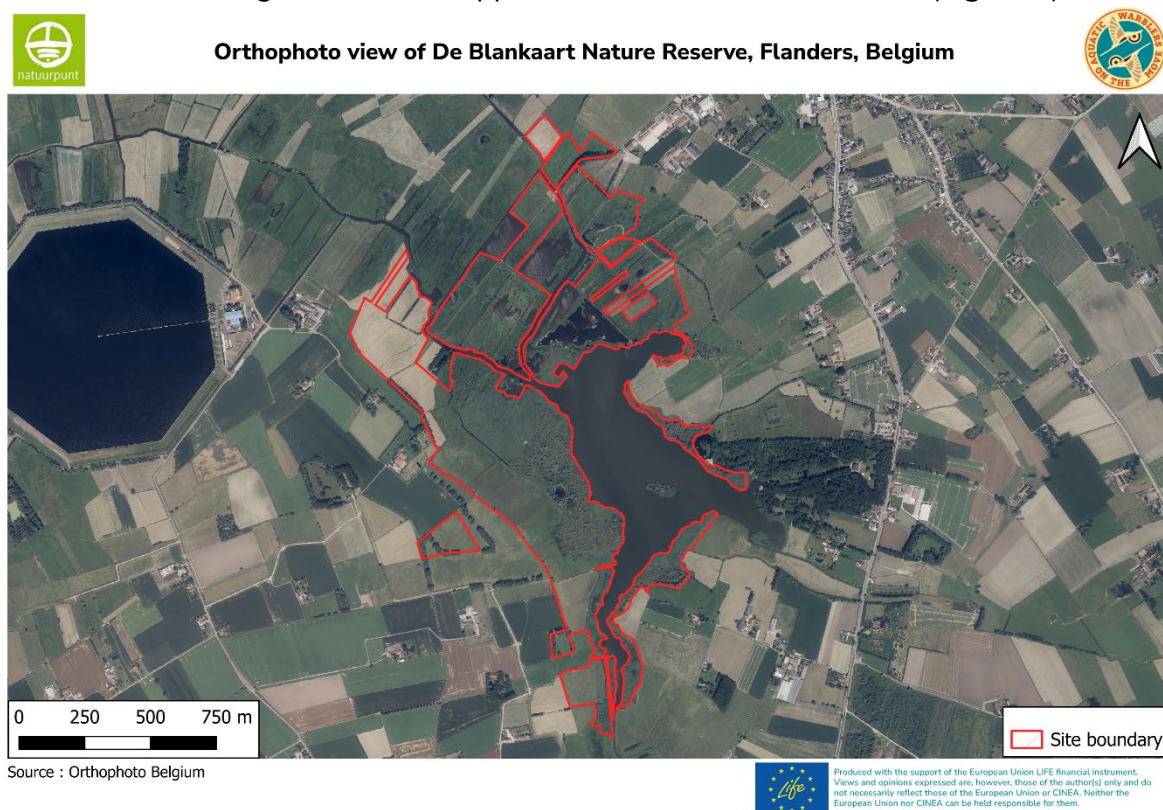


Figure 1 : Orthophoto view of De Blankaart Nature Reserve, Belgium

Habitat mapping for this site has already been translated into the ACROLA typology and reveals a mosaic of wetland habitat types (**Figure 2**).



Simplified habitat mapping of De Blankaart Nature Reserve, Flanders, Belgium
Included in Natura 2000 BE2500831 - Ijzervallei

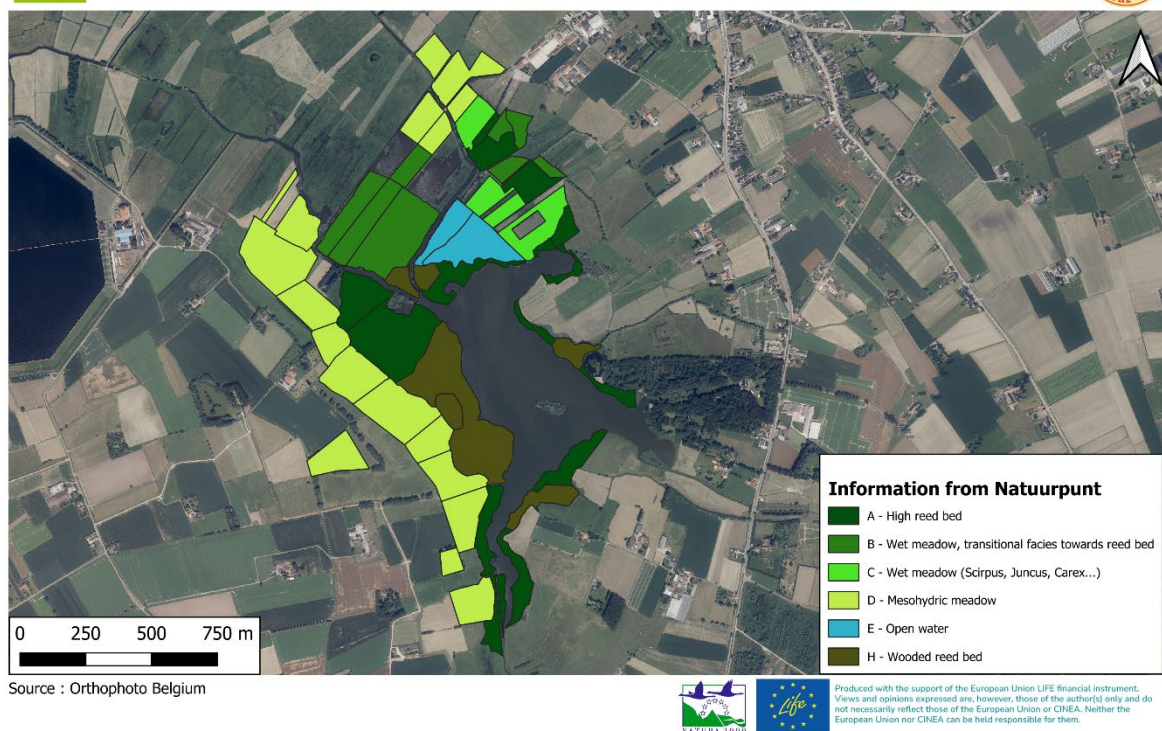


Figure 2 : Simplified habitat mapping of De Blankaart Nature Reserve, Belgium

Mesohydric meadows constitute the most important proportion of habitats, followed by high reedbeds, wet meadows with reedbeds, and wooded reedbeds (**Table 1**). Additional features include open water bodies and wet meadows.

Table 1 : Total area of each habitat type identified at De Blankaart Nature Reserve

Habitats	Area (hectares)
A - High reed bed	24.4
B - Wet meadow, transitional facies towards reed bed	14.79
C - Wet meadow (<i>Scirpus</i> , <i>Juncus</i> , <i>Carex</i> ...)	6.5
D - Mesohydric meadow	37.85
E - Open water	5.33
H - Wooded reed bed	15.02

5.2 France

In France, **three wetlands** will be restored within the LIFE AWOM. Restoration activities will be carried out by different French partners: **Maison de l'Estuaire (MdE)**, **Groupe Ornithologique Normand (GONm)**, and **Association ACROLA (AssACROLA)**.

5.2.1 Seine Estuary (MdE)

With an area of 8,528 hectares, the *Seine Estuary National Nature Reserve* is one of the three most important estuaries in France. It forms part of the Natura 2000 site FR2310044 “Estuaire et marais de la Basse Seine” and is one of country’s main autumn stopover sites for the Aquatic Warbler. The extensive wetlands and reedbeds provide highly suitable conditions for the species, particularly when maintained as a diverse mosaic of habitats. To further improve habitat suitability, 4.5 hectares of reedbeds will be opened (**Figure 3**).

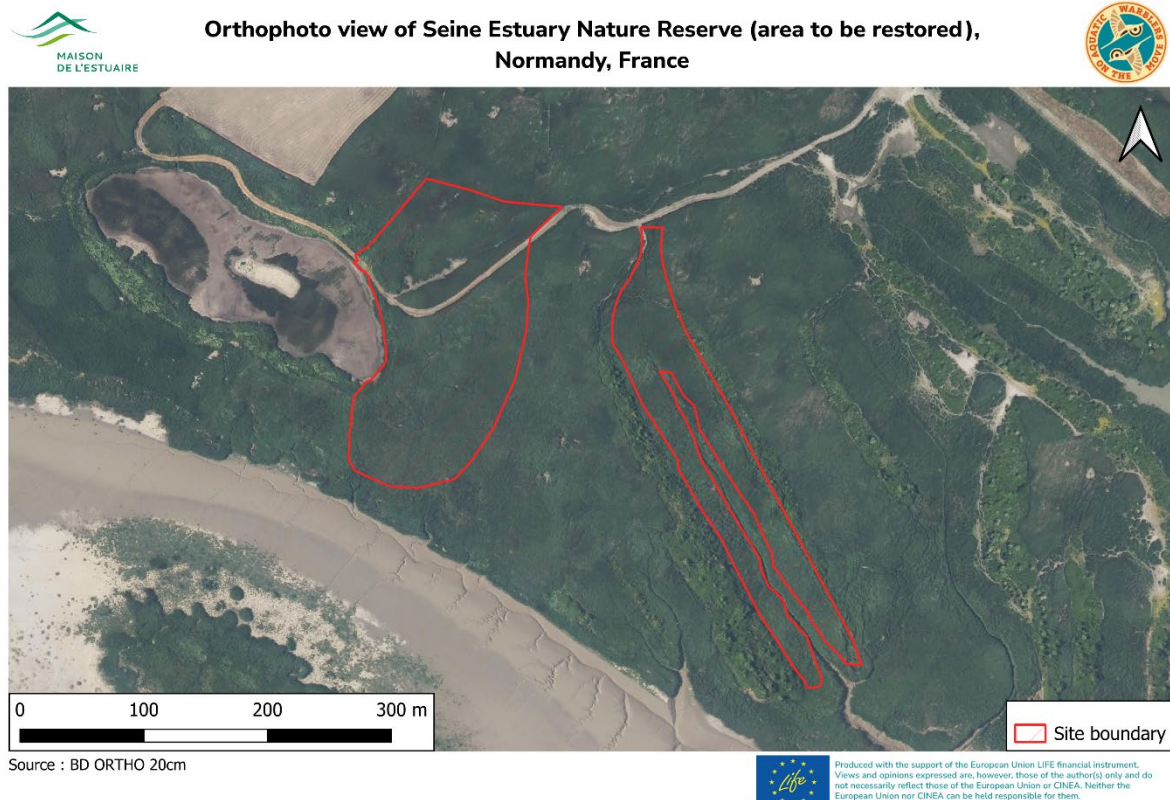


Figure 3 : Orthophoto view of Seine Estuary Nature Reserve (area to be restored), France

The area targeted for restoration is dominated by high reedbeds, with a smaller proportion of salt marshes (**Figure 4** and **Table 2**).



Figure 4 : Habitat mapping of Seine Estuary Nature Reserve (area to be restored), France

Table 2 : Total area of each habitat type identified at Seine Estuary Nature Reserve (area to be restored)

Habitats	Area (hectares)
High reed bed with <i>Phragmites australis</i>	4.44
High saltmarshes with <i>Elytrigia acuta</i>	0.024

5.2.2 RNR des Marais de la Taute (GONm)

The *Marais de la Taute Regional Nature Reserve* forms part of the *Marais du Cotentin et du Bessin National Park*. It comprises six different units, covering a total of 147 hectares. The reserve is also included in the Natura 2000 site FR2510046 “Basses vallées du Cotentin et Baie des Veys”, an important autumn stopover site for the Aquatic Warbler. Within LIFE AWOM, **four sectors** will be restored to enhance habitat diversity: Les Défends, Première pièce Rigault, Gabion SCI and Saint-Hilaire.

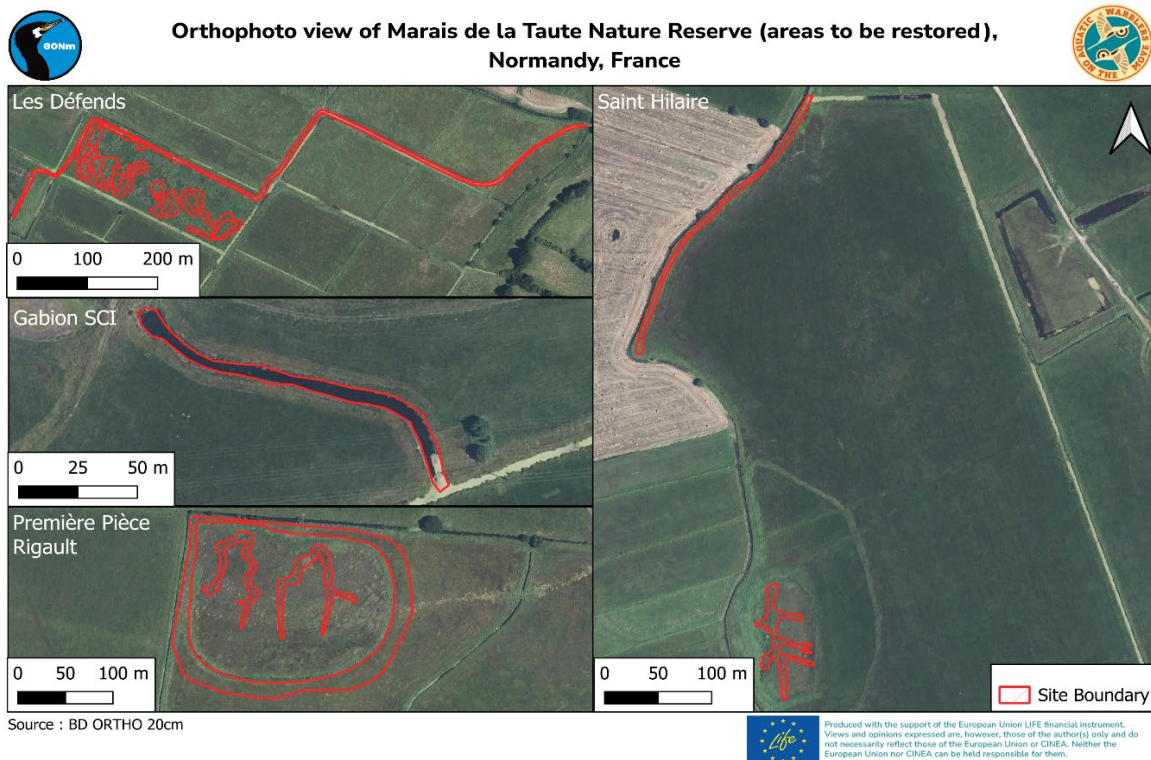


Figure 5 : Orthophoto view of Marais de la Taute Nature Reserve (areas to be restored), France

Habitats in these four sectors were mapped using EUNIS classification (Figure 6).

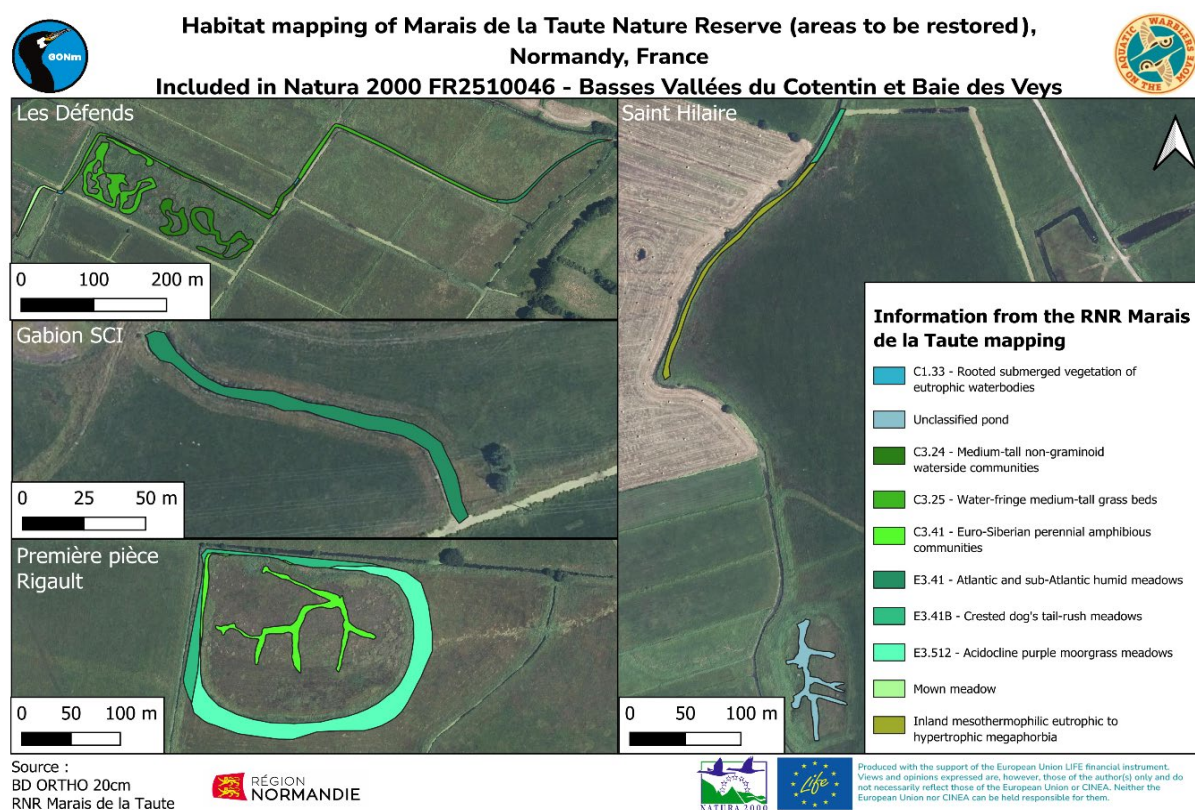


Figure 6 : Habitat mapping of Marais de la Taute Nature Reserve (areas to be restored), France

The habitats were then compared with available phytosociological data for the sites (**Table 3**). For analysis, information from the four sectors has been pooled.

Across the combined area, half of the area is covered by diverse types of grassland, 27% is dominated by meadows with *Molinia* spp., and submerged vegetation represents around 10% of the total area.

Table 3 : Total area of each habitat type identified at Marais de la Taute Nature Reserve (areas to be restored)

Detailed vegetations	Area (hectares)	Simplified habitats	Area (hectares)
<i>Elodeetum canadensis</i>	0.003	C1.33 - Rooted submerged vegetation of eutrophic waterbodies	0.007
<i>Potamion pectinati</i>	0.004		
<i>Oenanthion fistulosae</i>	0.36	C3.24 - Medium-tall non-graminoid waterside communities	0.36
<i>Glycerietum maximae</i>	0.57	C3.25 - Water-fringe medium-tall grass beds	0.57
<i>Elodo palustris</i> - <i>Sparganion</i>	0.32	C3.41 - Euro-Siberian perennial amphibious communities	0.26
<i>Agrostietea stoloniferae</i>	0.09	E3.41 - Atlantic and sub-Atlantic humid meadows	0.16
<i>Hordeo secalini</i> - <i>Lolietum perennis</i>	0.07		
<i>Ranunculo repentis</i> - <i>Cynosurion cristati</i>	0.2	E3.41B - Crested dog's tail-rush meadows	0.23
<i>Junco acutiflori</i> - <i>Cynosuretum cristati</i>	0.03		
<i>Cirsio dissecti</i> - <i>Scorzoneretum humilis</i>	0.73	E3.512 - Acidocline purple moorgrass meadows	0.73
<i>Convolvulion sepium</i>	0.1	Inland mesothermophilic eutrophic to hypertrophic megaphorbia	0.1
Unclassified pond	0.13	Unclassified pond	0.13
Mown meadow	0.04	Mown meadow	0.04

5.2.3 Pipy Island (AssACROLA)

Pipy Island forms part of the Natura 2000 site FR5210103 “Estuaire de la Loire”. Marshes within this site have been known to host a significant proportion of the migrating Aquatic Warbler population. However, since 2010, successive periods of droughts combined with sediment accumulation from spring tides have significantly altered the habitat. As a result, the area has become increasingly unsuitable for the species. The objective of the restoration action is to rejuvenate the selected site by removing the layer of sediment deposited over the past 20-30 years, thereby re-establishing the ecological functions of the wet meadow. The intervention will be carried out on an area of 4.2 hectares (**Figure 7**).

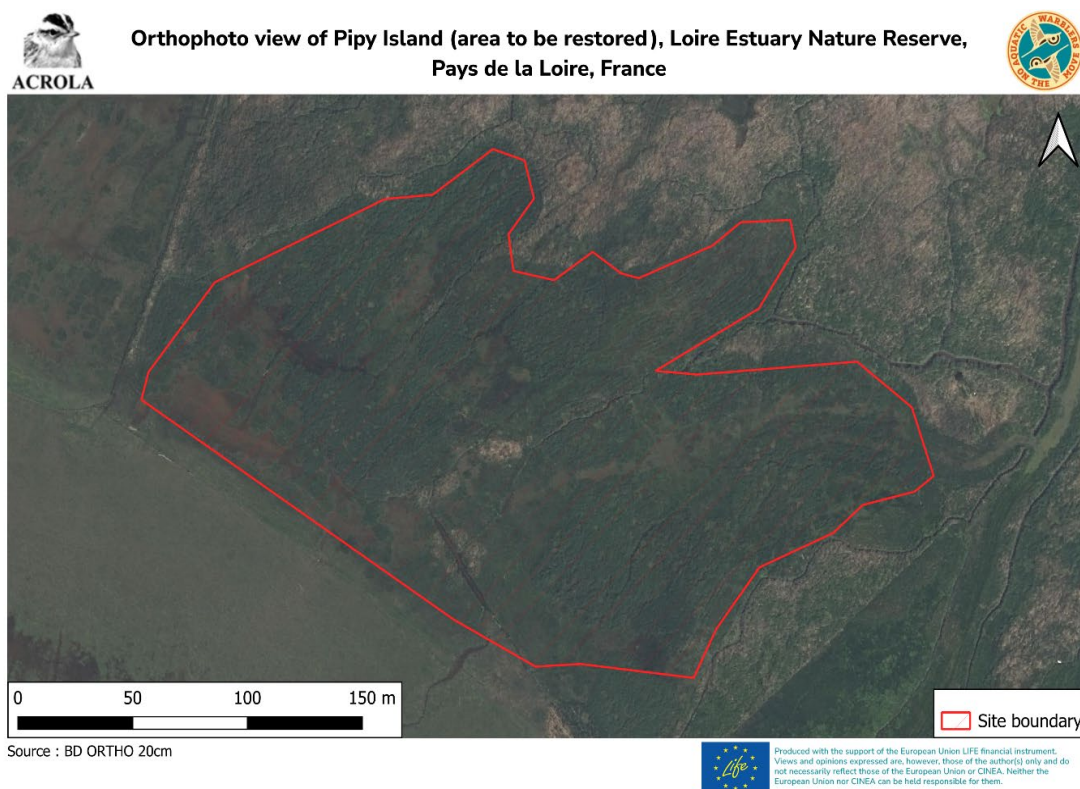


Figure 7 : Orthophoto view of Pipy Island (area to be restored), Loire Estuary Nature Reserve, France

Habitats on this restoration site have been mapped using Corine Biotopes (**Figure 8**).

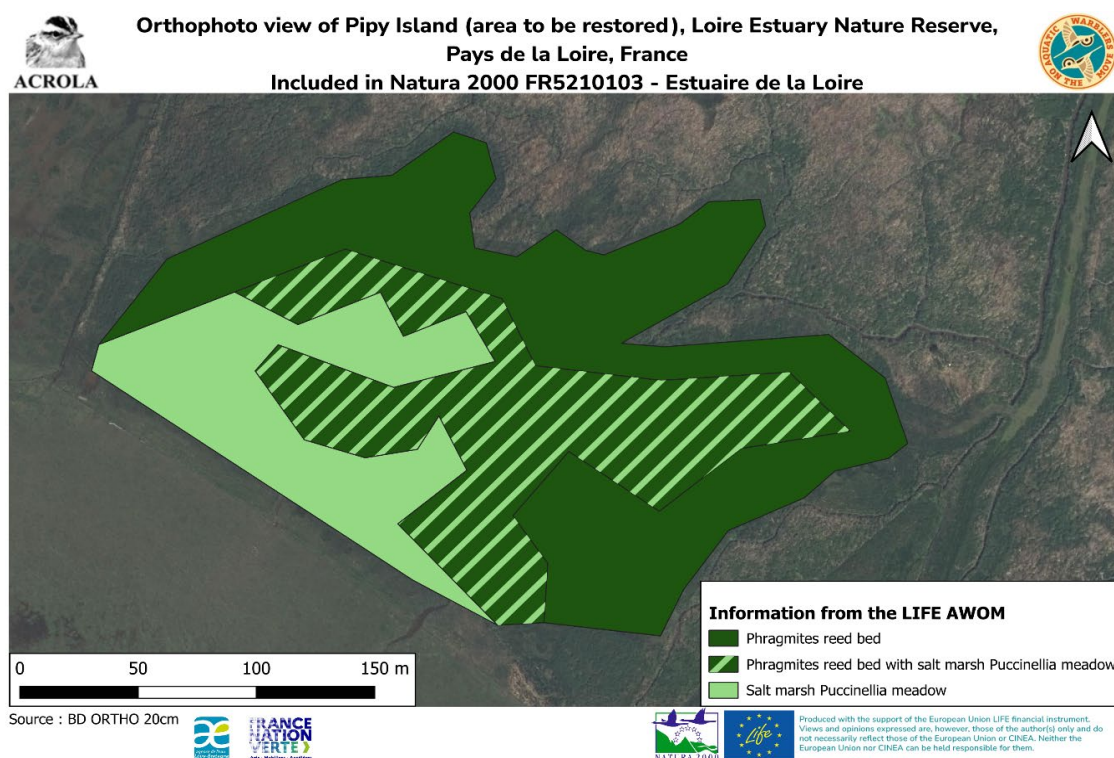


Figure 8 : Habitat mapping of Pipy Island (area to be restored), Loire Estuary Nature Reserve, France

Two main habitat types dominate *Pipy Island*: approximately half of the area consists of reedbed (*Phragmites australis*), while salt marsh with *Puccinellia* meadow accounts for about 20% (Table 4). The remaining third is a mosaic of these two types of habitat.

Table 4 : Total area of each habitat type identified at *Pipy Island* (area to be restored), Loire Estuary Nature Reserve, France

Habitats	Area (hectares)
Salt marsh <i>Puccinellia</i> meadow	0.9
<i>Phragmites</i> reed bed with salt marsh <i>Puccinellia</i> meadow	1.4
<i>Phragmites</i> reed bed	1.9

5.3 Spain

Spain hosts **16 restoration sites** distributed across 11 Natura 2000 sites. One of these sites, located in Catalonia, north-eastern Spain, is supported by **Institut Català d'Ornithologia (ICO)**. The remaining 15 sites are supported by **Fundación Global Nature (FGN)**. Among these, four are situated in **Castilla-la-Mancha (CLM)**, four in **Castilla-y-León (CYL)**, and seven in **Comunidad Valenciana (CV)**.

5.3.1 Aiguamolls de l'Empordà Natural Park

With a total area of 4,731 hectares, the Aiguamolls de l'Empordà Natural Park is located in Catalonia, in north-eastern Spain. It forms part of the Natura 2000 site ES0000019 "Aiguamolls de l'Alt Empordà", and is the principal site for Aquatic Warbler occurrence in Catalonia. Each spring migration season, approximately 10 individuals are detected and ringed at this location. However, over the past three years, the region has experienced severe drought, resulting in the complete drying of the site. The availability of water in the coming years remains uncertain.

Discussions are ongoing with the Natural Park staff and local biologists. If a feasible solution is identified to pump water back into the area, the habitat could remain suitable for the Aquatic Warbler. Conversely, if water supply proves too difficult to secure, restoration efforts may be relocated to another ecologically value area within the Natural Parl. Additional information will be incorporated into this document as soon as it becomes available.

5.3.2 Marjal de Peñíscola

The marjal de Peñíscola covers 130 hectares and is located in CV, on Spain's eastern coast. It forms part of the Natura 2000 site ES5222002 "Marjal de Peñíscola". No continuous bird ringing has been carried out there for more than 20 years, which explains the single Aquatic Warbler record from this wetland. Nevertheless, the site's controlled vegetation structure and regulated flooding levels make it *a priori*, a suitable migratory stopover site for the Aquatic Warbler and other marshlands species during spring migration.

The following mapped area comprises 102 hectares (**Figure 9**).



Figure 9 : Orthophoto view of marjal de Peñíscola, Spain

Ten habitat types have been identified on this site (Figure 10).

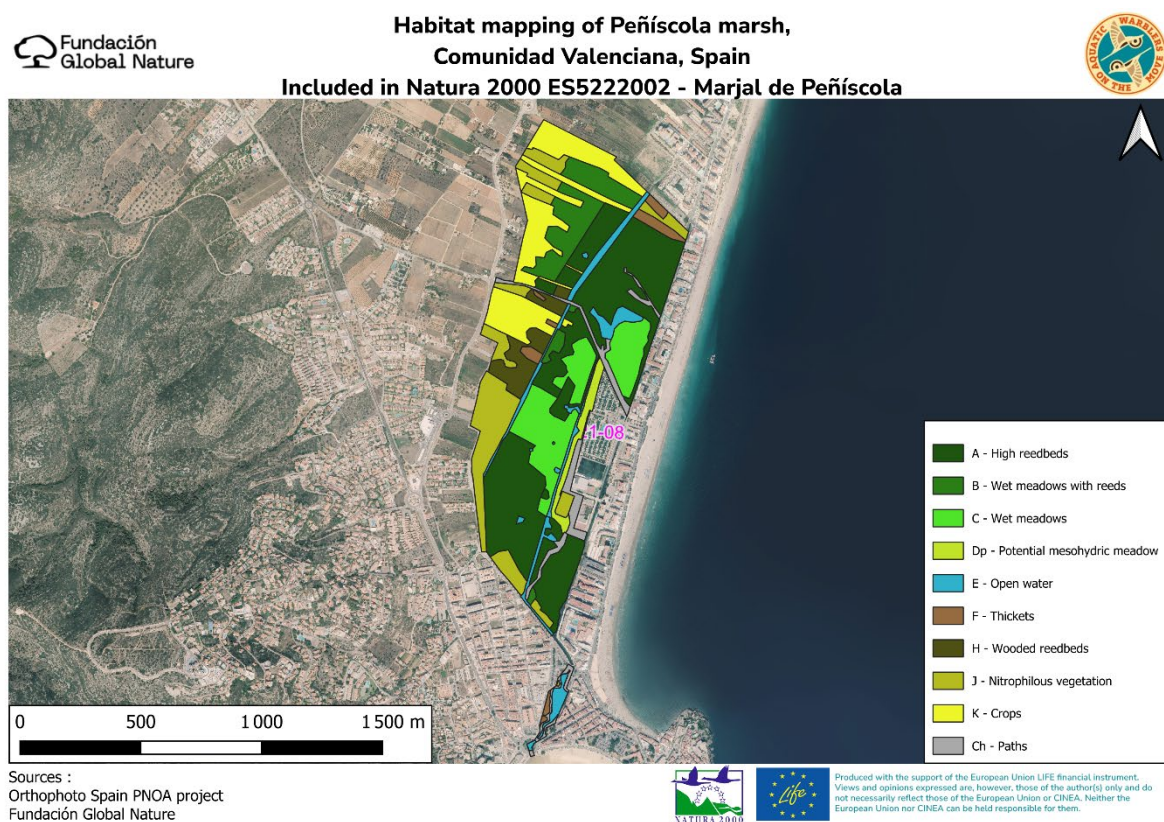


Figure 10 : Habitat mapping of marjal de Peñíscola, Spain

Approximately one third of the site is covered by reedbeds, 12% by wet meadows, and 8% by wet meadows bordered by reeds (Table 5). Open water accounts for 6% of the area, further increasing

its suitability for the Aquatic Warbler. However, crops and nitrophilous vegetation also represent a substantial part of the vegetation, covering 12% and 14% respectively.

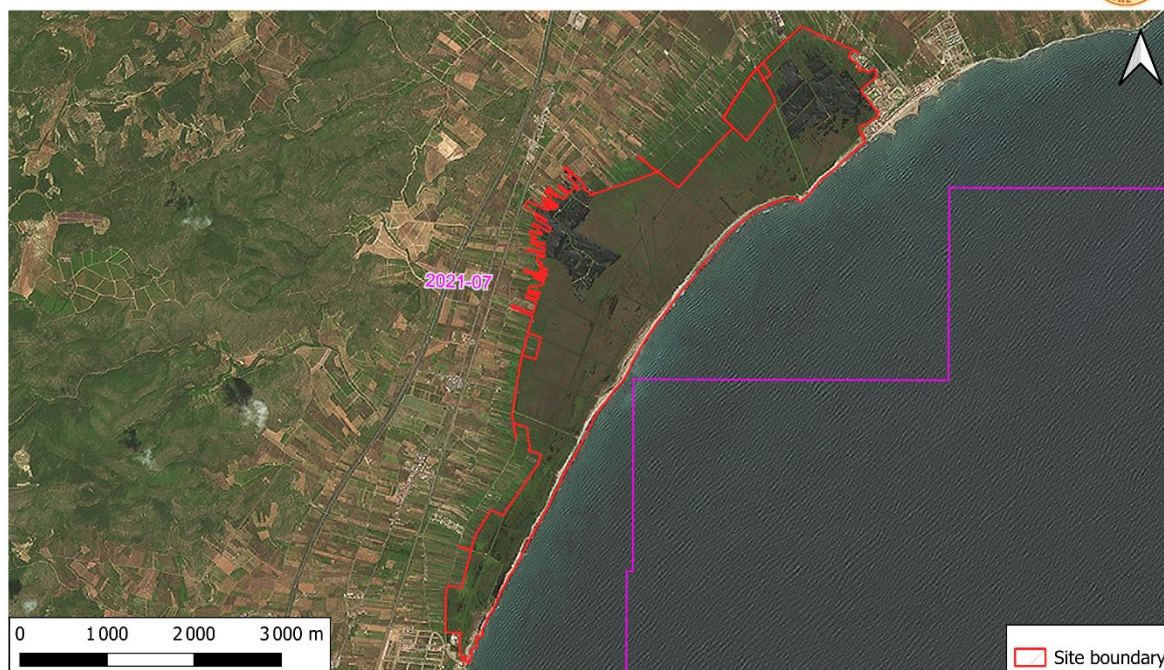
Table 5 : *Total area of each habitat type identified at marjal de Peñíscola*

Habitats	Area (hectares)
A - High reedbeds	35.73
B - Wet meadows with reeds	8.51
C - Wet meadows	12.52
Dp - Potential mesohydric meadows	2.08
E - Open water	5.81
F - Thickets	2.02
H - Wooded reedbeds	4.23
J - Nitrophilous vegetation	12.64
K - Crops	14.52
Ch - Paths	4.48

5.3.3 Prat de Cabanes – Torreblanca

The Prat de Cabanes – Torreblanca Natural Park is also located in CV, close to the Balearic Sea. It forms part of the Natura 2000 site ES0000467 “Prat de Cabanes i Torreblanca”. Covering 848 hectares, this wetland is a marshy meadow of high ecological value and is one of the main sites on the Iberian Peninsula for ringing Aquatic Warblers during spring migration.

The map presented comprises 815 hectares of the Natural Park (**Figure 11**).

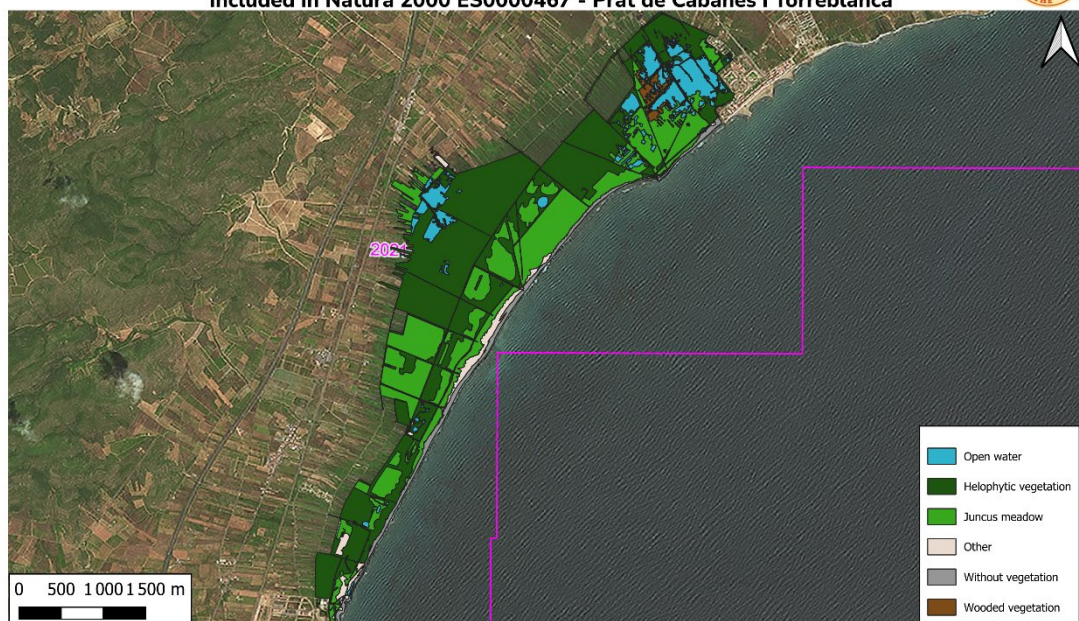


Source : Orthophoto Spain PNOA project

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Figure 11 : Orthophoto view of Prat de Cabanes - Torreblanca Natural Park

This site is primarily composed of four habitat types, along with unvegetated areas and a category grouped as “others” (Figure 12).



Sources :
Orthophoto Spain PNOA project
Fundación Global Nature – LIFE
(LIFE Paludicola & LIFE Wetlands4Climate)



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Figure 12 : Habitat mapping of Prat de Cabanes - Torreblanca Natural Park

More than 80% of the area is covered by helophytic vegetation (reed beds) and *Juncus* meadow (Table 6). Open water is also present, further contributing to its suitability as stopover site.

Table 6 : Total area of each habitat type identified at Prat de Cabanes - Torreblanca Natural Park

Habitats	Area (hectares)
Open water	81.31
Helophytic vegetation	407.86
<i>Juncus</i> meadow	259.86
Other	21.84
Without vegetation	36.67
Wooded vegetation	8.96

5.3.4 Desembocadura del Río Mijares

The site lies within the Natura 2000 site ES0000211 “Desembocadura del riu Millars” and covers 345.85 hectares. As its name indicates, the Desembocadura del Río Mijares represents the final stretch of the Mijares river, the most important river in the province of Castellón, in CV. The permanent presence of water at the river mouth supports a high diversity of fauna, including the Aquatic Warbler. The heterogeneity of habitats is particularly favourable for this species.

Habitat mapping on Desembocadura del Río Mijares has not yet been completed. Within LIFE AWOM, restoration work was planned to begin in October 2025 but has not yet begun. The start date remains uncertain, and the corresponding data will be added to this document once available.

5.3.5 Marjal de Nules

The marjal de Nules is also located in the province of Castellón, in CV, within the Natura 2000 site ES5222005 “Marjal de Nules”. Covering 644.35 hectares, this small coastal lagoon was formed by natural groundwater upwelling. Its diverse habitats and seasonal flooding during spring migration make it an ideal stopover site for the Aquatic Warbler and other marshland birds.

Habitat mapping on marjal de Nules has not yet been completed. Within LIFE AWOM, restoration work was planned to begin in September 2025 but has not yet begun. The start date remains uncertain, and the corresponding data will be added to this document once available.

5.3.6 Marjal dels Moro

The marjal dels Moro is located in CV, within the Natura 2000 site ES0000148 “Marjal dels Moros”. Covering 468 hectares (Figure 13), it is one of the most important areas in Valencia for observing aquatic birds. Previous monitoring initiatives have recoded several Aquatic Warblers, highlighting the site’s importance during spring migration.



Figure 13 : Orthophoto view of marjal dels Moro

As with other wetlands in CV, habitat mapping has been carried out using a simplified typology comprising six categories (**Figure 14**).

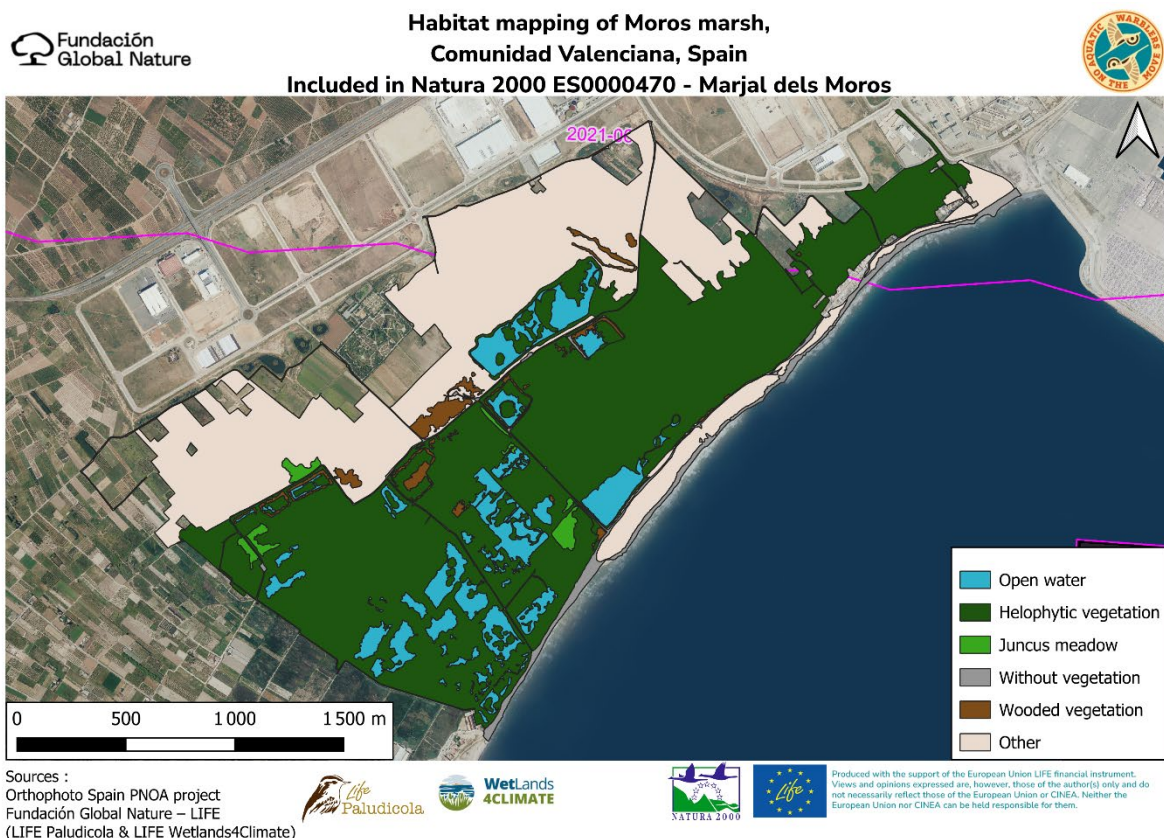


Figure 14 : Habitat mapping of marjal dels Moro marsh

Helophytic vegetation (reedbeds) represents the majority of the habitats on the site (**Table 7**). In the northern sector, “other” habitats account for roughly one third of the area. Several patches of open water are interspersed among reedbeds, and small areas of *Juncus* meadows and wooded vegetation are also present.

Table 7 : Total area of each habitat type identified at marjal dels Moros

Habitats	Area (hectares)
Open water	37.44
Helophytic vegetation	232.85
<i>Juncus</i> meadow	4.01
Other	150.45
Without vegetation	15.39
Wooded vegetation	8.53

5.3.7 L'Albufera

Like the previous wetlands, l'Albufera Natural Park is located in the CV, close to the Balearic Sea, and forms part of the Natura 2000 site ES0000471 “L'Albufera”. Covering approximately 21,120 hectares, it is the most important wetland in the CV and one of the most significant in Spain. Observations of Aquatic Warblers confirm its importance as a spring migration stopover site.

The mapped area corresponds to 3,643 hectares (Figure 15).



Figure 15 : Orthophoto view of l'Albufera Natural Park

Habitat mapping was conducted using the same six category typology applied to the other Valencian wetlands (Figure 16).

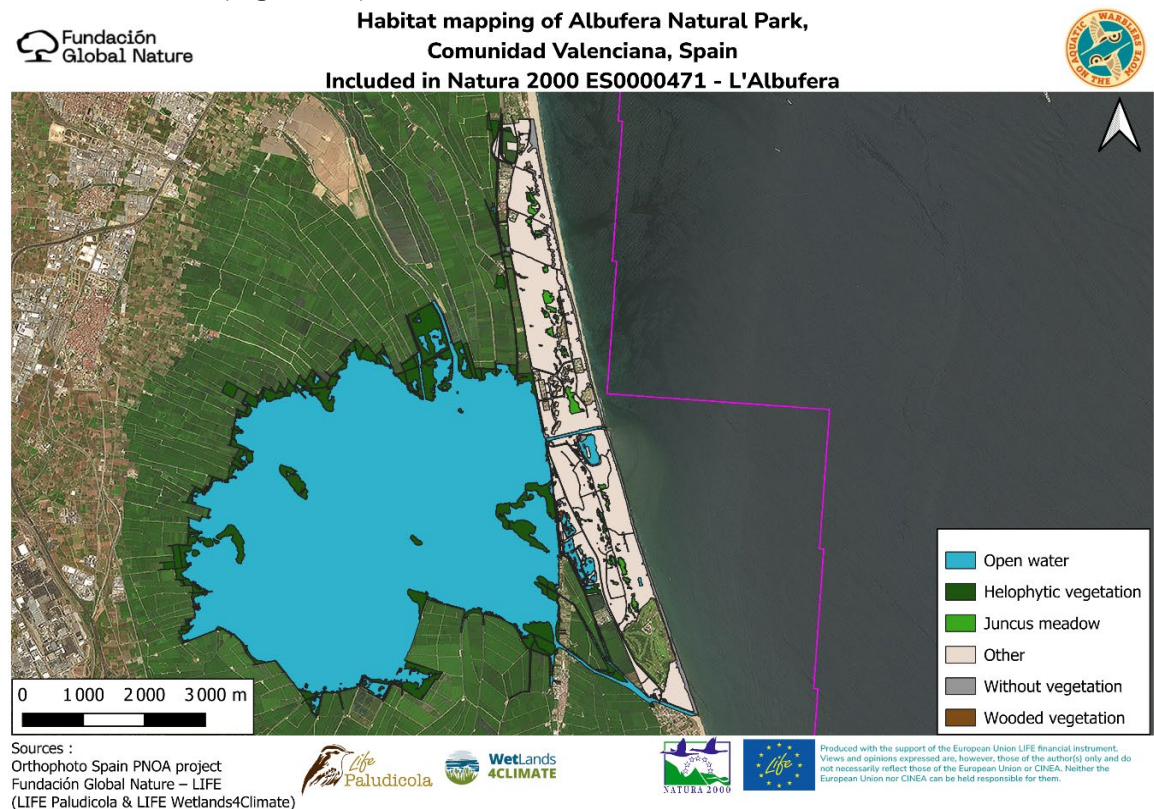


Figure 16 : Habitat mapping of l'Albufera Natural Park

Most of the site is completely flooded, forming a large water body that is generally unsuitable for the Aquatic Warbler (**Table 8**). This water body is surrounded by helophytic vegetation (reedbeds). Additional vegetation occurs in urbanized areas, where small patches of a *Juncus* meadows develop.

Table 8 : Total area of each habitat type identified at l'Albufera Natural Park

Habitats	Area (hectares)
Open water	2504.95
Helophytic vegetation	353.28
<i>Juncus</i> meadow	35.94
Other	622.99
Without vegetation	83.25
Wooded vegetation	8.01

5.3.8 Marjal de Pego-Oliva

Covering more than 1,255 hectares, the marjal de Pego-Oliva is located in CV, close to the Balearic Sea and within the Natura 2000 site ES0000147 “Marjal de Pego-Oliva”. Formerly a silted-up lagoon, it is now one of the most ecologically valuable marshes along the Valencian coast. Bounded to the north and south by the Bullent and Molinell rivers, its aquatic habitats are exceptionally rare in the region. Ringing efforts carried out during previous LIFE projects have confirmed the presence of the Aquatic Warbler, demonstrating the high importance of this wetland as a spring migration stopover site. The mapped area covers approximately 540 hectares (**Figure 17**).



Figure 17 : Orthophoto view of marjal de Pego-Oliva

Habitat mapping was conducted by major habitat type, identifying five categories (**Figure 18**).

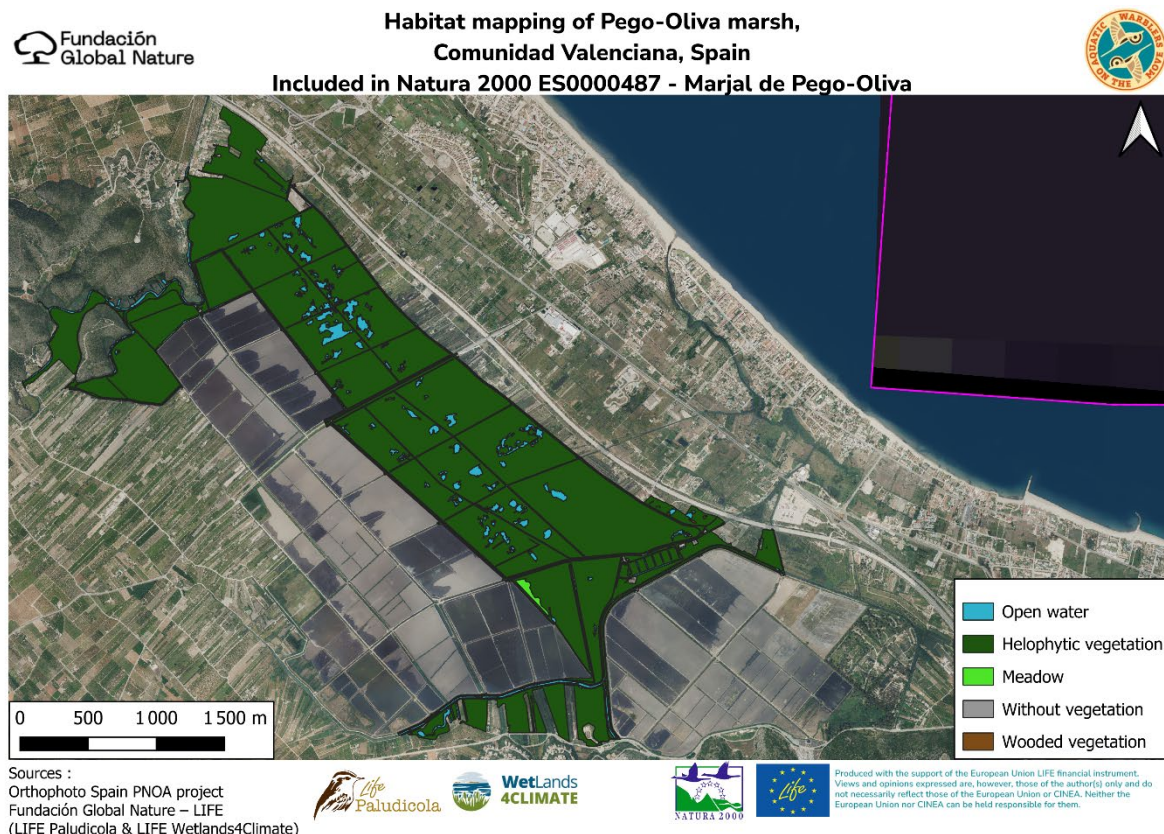


Figure 18 : Habitat mapping of marjal de Pego-Oliva

Nearly 90% of the site is covered by helophytic vegetation (reedbeds), interspersed with small patches of open water (**Table 9**). Unvegetated areas, mainly roads and paths, account for about 2% of the total area.

Table 9 : Total area of each habitat type identified at marjal de Pego-Oliva

Habitats	Area (hectares)
Open water	45.24
Helophytic vegetation	472.58
Meadow	1.21
Without vegetation	9.65
Wooded vegetation	0.14

5.3.9 Laguna de El Longar

El Longar is a seasonal lagoon located in CLM, within the Natura 2000 site ES4250010 “Humedales de La Mancha”. Covering more than 410 hectares (**Figure 19**), the lagoon includes halophilic vegetation formations of high ecological interest. The inflow of freshwater into El Longar supports the development of reedbeds, creating suitable resting habitat for the Aquatic Warbler during spring migration. However, attention must be paid to the presence and maintenance of more open vegetation. Excessive homogenization into continuous reedbeds reduces the abundance of arthropod prey available to the species.



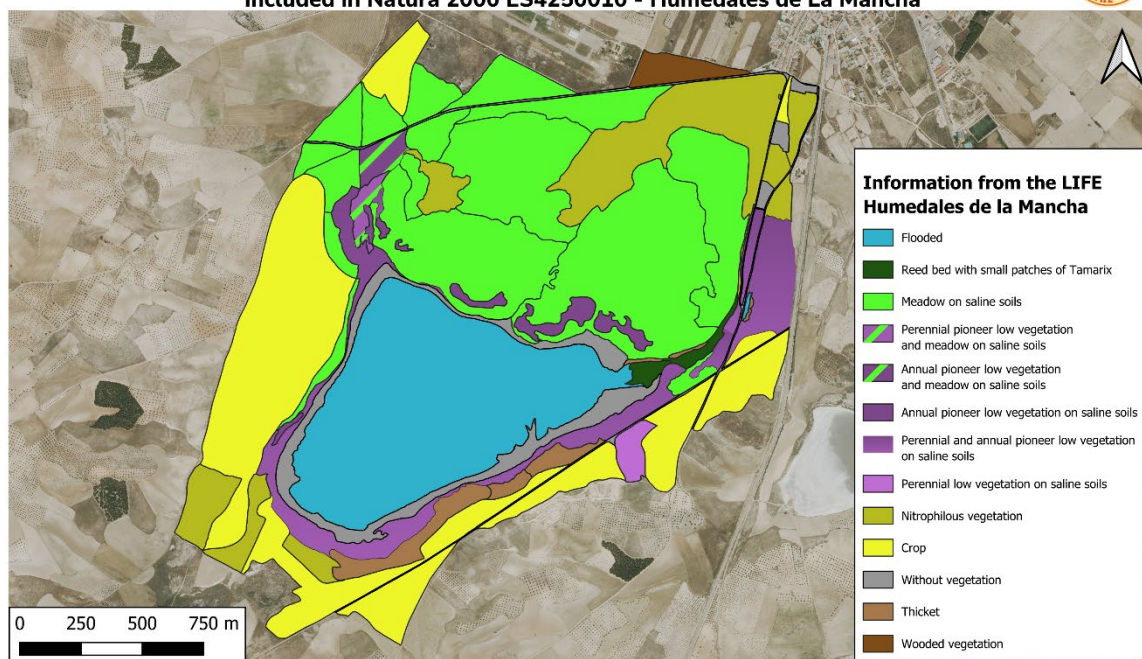
Source : Orthophoto Spain PNOA project



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Figure 19 : Orthophoto view of laguna de El Longar

Habitat mapping at El Longar was carried out using a phytosociological approach, based on information from the LIFE Humedales de la Mancha project. For clarity, some vegetation types were grouped to simplify the map (Figure 20).



Sources :
Orthophoto Spain PNOA project
Fundación Global Nature – LIFE (LIFE Humedales de la Mancha)



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Figure 20 : Habitat mapping of laguna de El Longar

El Longar is primarily characterized by a large open-water body and extensive wet meadows, which account for 18% and 32% of the site, respectively. An area of unvegetated ground surrounds the waterbody, while adjacent areas are covered by pioneer vegetation, including shrubby sea-blite, European seaheath, and coast barbgrass. In the northwestern part of the lagoon, approximately 2.5 hectares are covered by reed beds, interspersed with small patches of *Tamarix*. The remainder of the mapped area is mainly composed of crops and nitrophilous vegetation, representing 20% and 10% of the site, respectively.

The **Table 10** presents the correspondences between the simplified vegetation categories and the phytosociological classification.

Table 10 : Total area of each habitat type identified at Laguna de El Longar

Detailed vegetation	Simplified habitats	Area (hectares)
Flooded	Flooded	75.49
<i>Typho - Schoenoplectetum tabernaemontani</i>	Reed bed with small patches of <i>Tamarix</i>	2.46
<i>Senecioni castellani - Lygeetum sparti</i>	Meadow on saline soils	134.15
<i>Suaedetum braun-blanquetii</i> y <i>Polypogono maritimi - Hordeetum marini</i>	Perennial pioneer low vegetation and meadow on saline soils	1.9
<i>Senecioni castellani - Lygeetum sparti</i> y <i>P. incurvae - F. pulverulentae</i>	Annual pioneer low vegetation and meadow on saline soils	2.63
<i>Microcnemetum coralloidis</i>	Annual pioneer low vegetation on saline soils	5.25
<i>Suaedetum braun-blanquetii</i> y <i>Parapholido incurvae - Frankenietum pulverulentae</i>	Perennial and annual pioneer low vegetation on saline soils	29.1
<i>Suaedetum braun-blanquetii</i>	Perennial low vegetation on saline soils	5.04
Nitrophilous vegetation	Nitrophilous vegetation	42.95
Crop	Crop	85.39
Without vegetation	Without vegetation	21.28
<i>Agrostio stoloniferae - Tamaricetum canariensis</i>	Thicket	8.84
Wooded vegetation	Wooded vegetation	4

5.3.10 Laguna Larga de Villafranca

The laguna Larga de Villafranca is also located in CLM, within the Natura 2000 site ES4250010 “Humedales de La Mancha”. Covering an area more than 250 hectares (**Figure 21**), this shallow wetland generally maintains a permanent water level throughout the year due to inputs of wastewater and treated water.

The mapped area covers 136.76 hectares.



Figure 21 : Orthophoto view of laguna Larga de Villafranca

The laguna Larga was previously surveyed using phytosociology within the framework of the LIFE Humedales de la Mancha project. To facilitate interpretation, vegetation units were grouped into a reduced number of categories (**Figure 22**).

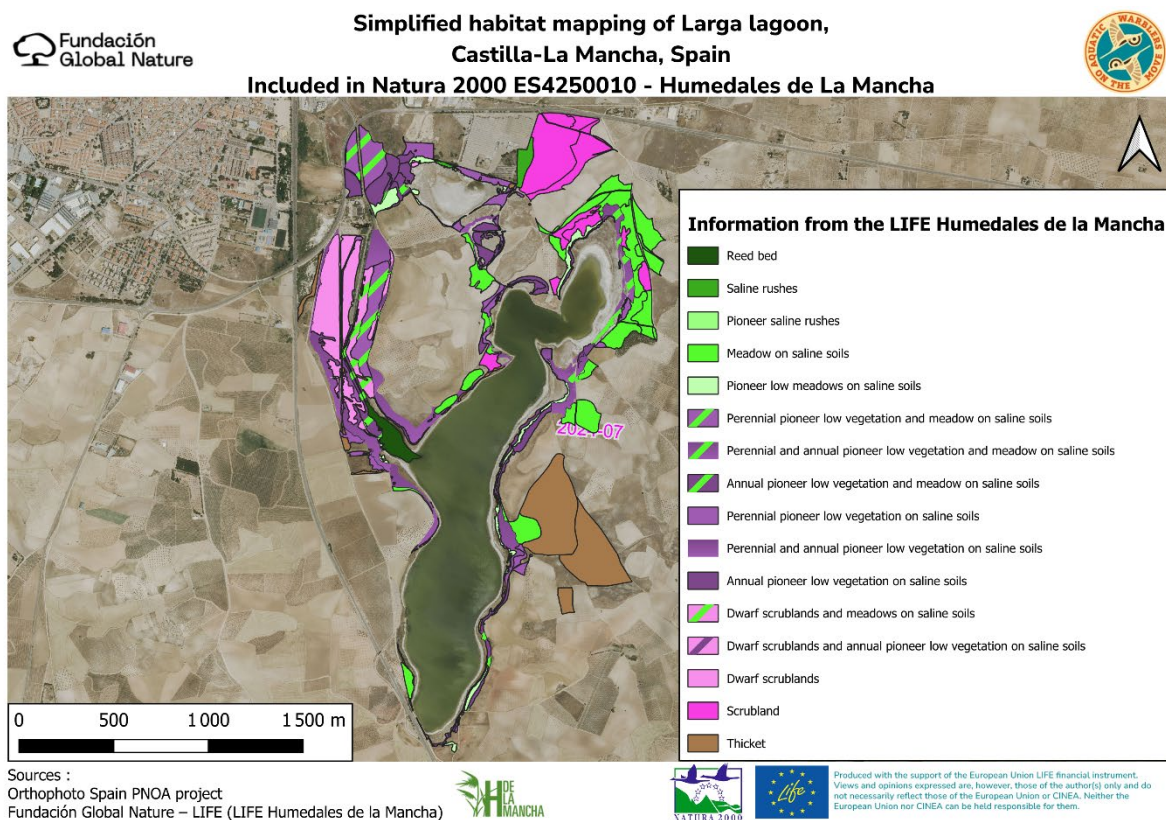


Figure 22 : Habitat mapping of laguna Larga de Villafranca

The correspondence between these categories and the original phytosociological units is presented in (Table 11).

Approximately one quarter of the mapped area is covered by low vegetation, including *Salicornia*, which is mainly distributed around a large body of water (not included in the mapping). Scrubland communities, represented by vegetation associated with saline soils and/or marsh edges, occupy about 21% of the mapped area and are concentrated primarily in the northern sector. Meadows and thickets each account for approximately 16% of the site. In the western part of the wetland, reed beds cover 2.61 hectares, representing around 2% of the mapped area. Most of the remaining area consists of vegetation mosaics combining low vegetation, meadows, and scrublands.

Table 11 : Total area of each habitat type identified at laguna Larga de Villafranca

Detailed vegetation	Area (hectares)	Simplified habitats	Area (hectares)
Reed bed	2.61	Reed bed	2.61
<i>Soncho crassifolii</i> - <i>Juncetum maritimi</i>	1.49	Saline rushes	1.49
<i>Aeluropo littoralis</i> - <i>Juncetum subulati</i>	0.07	Pioneer saline rushes	0.07
<i>Senecioni castellani</i> - <i>Lygeetum sparti</i>	21.63	Meadow on saline soils	21.93
<i>Puccinellietum caespitosae</i> y <i>Polypogono maritimi</i> - <i>Hordeetum marini</i>	0.3		
<i>Puccinellietum caespitosae</i>	4.91	Pioneer low meadows on saline soils	4.91
<i>Suaedetum braun-blauquetii</i> y <i>Polypogono maritimi</i> - <i>Hordeetum marini</i>	8.85	Perennial pioneer low vegetation and meadow on saline soils	9.77
<i>Puccinellietum caespitosae</i> y <i>Cressetum creticae</i>	0.92		
<i>Suaedetum braun-blauquetii</i> , <i>P. incurvae</i> - <i>F. pulverulentae</i> y <i>P. maritimi</i> - <i>H. marini</i>	3.49	Perennial and annual pioneer low vegetation and meadow on saline soils	3.49
<i>P. caespitosae</i> - <i>Suaedo splendentis</i> - <i>Salsoletum sodae</i>	1.06	Annual pioneer low vegetation and meadow on saline soils	3.78
<i>Puccinellietum caespitosae</i> y <i>Parapholido incurvae</i> - <i>Frankenietum pulverulentae</i>	2.72		
<i>Suaedetum braun-blauquetii</i>	7.17	Perennial pioneer low vegetation on saline soils	7.17
<i>Suaedetum braun-blauquetii</i> y <i>Parapholido incurvae</i> - <i>Frankenietum pulverulentae</i>	15.25	Perennial and annual pioneer low vegetation on saline soils	15.25
<i>Suaedo splendentis</i> - <i>Salicornietum patulae</i>	1.13	Annual pioneer low vegetation on saline soils	10.37
<i>Suaedo spicatae</i> - <i>Salicornietum patulae</i>	2.61		
<i>Parapholido incurvae</i> - <i>Frankenietum pulverulentae</i>	5.85		
<i>Suaedo splendentis</i> - <i>Salsoletum sodae</i>	0.57		
<i>Suaedetum spicato-splendentis</i>	0.21		
<i>Sarcocornietum alpini</i> y <i>Polypogono maritimi</i> - <i>Hordeetum marini</i>	2.91	Dwarf scrublands and meadows on saline soils	2.91
<i>Sarcocornietum alpini</i> y <i>Parapholido incurvae</i> - <i>Frankenietum pulverulentae</i>	0.87	Dwarf scrublands and annual pioneer low vegetation on saline soils	0.87
<i>Sarcocornietum alpini</i>	12.27	Dwarf scrublands	12.27
<i>Frankenio thymifoliae</i> - <i>Limonietum latebracteati</i>	12.84	Scrubland	17.09
<i>Artemisio herba-albae</i> - <i>Frankenietum thymifoliae</i>	3.55		

<i>Gypsophilo tomentosae-Limonietum dichotomi</i>	0.7		
<i>Agrostio stoloniferae-Tamaricetum canariensis</i>	22.78	Thicket	22.78

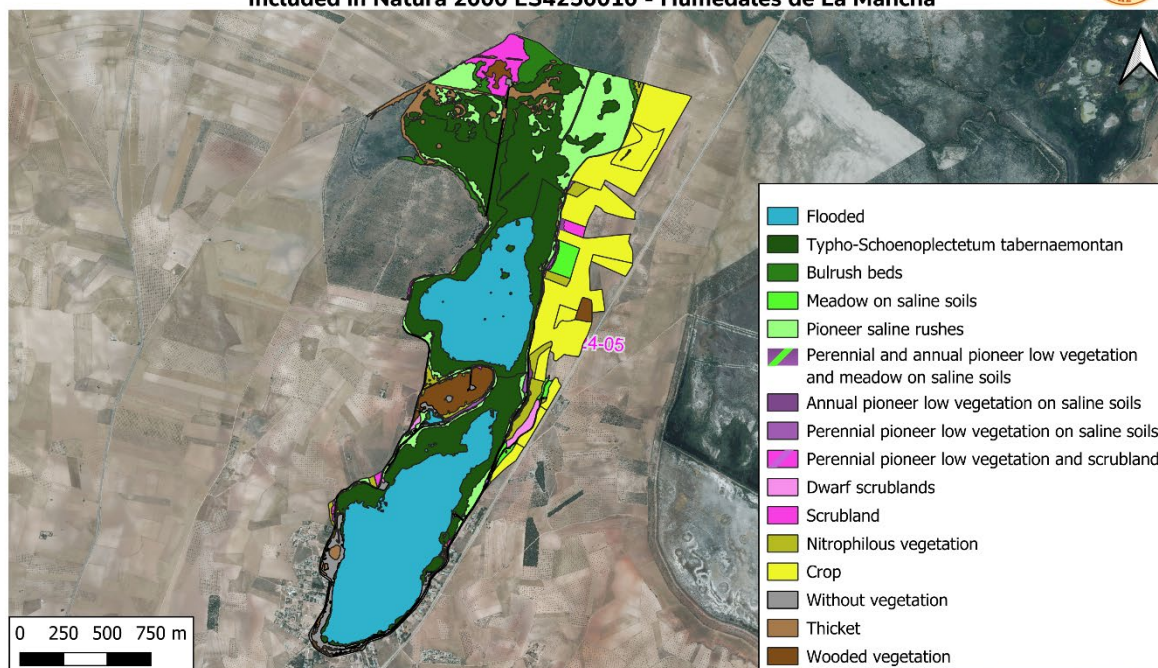
5.3.11 Lagunas Grande y Chica de Villafranca de los Caballeros

Also located in CLM and within the Natura 2000 site ES4250010 “Humedales de la Mancha”, lagunas Grande y Chica cover a total area of 305 hectares (**Figure 23**). This wetland is particularly important for its bird populations. The habitats are especially suitable for the Aquatic Warbler; however, ongoing vegetation overgrowth caused by nutrient-enriched incoming waters, inadequate water-management infrastructure, and the spread of invasive plant species may threaten the conservation of these habitats.



Figure 23 : Orthophoto view of lagunas Grande y Chica

As part of the LIFE Humedales de la Mancha project, lagunas Grande y Chica were mapped using phytosociology. *Typho-Schoenoplectetum tabernaemontani* was the only unit that was not simplified, as its physiognomy varies across the site: some stands dominated by reeds, while others by bulrush. Additional work will be required to refine the mapping and distinguish according to their dominant species. The simplified vegetation map is presented below (**Figure 24**).



Sources :
Orthophoto Spain PNOA project
Fundación Global Nature – LIFE
(LIFE Humedales de la Mancha, LIFE Paludicola & LIFE Wetlands4Climate)



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Figure 24 : Habitat mapping of lagunas Grande y Chica

The correspondance between the simplified categories and the phytosociological units is provided in the following table (Table 12). Open water occupies approximately one quarter of the site. Another quarter is covered by *Typho-Schoenoplectetum tabernaemontani* communities, which are dominated either by *Scirpus* species or by reed beds. Meadows and saline rush communities account for approximately 9% of the area. Cropland covers around 13% of the mapped site, mainly on the eastern side of the wetland. The remaining areas consist of a variety of vegetation types, including low vegetation, scrubland, thickets, and woodland communities.

Table 12 : Total area of each habitat type identified at lagunas Grande y Chica

Detailed vegetations	Area (hectares)	Simplified habitats	Area (hectares)
Flooded	89.54	Flooded	89.54
<i>Typho - Schoenoplectetum tabernaemontani</i>	86.71	<i>Typho - Schoenoplectetum tabernaemontani</i>	86.71
<i>Holoschoenetum vulgaris</i>	6.2	Bulrush beds	6.21
<i>Scirpetum compacto-litoralis</i>	0.01		
<i>Senecioni castellani - Lygeetum sparti</i>	3.19	Meadow on saline soils	3.19
<i>Aeluropo littoralis - Juncetum subulati</i>	29.8	Pioneer saline rushes	29.8
<i>Suaedetum braun-blauquetii</i> , <i>P. incurvae</i> - <i>F. pulverulenta</i> y <i>P. maritimi</i> - <i>H. marini</i>	0.17	Perennial and annual pioneer low vegetation and meadow on saline soils	0.17
<i>Suaedetum spicato-splendens</i>	0.43	Annual pioneer low vegetation on saline soils	0.59
<i>Parapholido incurvae - Frankenietum pulverulenta</i>	0.13		

Detailed vegetations	Area (hectares)	Simplified habitats	Area (hectares)
<i>Suaedo spicatae</i> - <i>Salicornietum patulae</i>	0.02		
<i>Suaedetum braun-blanquetii</i>	1.18	Perennial pioneer low vegetation on saline soils	1.18
<i>S. braun-blanquetii</i> y <i>F. thymifoliae</i> - <i>L. dichotomi</i>	0.17	Perennial pioneer low vegetation and scrubland	0.17
<i>Sarcocornietum alpini</i>	0.36	Dwarf scrublands	1.61
<i>Lino differentis</i> - <i>Salvietum lavandulifoliae</i>	1.25		
<i>Frankenio thymifoliae</i> - <i>Limonietum latebracteati</i>	0.73	Scrubland	6.94
<i>Artemisio herba-albae</i> - <i>Frankenietum thymifoliae</i>	6.21		
Nitrophilous vegetation	6.06	Nitrophilous vegetation	6.06
Crop	46.68	Crop	46.68
Without vegetation	10.19	Without vegetation	10.19
<i>Agrostio stoloniferae</i> - <i>Tamaricetum canariensis</i>	10.89	Thicket	10.89
Wooded vegetation	9.24	Wooded vegetation	9.24

5.3.12 Laguna de Manjavacas

Like the previously described lagoons, laguna de Manjavacas is located in CLM and forms part of the Natura 2000 site ES4250010 “Humedales de la Mancha”. The lagoon covers an area of 536 hectares (**Figure 25**). It is one of the wetlands in the region that supports the largest expanses of halophytic vegetation considered suitable for the Aquatic Warbler.

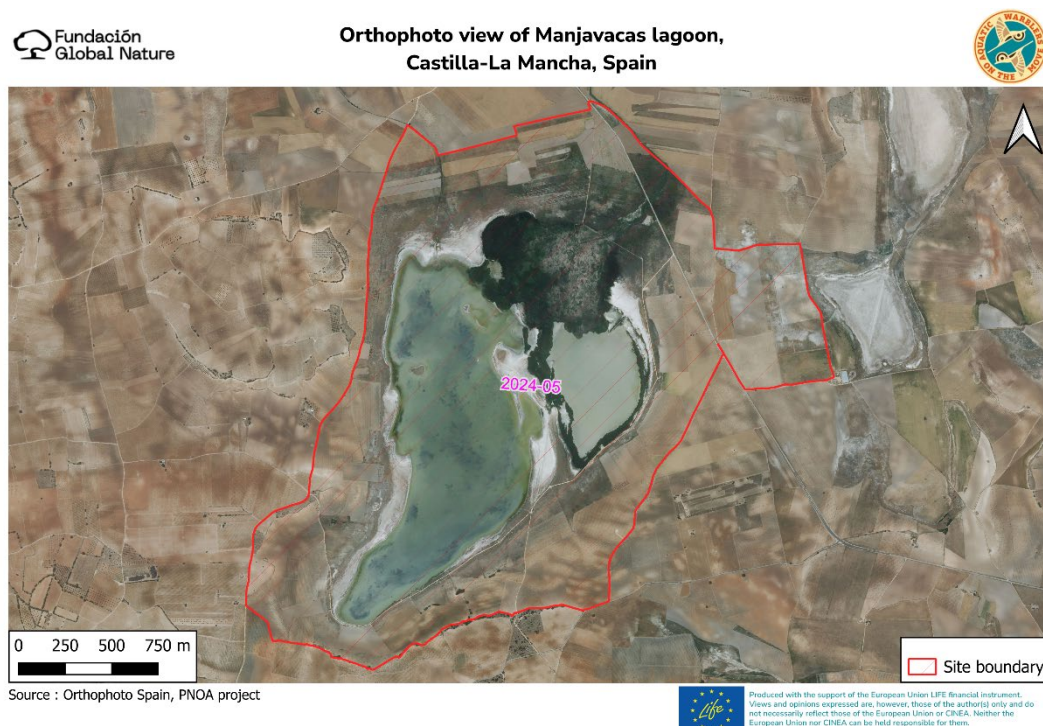


Figure 25 : Orthophoto view of laguna de Manjavacas

Vegetation mapping was carried out within the framework of the LIFE Humedales de la Mancha project using phytosociology. *Typho-Schoenoplectetum tabernaemontani* is the only vegetation association that has not been simplified in the classification. Depending on the location, this association may be dominated either by common reed or by bulrush. Additional fieldwork will therefore be required to refine this information and update the vegetation map according to the dominant species. The simplified vegetation map used in this report is presented below (Figure 26).

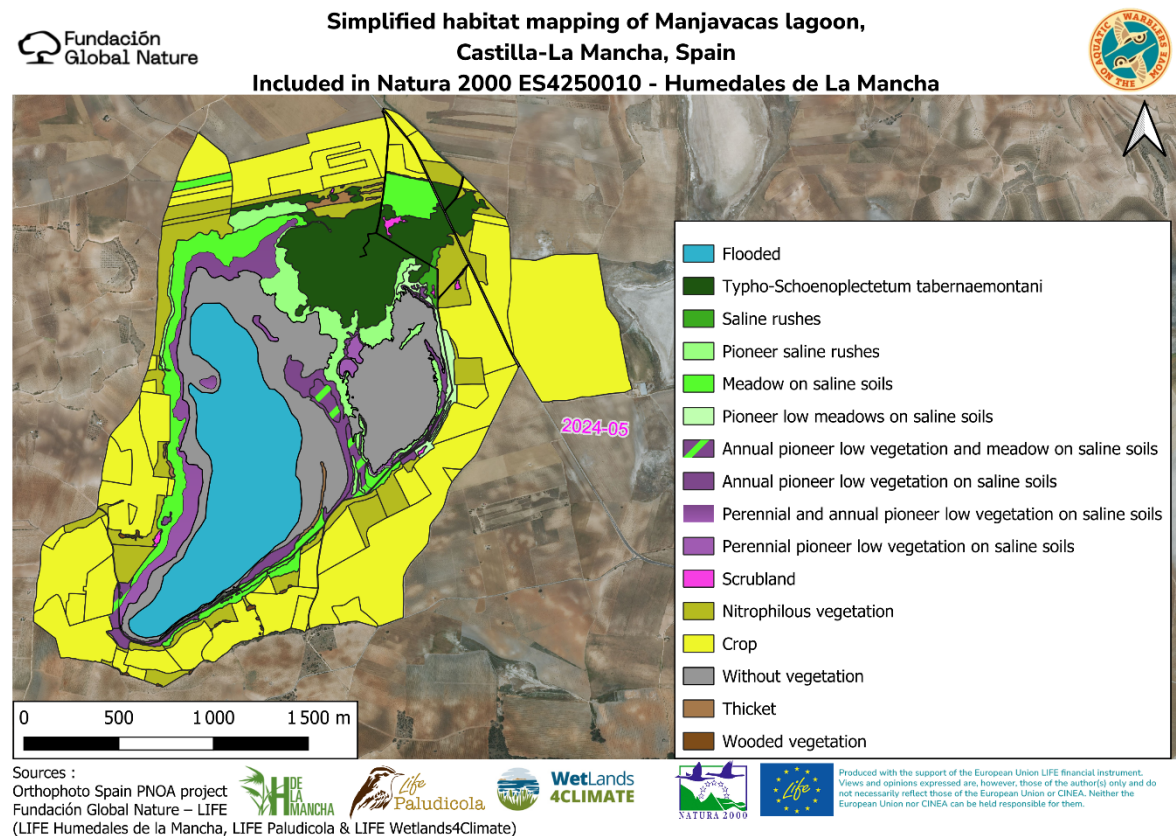


Figure 26 : Habitat mapping of laguna de Manjavacas

The correspondence between the simplified classes and the phytosociological units is provided (Table 13), allowing the vegetation types included within each mapping category to be identified. The main water body of the lagoon and the *Typho-Schoenoplectetum tabernaemontani* association each account for approximately 8% of the site. Areas devoid of vegetation surrounding the water body represent 15% of the site. Meadows and saline rush communities cover 9.5% of the wetland, while low-growing vegetation covers about 5%. Agricultural lands (crops) have been mapped around the wetland, representing nearly 40% of the area.

Table 13 : Total area of each habitat type identified at laguna de Manjavacas

Detailed vegetations	Area (hectares)	Simplified habitats	Area (hectares)
Flooded	69.94	Flooded	69.94
<i>Typho - Schoenoplectetum tabernaemontani</i>	42.06	<i>Typho - Schoenoplectetum tabernaemontani</i>	42.06
<i>Soncho crassifolii - Juncetum maritimi</i>	1.4	Saline rushes	1.4
<i>Aeluropo littoralis - Juncetum subulati</i>	19.71	Pioneer saline rushes	19.71

<i>Polypogono maritimi</i> - <i>Hordeetum marini</i>	7.27	Meadow on saline soils	29.87
<i>Puccinellietum caespitosae</i> y <i>Polypogono maritimi</i> - <i>Hordeetum marini</i>	22.6		
<i>Puccinellietum caespitosae</i>	4.36	Pioneer low meadows on saline soils	4.36
<i>P. caespitosae</i> , <i>P. maritimi</i> - <i>Hordeetum marini</i> y <i>S. splendentis</i> - <i>S. sodae</i>	0.73	Annual pioneer low vegetation and meadow on saline soils	6.1
<i>P. incurvae</i> - <i>F. pulverulentae</i> , <i>P. maritimi</i> - <i>H. marini</i> y <i>S. splendentis</i> - <i>S. sodae</i>	0.47		
<i>Parapholido incurvae</i> - <i>Frankenietum pulverulentae</i> y <i>P. - Hordeetum marini</i>	0.2		
<i>Puccinellietum caespitosae</i> y <i>Parapholido incurvae</i> - <i>Frankenietum pulverulentae</i>	0.18		
<i>Puccinellietum caespitosae</i> y <i>S. splendentis</i> - <i>S. sodae</i>	0.91		
<i>Puccinellietum caespitosae</i> , <i>P. incurvae</i> - <i>F. pulverulentae</i> y <i>P. maritimi</i> - <i>H. marini</i>	1.71		
<i>S. splendentis</i> - <i>S. patulae</i> , <i>P. caespitosae</i> y <i>P. incurvae</i> - <i>F. pulverulentae</i>	1.9	Annual pioneer low vegetation on saline soils	10.2
<i>Parapholido incurvae</i> - <i>Frankenietum pulverulentae</i>	0.26		
<i>S. splendentis</i> - <i>S. patulae</i> , <i>C. creticae</i> y <i>P. incurvae</i> - <i>F. pulverulentae</i>	0.44		
<i>S. splendentis</i> - <i>S.</i> , <i>Cressetum creticae</i> y <i>S. splendentis</i> - <i>S. sodae</i>	0.71		
<i>Suaedo splendentis</i> - <i>Salicornietum patulae</i>	7.06		
<i>Suaedo splendentis</i> - <i>Salsoletum sodae</i>	1.73	Perennial and annual pioneer low vegetation on saline soils	16.12
<i>Suaedo splendentis</i> - <i>Salicornietum patulae</i> y <i>Cressetum creticae</i>	16.12		
<i>Cressetum creticae</i>	1.57	Perennial pioneer low vegetation on saline soils	1.6
<i>Suaedetum braun-blauquetii</i>	0.03		
<i>Gypsophilo tomentosae</i> - <i>Limonietum dichotomi</i>	0.97	Scrubland	1.04
<i>Gypsophilo tomentosae</i> - <i>Limonietum dichotomi</i> y <i>M. coralloidis</i>	0.07		
Nitrophilous vegetation	47.27	Nitrophilous vegetation	47.27
Crop	210.68	Crop	210.68
Without vegetation	80.06	Without vegetation	80.06
<i>Agrostio stoloniferae</i> - <i>Tamaricetum canariensis</i>	2.09	Thicket	2.09
Wooded vegetation	0.57	Wooded vegetation	0.57

5.3.13 Laguna de La Nava

Laguna de la Nava is located in CYL, north-western Spain, and is included within the Natura 2000 site ES4140036 “La Nava-Campos Norte”. The wetland covers an area of 430 hectares (**Figure 27**). It is one of the most important wetlands for the Aquatic Warbler during both spring and autumn migration. In addition, it serves as a nationally important bird-ringing station, with annual Aquatic

Warbler monitoring campaigns conducted since 1999.

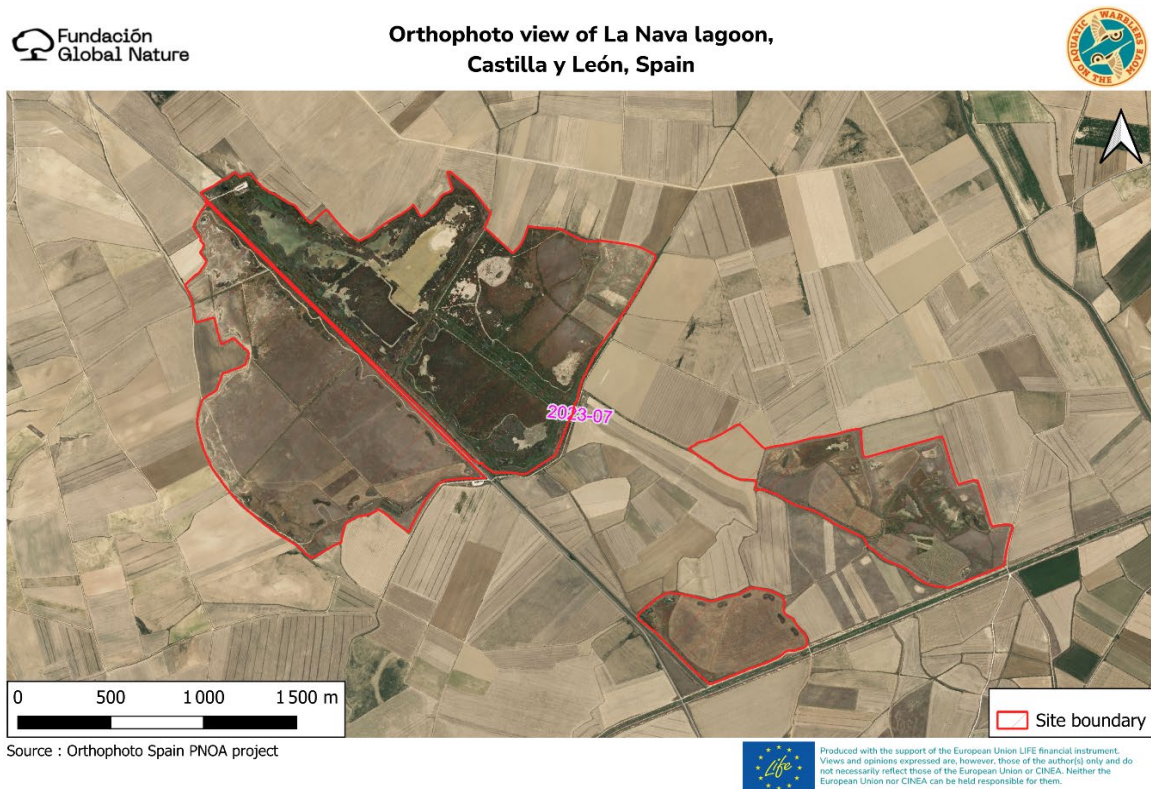


Figure 27 : Orthophoto view of laguna de La Nava

Vegetation mapping of La Nava was undertaken as part of the LIFE Paludicola project using a simplified habitat typology based on broad vegetation categories (**Figure 28**).

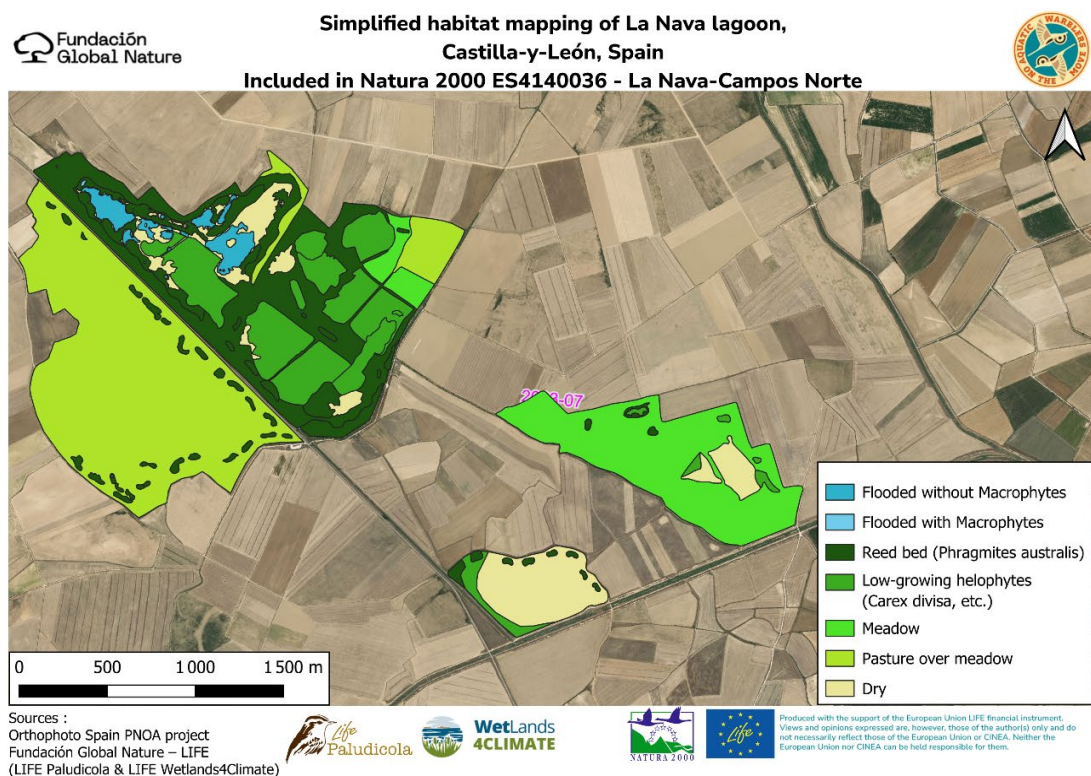


Figure 28 : Habitat mapping of laguna de La Nava

Based on such classification, pasture over meadows represent slightly more than one-third of the site (**Table 14**). Reed beds, meadows and low-growing helophytes also occupy substantial areas, accounting for 21%, 17% and 15% of the site, respectively.

Table 14 : Total area of each habitat type identified at laguna de La Nava

Habitats	Area (hectares)
Flooded without Macrophytes	10.22
Flooded with Macrophytes	0.24
Reed bed (<i>Phragmites australis</i>)	90.16
Low-growing helophytes (<i>Carex divisa</i> , etc.)	64.2
Meadow	71.62
Pasture over meadow	148.66
Dry	45.33

5.3.14 Charcas del Cruce

Charcas del Cruce is also located in CYL, in north-western Spain. The site is included within the Natura 2000 site ES4140036 “La Nava-Campos Norte” and is situated adjacent to the Canal de Castilla. Covering approximately 12 hectares, (**Figure 29**), this wetland forms part of an ecological corridor together with nearby wetlands, including Laguna de la Nava, providing connectivity for marshland species like the Aquatic Warbler. The main challenge at Charcas del Cruce is the limited availability of water resulting from inadequate water management. LIFE AWOM will therefore focus on restoring the wetland’s flooding capacity through the implementation of water-management infrastructure. In addition, the construction of vegetation barriers will reduce disturbance caused by heavy traffic in the area and minimize non-natural bird mortality.

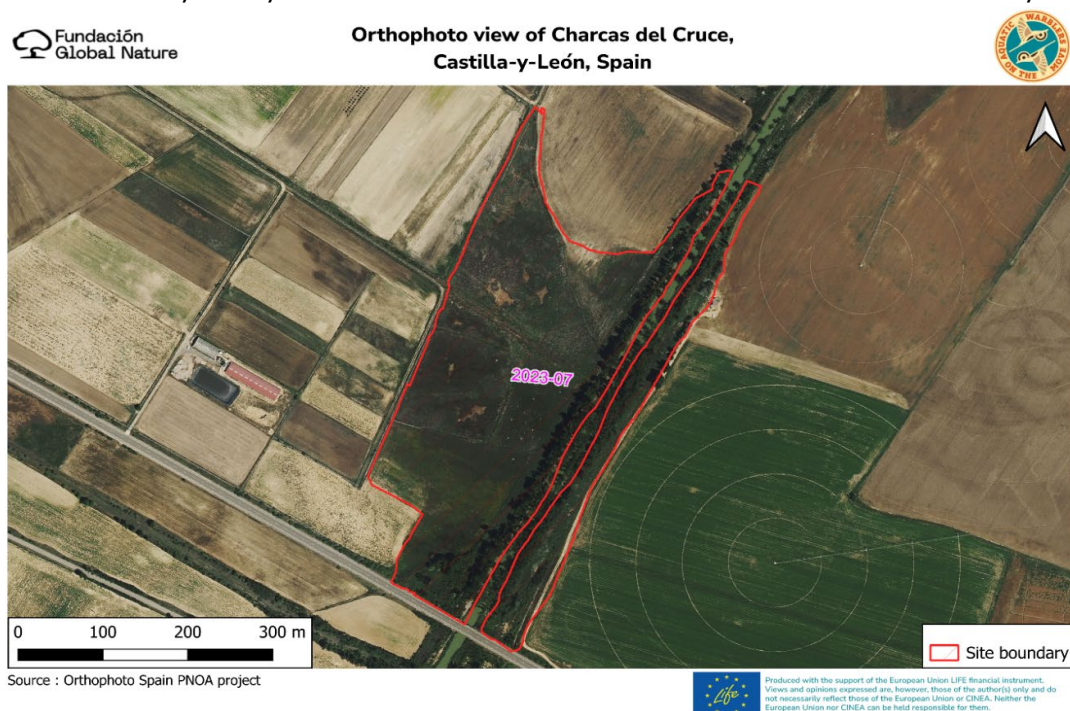


Figure 29 : Orthophoto view of Charcas del Cruce

Three main habitat types have been identified at the site: reed beds, *Bolboschoenus* and *Juncus* beds, and wooded vegetation (Figure 30).

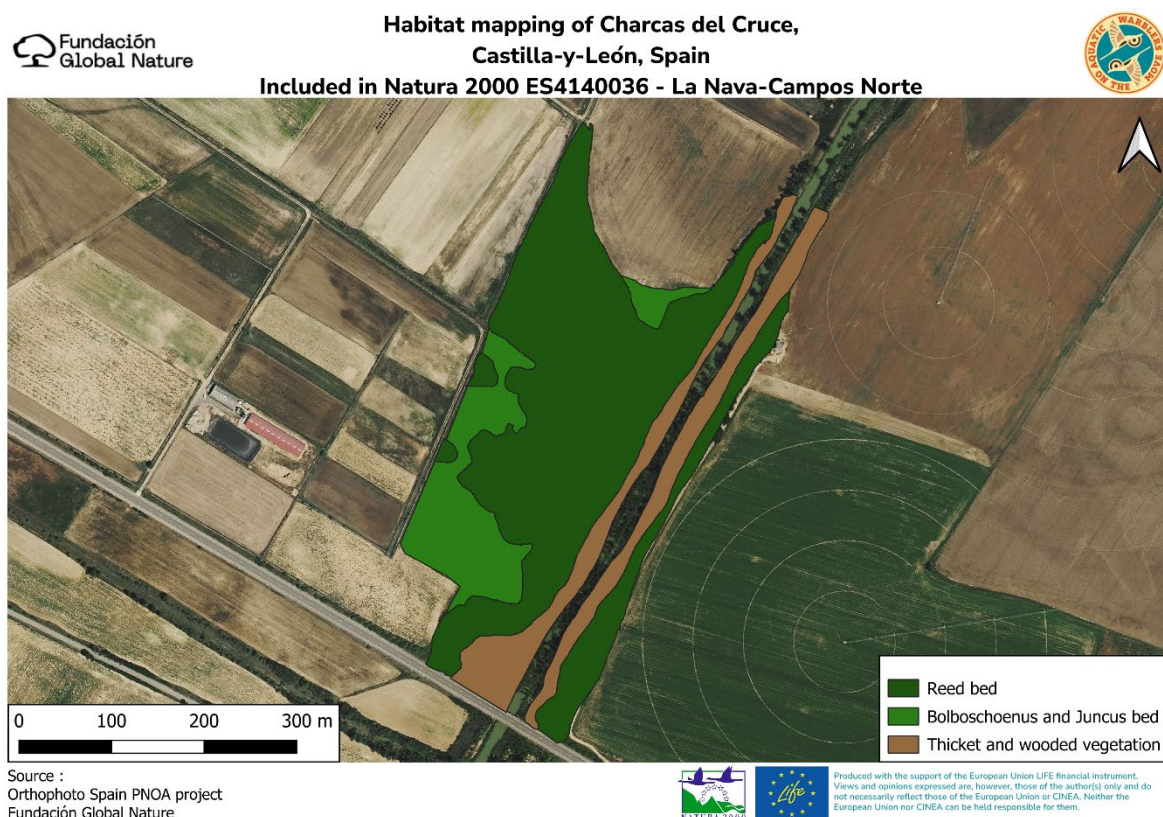


Figure 30 : Habitat mapping of Charcas del Cruce

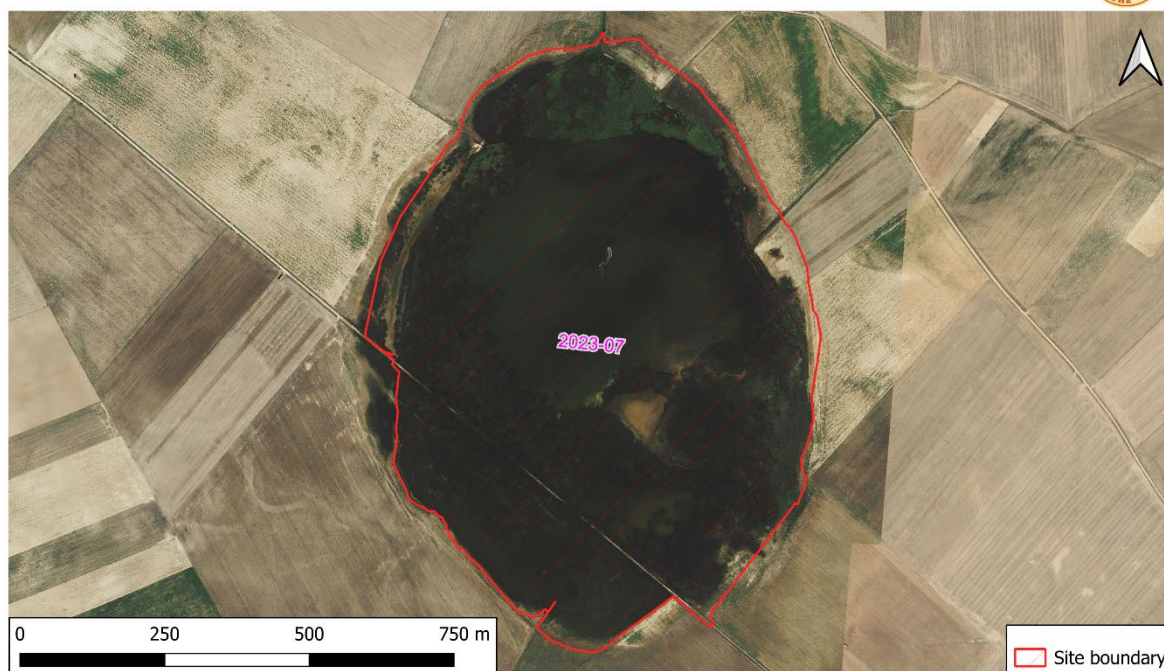
Reed beds dominate the wetland, covering approximately two-thirds of the site and forming a mosaic with smaller patches of *Bolboschoenus* and *Juncus* beds. Linear thicket and wooded vegetation are also present along both banks of the Canal de Castilla.

Table 15 : Total area of each habitat type identified at Charcas del Cruce

Habitats	Area (hectares)
Reed bed	8.04
<i>Bolboschoenus</i> and <i>Juncus</i> bed	1.94
Thicket and wooded vegetation	2.33

5.3.15 Laguna de Boada

Laguna de Boada is a steppe wetland located in CYL and included within the Natura 2000 site ES0000216 “La Nava-Campos Sur”. Boada covers approximately 60 hectares (Figure 31) and has a maximum water depth of around 60cm. Historically, the wetland extended over an area of 90 hectares but was completely drained. Today, much of its water supply comes from the Canal de Castilla, enabling the development and maintenance of habitats of community interest. Boada is currently one of the most important stopover sites for the Aquatic Warbler in CYL during autumn migration.



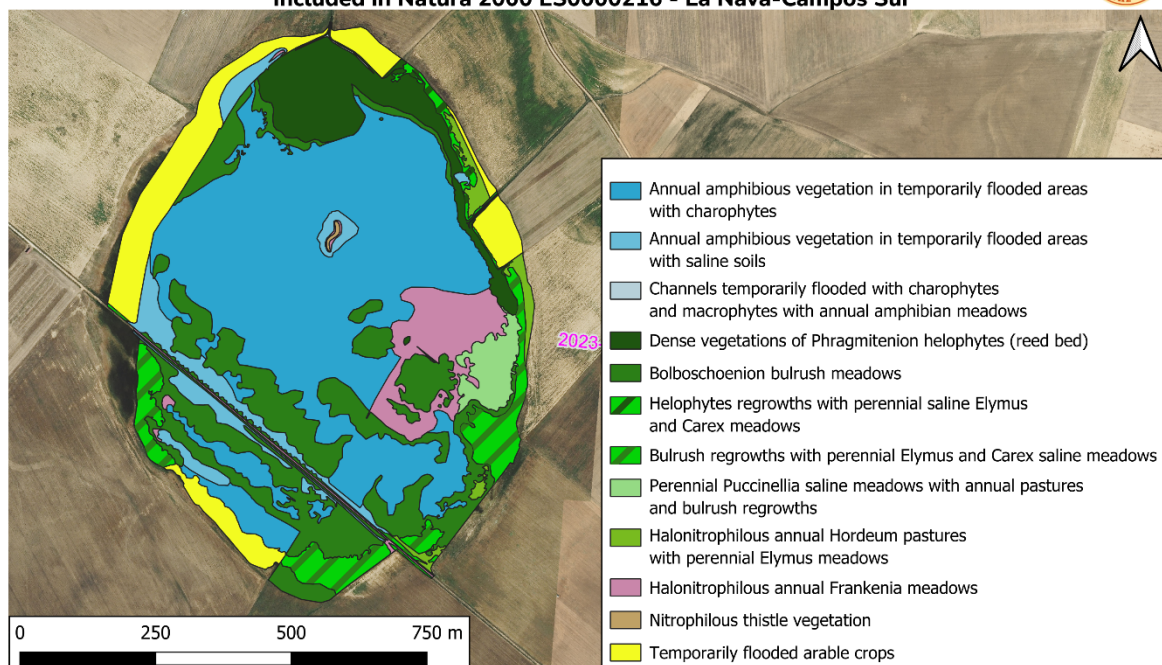
Source : Orthophoto Spain PNOA project



Produced with the support of the European Union LIFE financial instrument. Views and opinions expressed are, however, those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor CINEA can be held responsible for them.

Figure 31 : Orthophoto view of laguna de Boada

Habitat mapping was carried out within the framework of the LIFE Paludicola project (Figure 32).



Sources :
Orthophoto Spain PNOA project
Fundación Global Nature – LIFE
(LIFE Paludicola & LIFE Wetlands4Climate)



Produced with the support of the European Union LIFE financial instrument. Views and opinions expressed are, however, those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor CINEA can be held responsible for them.

Figure 32 : Habitat mapping of laguna de Boada

A total of 12 habitat types were identified across the site (**Table 16**). Flooded vegetation is the dominant habitat, covering nearly half of the wetland. Bulrush meadows and reed beds account for approximately 20% and 7% of the site, respectively. Other areas are occupied by mosaics of wetlands vegetation, nitrophilous plant communities, and agricultural lands (crops).

Table 16 : Total area of each habitat type identified at laguna de Boada

Habitats	Area (hectares)
Annual amphibious vegetation in temporarily flooded areas with charophytes	25.01
Annual amphibious vegetation in temporarily flooded areas with saline soils	3.14
Channels temporarily flooded with charophytes and macrophytes with annual amphibian meadows	0.05
Dense vegetations of <i>Phragmites</i> helophytes (reed bed)	4.5
<i>Bolboschoenion</i> bulrush meadows	12.18
Helophytes regrowths with perennial saline <i>Elymus</i> and <i>Carex</i> meadows	0.42
Bulrush regrowths with perennial <i>Elymus</i> and <i>Carex</i> saline meadows	3.43
Perennial <i>Puccinellia</i> saline meadows with annual pastures and bulrush regrowths	1.26
Halonitrophilous annual <i>Hordeum</i> pastures with perennial <i>Elymus</i> meadows	0.86
Halonitrophilous annual <i>Frankenia</i> meadows	3.41
Nitrophilous thistle vegetation	0.04
Temporarily flooded arable crops	5.31

5.3.16 Laguna de Pedraza

Like the three previously described wetlands, laguna de Pedraza is located in CYL and forms part of the Natura 2000 site ES0000216 “La Nava-Campos Sur”. Covering approximately 75 hectares (**Figure 33**), it is a steppe wetland similar to Boada. Laguna de Pedraza has an average water depth of 20-30cm, reaching a maximum depth of approximately 50cm, except within the central drainage channel. After completely drying up in the 1970s, restoration efforts began in 2004, and the wetland’s flooding regime was successfully re-established in 2008.

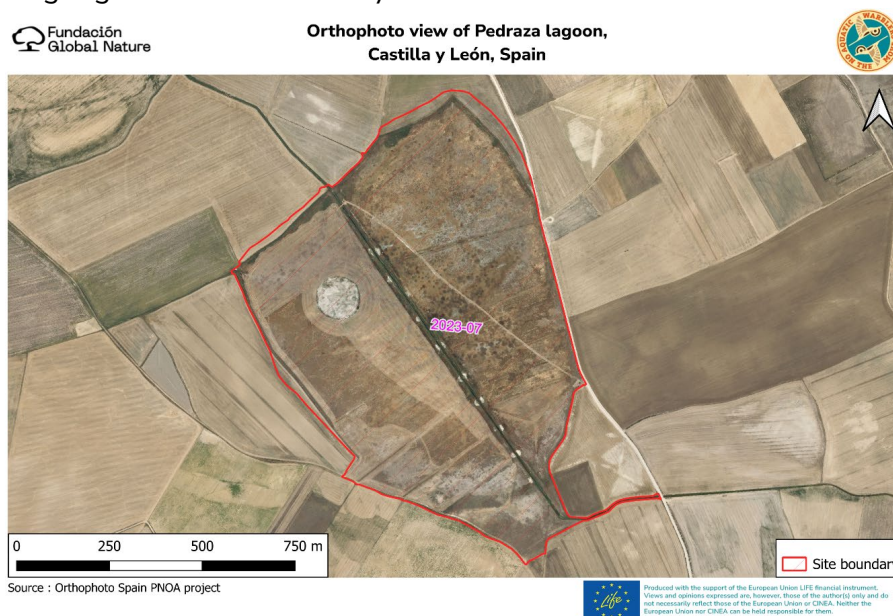


Figure 33 : Orthophoto view of laguna de Pedraza

Habitat mapping presented below is based on information collected from the LIFE Paludicola project (Figure 34).

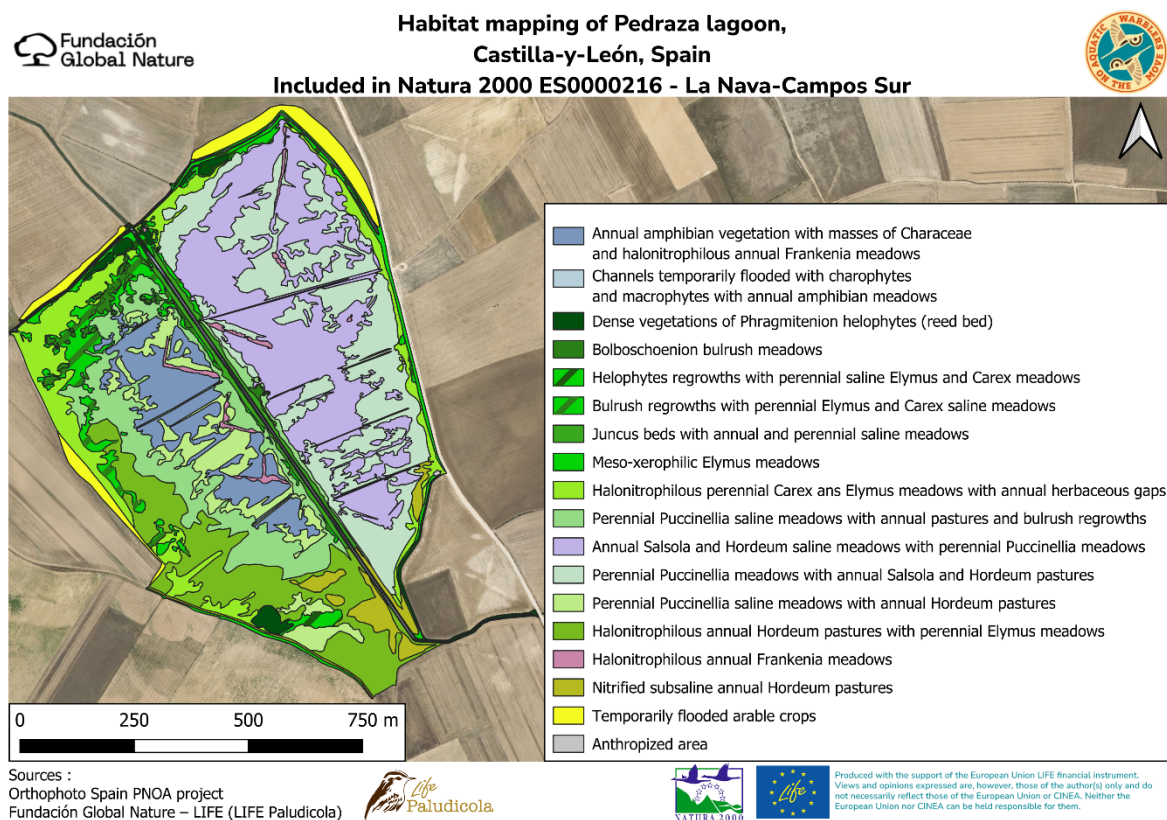


Figure 34 : Habitat mapping of laguna de Pedraza

A total of 18 habitat types have been identified within the site (Table 17). The wetland is predominantly covered by Puccinellia meadows associated with Hordeum and Salsola communities, as well as meadows mixed with bulrush vegetation, together accounting for approximately 40% of the site. Communities dominated by Hordeum and Elymus represent a further 26% of the wetland and typically occur in mosaic with bulrush, helophytes, and herbaceous patches.

Table 17 : Total area of each habitat type identified at laguna de Pedraza

Habitats	Area (hectares)
Annual amphibian vegetation with masses of <i>Characeae</i> and halonitrophilous annual <i>Frankenia</i> meadows	5.51
Channels temporarily flooded with charophytes and macrophytes with annual amphibian meadows	0.66
Dense vegetations of <i>Phragmites</i> helophytes (reed bed)	1.66
<i>Bolboschoenion</i> bulrush meadows	0.58
Helophytes regrowths with perennial saline <i>Elymus</i> and <i>Carex</i> meadows	1.71
Bulrush regrowths with perennial <i>Elymus</i> and <i>Carex</i> saline meadows	2.99
<i>Juncus</i> beds with annual and perennial saline meadows	1.27
Meso-xerophilic <i>Elymus</i> meadows	0.91
Halonitrophilous perennial <i>Carex</i> and <i>Elymus</i> meadows with annual herbaceous gaps	5.93
Perennial <i>Puccinellia</i> saline meadows with annual pastures and bulrush regrowths	7.45
Annual <i>Salsola</i> and <i>Hordeum</i> saline meadows with perennial <i>Puccinellia</i> meadows	15.3
Perennial <i>Puccinellia</i> meadows with annual <i>Salsola</i> and <i>Hordeum</i> pastures	13.44

Perennial <i>Puccinellia</i> saline meadows with annual <i>Hordeum</i> pastures	4.38
Halonitrophilous annual <i>Hordeum</i> pastures with perennial <i>Elymus</i> meadows	8.07
Halonitrophilous annual <i>Frankenia</i> meadows	0.6
Nitrified subsaline annual <i>Hordeum</i> pastures	1.89
Temporarily flooded arable crops	2.49
Anthropized area	0.01

5.4 Portugal

Within the LIFE AWOM, **3 sites** will be restored in Portugal, all of which are located within Natura 2000 sites. Restoration activities at these wetlands will be carried out by the **Sociedade Portuguesa para o Estudo das Aves (SPEA)**.

5.4.1 Lagoa de Santo André

The Santo André lagoon, located in southern Portugal, forms part of the Natura 2000 site PTZPE0013 “Lagoa de Santo André”. Covering 2,164.54 hectares and managed by the Instituto da Conservação da Natureza e das Florestas (ICNF), this wetland is suspected to be one of the most important stopover sites for the Aquatic Warbler in Portugal.

Following discussions with ICNF, habitat mapping for Santo André is expected to be available in November 2025. A restoration plan will also be submitted to the national nature authorities within the same timeframe, after which restoration work will be scheduled. The corresponding data will be added to this document once available.

5.4.2 Lagoa Pequena

The Pequena lagoon, located south of Lisbon, is part of the larger *Albufeira* coastal lagoon system and lies within the Natura 2000 site PTCON0054 “Fernão Ferro / Lagoa de Albufeira”. The lagoon covers 68.77 hectares and consists of a man-made freshwater lagoon and a natural seawater lagoon. The Aquatic Warbler has been recorded here, but restoration actions are required to improve habitat suitability.

Following discussions with ICNF, habitat mapping for Laguna Pequena is expected to be available in November 2025. A restoration plan will also be submitted to the national nature authorities within the same timeframe, after which restoration work will be scheduled. The corresponding data will be added to this document once available.

5.4.3 Ria de Aveiro

The Ria de Aveiro, located in the northern Portugal, is part of the Natura 2000 site PTZPE0004 “Ria de Aveiro”. With an area of 51,407 hectares, it is one of Portugal’s most significant wetlands and the most important stopover known stopover site for the Aquatic Warbler. The project area consists mainly of marshland and abandoned rice fields.

Following discussions with ICNF, habitat mapping for Ria de Aveiro is expected to be available in November 2025. A restoration plan will also be submitted to the national nature authorities within the same timeframe, after which restoration work will be scheduled. The corresponding data will be added to this document once available.

5.5 Senegal

Senegal hosts **one site** to be restored within the LIFE AWOM project: Djoudj National Park. Activities on this site will be carried out by Wetlands International Afrique - Côte Occidentale et Golfe de Guinée (WIACO).

5.5.1 Vicinity of the Djoudj National Park

Djoudj National Park, located near Saint-Louis in northern Senegal, covers 160 km² and contains a wide variety of wetland habitats. It is internationally recognised as a major wintering area for the Aquatic Warbler and other migratory birds.

Habitat data for the Djoudj National Park has already been collected. WIACO is currently working with GIS (geographic information system) tools to finalize the mapping. Drone imagery has been acquired, but additional software is required to process the data; funding is being sought to obtain the necessary license. The finalised mapping will be added to this document once available.

6. Conclusion and further additions

The baseline habitat mapping presented in this document ensures that each AWOM site has an initial habitat map available prior to the start of restoration activities. All sites in **Belgium** and **France** were successfully mapped before the submission of this report.

In **Spain**, habitat mapping has been completed for **13 sites**, while **3 sites** remain unmapped. In the *Aiguamolls de l'Empordà Natural Park*, ongoing discussions concern a potential relocation of the project site due to repeated droughts in recent years. At *Desembocadura del Río Mijares* and *Nules marsh*, habitat mapping has not yet been completed; however, this does not affect the restoration schedule, as work initially planned for September and October 2025 has been postponed. Spanish partners are fully aware that mapping must be completed before initiating restoration work.

The **3 Portuguese sites** also remain unmapped. Habitat information is expected to be available by November 2025, with restoration plans to be submitted to national nature authorities within the same timeframe.

For the *Djoudj National Park* in **Senegal**, habitat information has been collected and is currently being processed. Additional data will be incorporated into the baseline mapping as it becomes available.

In parallel, work will be carried out to compile precise boundaries of the restoration areas for all sites. This will enable a more accurate before-and-after comparison, focusing on habitat and vegetation changes within the zones directly affected by restoration actions.

Annexes

Annex 1 : French ACROLA typology

FUNCTIONAL HABITATS TYPOLOGY (SPECIES HABITATS)			
Habitat code	Typology of vegetations used by the Aquatic Warbler	Generic habitats	Dominant species
A	High reedbeds, thick litter, height > 1,5 m	<i>Phragmites</i> beds, <i>Cladium</i> beds, turficole reedbeds, <i>Aster</i> and <i>Phragmites</i> beds	Common reed, swamp sawgrass
B	Hemming wet meadows and <i>Cladium</i> beds, transitional facies towards reedbeds. Low reedbeds, mixed ¹ . (temporary flooding + density and height heterogeneity alternating vegetation between 0,5 and 1,5 m in August-September)	Parvo-reedbeds, magno-sedge beds hemmed by reeds, low <i>Aster</i> and <i>Phragmites</i> beds	Common reed, reed canary grass, great manna grass, rushes, clubrushes, true sedges
C	Meadows and hygrophilous <i>Cladium</i> beds, without reeds ² with temporary flooding (vegetation height 0,5-1 m in August-September). Meadows and peaty <i>Cladium</i> beds without reeds with permanent flooding + substantial surface area of clubrushes beds, <i>Phalaris</i> beds and <i>Glyceria</i> beds	Sedge beds, <i>Scirpus</i> beds, <i>Juncus</i> beds, subhalophilic meadows, magno-sedge beds, peaty sedge beds	Grasses in mixture with rushes, clubrushes, true sedges
D	Mesohydric meadows without reeds (vegetation height 0,5-1 m in August-September). Polderian meadows. (Oligohaline to mild meadows)	Natural mesohydric meadows	Quack grasses, fescues, small grasses
Cp or Dp	(= Potential C or D) Mat-like meadows or tufted structure in August, due to mowing and/or grazing (possible ecological restoration towards C or D)	Mowed, grazed or over-trampled meadows, field entry, pasture quagmire...	
S1	Halophilic to subhalophilic pioneer perennial vegetations with wheatgrass (high and mid saltmarshes)	<i>Agropyron</i> beds, <i>Elymus</i> beds	Couch grass (<i>Elytrigia acuta</i>)
S2	Low saltmarshes halophilic vegetations, or low subhalophilic vegetations (<0,5 m)	<i>Puccinellia</i> beds, sea purslane beds, sea plantain and common sea-lavender meadows	Seaside alkali grass, sea purslane, sea-lavender
I	Tall-herb communities (reed facies included)	High helophytes	
E	Open water		
V1	Heavily cordgrass-colonized mudflats	<i>Spartina</i> beds	<i>Spartina</i> spp.
V2	Bare mudflats or very scattered vegetation	<i>Salicornia</i> vegetations	<i>Spartina</i> spp., <i>Salicornia</i> spp.
F	Thickets, hedges, shrubs, willow groves, poplar groves and other groves, Pteridium vegetations, woodlands		Woody species
G	Dune grasslands, low vegetation cover or low vegetations	Grey dune, strandline	Bogrushes, <i>Potentilla anserina</i> grasslands
G2	Hygrophilic or hydrophilic vegetations, non halophilic, with low cover or very low height (<0,5 m)	Unflooded mudflat vegetations, peat or parapeat amphibious grasslands, Healing peaty soil vegetation, watercress vegetations	
H	Wooded reedbeds (encroachment by willow shrubs / trees) (possible ecological restoration towards A)		
J	Gardens, ruderal, nitrophilous vegetations		
K	Crops		
L	Dunes with marram grass, vegetated dune	Embryo dune, white dune	
Ch	Paths		
Z	Buildings, industrial areas		

¹ mixed = reeds cover above 1 (Braun-Blanquet)

² without reeds = reeds cover below 1 (Braun-Blanquet)

Vegetation cover according to Braun-Blanquet et al, 1952	
Recovery coefficient	Corresponding %
5	> 75
4	50 - 75
3	25 - 50
2	10 - 25
1	< 10
*	Sole individual