

SCIENTIFIC DESCRIPTION

REPORT

Pilot areas name: Northern Lagoon of Venice, Marano Lagoon, Po delta, Ofanto Estuary, Palud Ornithological Reserve, Neretva River delta, Kolansko Blato coastal lake, Saline wetland

Partners' Name: PP IUAV, PP2 CRF, PP3 CBPF, PP4 ANBO, PP5 NH, PP6 PI DNC, PP7 AGGRA, PP8 NPB

Deliverable 1.2.3 - English summary

date: 31/03/2026

Notes:

This template is inspired by and coordinated with the documentation elaborated in the Interreg Med (2014-2020) WETNET project and the Interreg Italy-Croatia (2014-2020) CREW project.

This report provides a comprehensive scientific overview of the eight pilot wetlands involved in the GREW project, establishing a shared knowledge base to support governance processes and the implementation of Wetland Contracts.

The analysis highlights a generally high level of scientific knowledge across pilot areas, particularly with regard to hydro-geological systems, vegetation patterns, and faunistic resources. Most sites benefit from extensive datasets, monitoring systems, and mapping tools, often developed within the framework of Natura 2000, national environmental plans, and previous EU-funded projects. This ensures a solid baseline for understanding ecosystem dynamics and informing management strategies.

However, the level of detail and spatial coverage of available data varies across thematic domains and pilot areas. While aquatic ecosystems (e.g. hydrodynamics, water quality, and submerged vegetation) are typically well-documented, terrestrial and transitional components (e.g. halophytic vegetation, landscape evolution) are sometimes less systematically monitored. Similarly, although biodiversity data—especially for avifauna—are generally robust, certain taxa remain underrepresented.

Climate change (CC) emerges as a key pressure across all pilot areas, with commonly identified drivers including sea level rise, increasing temperatures, storm surges, altered precipitation patterns, and salinisation processes. The associated impacts—such as habitat loss, ecosystem degradation, biodiversity changes, and increased flood risk—are widely recognised. Nevertheless, the report highlights that the identification and implementation of specific adaptation measures remain uneven. In several cases, adaptation is acknowledged but not yet fully operationalised within management frameworks.

All pilot wetlands demonstrate significant environmental, cultural, and socio-economic value. They are characterised by a strong interconnection between natural dynamics and long-term human activities, resulting in complex socio-ecological systems. This is particularly evident in coastal lagoons and delta areas, where biodiversity conservation, traditional practices, and economic uses coexist within fragile environmental balances.

At the same time, the analysis identifies a set of recurring threats affecting biodiversity and ecosystem functioning, including land use changes, pollution, infrastructure development, human disturbance, and invasive species, often exacerbated by climate change. These pressures underline the need for integrated and adaptive management approaches.

In this context, the report confirms the relevance of Wetland Contracts as participatory governance tools capable of bridging scientific knowledge and decision-making. By building on existing data and addressing current gaps—particularly in relation to climate change adaptation, stakeholder engagement, and cross-sectoral integration—the scientific baseline provided by this deliverable supports the development of coordinated, evidence-based strategies across pilot areas.

Overall, the report contributes to strengthening the knowledge dimension of the GREW project, enabling partners to align their actions, enhance comparability among pilot sites, and improve the effectiveness and transferability of project results.

SCIENTIFIC DESCRIPTION REPORT

Pilot area name: Northern Lagoon of Venice

Partner Name: Iuav University of Venice

Deliverable 1.2.3 - English summary

date: 31/08/2025

Notes:

This template is inspired by and coordinated with the documentation elaborated in the Interreg Med (2014-2020) WETNET project and the Interreg Italy-Croatia (2014-2020) CREW project.

Authors:

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Notes:

1) please respect the maximum number of characters for each chapter, in order to ensure the homogeneity of the partners' contributions.

Chapter number and name		Contents					
A.1	Pilot wetland ID	Name of the pilot wetland				Northern Lagoon of Venice	
		Country				Italy	
		Region/s				Veneto	
		Municipality/ies (*)		Number of inhabitants**			
		Venice				249.658	
		Quarto d'Altino				8.022	
		Musile di Piave				11.464	
		Jesolo				27.006	
		Cavallino Treporti				13.155	
		Total				309.305	
		(*) just those one that include (part of) the protected wetland. Please add as many rows you need.					
		**Istat, October 2024					
		Organization/s responsible for the management of the pilot wetland		Comune di Venezia			
				Public body	X	Private	
		Other entities (Administrations, NGO, etc.) directly involved in the management of the pilot wetland *		Città Metropolitana di Venezia			
		Unesco					
		Provveditorato alle Opere Pubbliche					
		Regione del Veneto					
(*) Please add as many rows you need							
Role of the partner in relation to the pilot area (i.e. development agency, research centre, ...)		University					
A1.1 Wetland management plan							
		<input type="checkbox"/> foreseen					
		<input checked="" type="checkbox"/> * under preparation					

		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30px; border: 1px solid black;"><input type="checkbox"/></td> <td style="border: 1px solid black;">in force</td> </tr> <tr> <td style="border: 1px solid black;"><input type="checkbox"/></td> <td style="border: 1px solid black;">under implementation*</td> </tr> <tr> <td style="border: 1px solid black;"><input type="checkbox"/></td> <td style="border: 1px solid black;">none</td> </tr> </table> <p>* The Management Plan for the UNESCO World Heritage Site “Venice and its Lagoon” was prepared for the period 2012–2018 and is currently being updated. The management plan for the Natura 2000 site “Venice Lagoon” is currently being drafted.</p> <p>If present, is CC mentioned amongst pressures?</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border: 1px solid black; text-align: center;">Yes</td> <td style="width: 50%; border: 1px solid black; text-align: center;">No</td> </tr> <tr> <td style="border: 1px solid black; height: 20px;"></td> <td style="border: 1px solid black; height: 20px;"></td> </tr> </table> <p>If present, is adaptation to CC mentioned amongst management measures?</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border: 1px solid black; text-align: center;">Yes</td> <td style="width: 50%; border: 1px solid black; text-align: center;">No</td> </tr> <tr> <td style="border: 1px solid black; height: 20px;"></td> <td style="border: 1px solid black; height: 20px;"></td> </tr> </table> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 45%;"> <p>A1.2 Wetland typology</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30px; border: 1px solid black;"><input checked="" type="checkbox"/></td> <td style="border: 1px solid black;">marine/coastal (**)</td> </tr> <tr> <td style="border: 1px solid black;"><input type="checkbox"/></td> <td style="border: 1px solid black;">inland (***)</td> </tr> <tr> <td style="border: 1px solid black;"><input type="checkbox"/></td> <td style="border: 1px solid black;">artificial (****)</td> </tr> </table> </div> <div style="width: 45%;"> <p>A1.3 Dominant salinity</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30px; border: 1px solid black;"><input type="checkbox"/></td> <td style="border: 1px solid black;">fresh water</td> </tr> <tr> <td style="border: 1px solid black;"><input checked="" type="checkbox"/></td> <td style="border: 1px solid black;">brackish water</td> </tr> <tr> <td style="border: 1px solid black;"><input type="checkbox"/></td> <td style="border: 1px solid black;">salt water</td> </tr> </table> </div> </div> <p>(**) including estuaries, deltas and coastal lagoons (***) including rivers, marshes and peatlands (****) including ponds, wastewater treatment areas, salt exploration sites and aquacultures</p> <p>A1.4 Presence of water</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; border: 1px solid black; text-align: center;">Permanent</td> <td style="width: 25%; border: 1px solid black; text-align: center;">Seasonal</td> <td style="width: 25%; border: 1px solid black; text-align: center;">Temporary</td> <td style="width: 25%; border: 1px solid black; text-align: center;">Intermittent</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">X</td> <td style="border: 1px solid black;"></td> <td style="border: 1px solid black;"></td> <td style="border: 1px solid black;"></td> </tr> </table>	<input type="checkbox"/>	in force	<input type="checkbox"/>	under implementation*	<input type="checkbox"/>	none	Yes	No			Yes	No			<input checked="" type="checkbox"/>	marine/coastal (**)	<input type="checkbox"/>	inland (***)	<input type="checkbox"/>	artificial (****)	<input type="checkbox"/>	fresh water	<input checked="" type="checkbox"/>	brackish water	<input type="checkbox"/>	salt water	Permanent	Seasonal	Temporary	Intermittent	X			
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A.2	Scientific Background	<p>The area has scientific information and data on:</p> <p><input checked="" type="checkbox"/> A2.1 Floristic Species</p> <p>If yes, please describe the level of the available information (****)</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>Information about floristic distribution are available for the coastal areas of the northern lagoon. In particular, the different composition of floristic patterns - in terms of endemic, protected and exotic species - is mapped through 5 different levels of “floristic value”, which depend on the presence of exotic species. In general, the floristic system of the lagoon is typical of north-adriatic coastal areas.</p> </div> <p>(****) please provide a short description of the most emblematic habitat and species</p> <table style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 50%; border: none;">Please indicate the study surface coverage:</td> <td style="width: 10%; border: 1px solid black; text-align: center;">X</td> <td style="width: 30%; border: 1px solid black;">Whole area</td> <td style="width: 10%; border: 1px solid black; text-align: center;">100%</td> </tr> <tr> <td style="border: none;"></td> <td style="border: 1px solid black;"></td> <td style="border: 1px solid black;">Partial</td> <td style="border: 1px solid black; text-align: center;">0 %</td> </tr> </table>	Please indicate the study surface coverage:	X	Whole area	100%			Partial	0 %																										
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		<p>Floristic map</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Yes</td> <td style="width: 50%;">No</td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> </tr> </table> <p>Please indicate the detail level of the information</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Low</td> <td style="width: 33%;">Medium</td> <td style="width: 33%;">High</td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> <td></td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Old</td> <td style="width: 33%;">Recent</td> <td style="width: 33%;">Up-to-date</td> </tr> <tr> <td></td> <td style="text-align: center;">X*</td> <td></td> </tr> </table> <p>* Source: Atlante della Laguna</p> <p>Floristic monitoring plan</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">None</td> <td style="width: 25%;">Under preparation</td> <td style="width: 25%;">Under implementation</td> <td style="width: 25%;">In force</td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> </tr> </table> <p><input type="checkbox"/> Yes <input type="checkbox"/> A2.2 Vegetation</p> <p>If yes, please describe the level of the available information (****)</p> <div style="border: 1px solid black; padding: 5px;"> <p>The knowledge about the aquatic vegetation system is wide and detailed. A number of maps about the distribution of phytoplankton, macroalgae and phanerogams is available. On the contrary, for what concerns the terrestrial vegetal landscape, just small areas are described through detailed maps. In general, the vegetation in the Venice lagoon is different from other Mediterranean areas and it is more similar to European coastal atlantic communities. This depends mostly on climate patterns and tides gap.</p> </div> <p>(****) please provide a short description of the most emblematic habitat and species</p> <p>Please indicate the study surface coverage:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">X</td> <td style="width: 40%;">Whole area</td> <td style="width: 50%;">100%</td> </tr> <tr> <td></td> <td>Partial</td> <td>0 %</td> </tr> </table> <p>Vegetation map</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Yes</td> <td style="width: 50%;">No</td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> </tr> </table> <p>Habitat map (sensu 92/43 EEC)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Yes</td> <td style="width: 50%;">No</td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> </tr> </table> <p>Please indicate the detail level of the information</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Low</td> <td style="width: 33%;">Medium</td> <td style="width: 33%;">High</td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;">X</td> </tr> </table>	Yes	No	X		Low	Medium	High		X		Old	Recent	Up-to-date		X*		None	Under preparation	Under implementation	In force	X				X	Whole area	100%		Partial	0 %	Yes	No	X		Yes	No	X		Low	Medium	High			X
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* LIFE VIMINE Project (2013-2017) for marshes (also monitoring)

no **yes** A2.4 Hydro-geological resources

If yes, please describe the level of the available information (****)

The available information on the hydro-geological system is rich and detailed. There are information and maps on: tide effects, winds effects, salinity of water, phosphorus levels, inorganic nitrates, chlorophyll, fresh water, rivers mouths and underground water. For some data, such as salinity, phosphorus, nitrates and chlorophyll, the evolution along years and along seasons is also available.

(****) please provide a short description of the most emblematic habitat and species

Please indicate the study surface coverage:

Whole area	100%
Partial	- %

Hydrogeological cartography

Yes	No
X	

Please indicate the detail level of the information

Low	Medium	High
		X

Old	Recent	Up-to-date
		X

Hydro-geological monitoring plan

None	Under preparation	Under implementation	In force
		X*	

* DGR n. 401 del 31 marzo 2015 "Bacino Idrografico Scolante nella Laguna di Venezia. Adozione del Piano di Assetto Idrogeologico (PAI)"

Quality of Water monitoring plan

None	Under preparation	Under implementation	In force
		X*	

* Piano per la prevenzione dell'inquinamento ed il risanamento delle acque del bacino idrografico immediatamente sversante nella Laguna di Venezia (Piano Direttore 2000) and Piano di tutela delle acque (Art. 121,

Decreto legislativo 3 aprile 2006, n. 152, "Norme in materia ambientale"), the latter currently under review

A2.5 Faunistic resources

If yes, please describe the level of the available information (****)

Entomo-fauna	Ittio-fauna	Avi-fauna	Mammalo-fauna
X	X	X	X

All the different types of fauna are analysed. For the entomo-fauna there are information about: foraminifera, mesozooplankton and invertebrates. There are also information about the ittio-fauna, as well as amphibians and reptiles. For the avi-fauna there are data and maps about different species, as well as their distribution along the year. For mammalo-fauna the only available information are about micro-mammals such as mices and other small rodents.

(****) please provide a short description of the most emblematic habitat and species

Please indicate the study surface coverage:

X	Whole area	100%
	Partial	- %

Faunistic cartography

Yes	No
X	

Please indicate the knowledge on the conservation status of species

Directive	Yes	No	Which Species
92/43/EEC (Habitat)	X		Pomatoschistus canestrinii, Knipowitschia panizzae, Pinna nobilis,
2009/147/E C (Birds)			Egretta garzetta, Circus aeruginosus, Himantopus himantopus, Charadrius alexandrinus, Pluvialis squatarola, Larus melanocephalus, Chlidonias niger, Sterna hirundo, Sterna sandvicensis, Sterna albifrons

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n.a.	high/medium/low					
n.a.	high/medium/low					
A.3	Values of the pilot wetland	<p><input checked="" type="checkbox"/> A3.1 Environmental heritage</p> <p>If yes, please describe the main features of this value (****)</p> <div style="border: 1px solid black; padding: 5px;"> <p>The Venice lagoon is the largest coastal lagoon of the Adriatic Sea, and one of the largest in Europe, with its 549 Km². The Northern Lagoon, that extends from the city of Venice until the lagoon terrestrial limit in the north, covers 220 km². The depth of Northern lagoon waterscape varies from few centimetres up to almost ten metres. Different levels of water salinity and the presence of several rivers mouths, make the lagoon particularly rich in habitats: sandbars, <i>velme</i>, swamps, channels, lagoon mouths, sandy dunes, fishing valleys. A botanical study identifies some priority habitats such as: dunes with pioneer herbal vegetation; dune forests with <i>Pinus pinea</i> and <i>Pinus pinaster</i>; coastal secondary lagoons; salt steppes (<i>Limonetalia</i>). The lagoon is particularly relevant in terms of biodiversity for what concerns birds and fishes, in fact there are Sites of Community Importance, Special Protection Areas, Important Bird Area and RAMSAR convention areas. Despite a long period of anthropic pressure that caused a severe damage for water and seabed soils quality, in the last few years a progressive improvement of the environment has been observed by experts.</p> </div> <p>(****) please provide a short description of the most emblematic habitat and species</p> <p><input checked="" type="checkbox"/> A3.2 Archaeological heritage</p> <p>If yes, please describe the main features of this value</p> <div style="border: 1px solid black; padding: 5px;"> <p>The Venice lagoon is a very interesting case in terms of archaeological studies, because the it represents an uninterrupted stratigraphy of almost 10.000 years of human history. Human presence in the area is testified since the Etruscan period and, since then, the coexistence between water and men continued to evolve. If we consider the inhabited emerged lands, the spatial issue obliged men to progressively build upon the previous historical period. This is why an archeological reading of the lagoon is so important and so complex to read at the same time.</p> </div> <p><input checked="" type="checkbox"/> A3.3 Historical heritage</p> <p>If yes, please describe the main features of this value</p>				

		<p>The Venice Lagoon is itself a testify of the past centuries of water colonisation and territorial expansion. Venice, that from the VI lto the XVIII century evolved from an elective duchy, to a republic to a <i>signoria</i>, maintained its independence and its domain on the Mediterranean thanks to a strategic geographic position. The lagoon was so important for Venice, that the Republic strongly transformed the hinterland in order to guarantee the delicate balance between land and sea..</p> <p><input type="checkbox"/> Yes A3.4 Architectonical heritage</p> <p>If yes, please describe the main features of this value</p> <p>Due to its long and prosperous history, Venice is a unique example of the superposition of architectural periods and styles. While the historical centre collected refined palaces, precious churches, and modern factories, the rest of the lagoon also hosted testimonies of different historical moments. The small islands of the Northern lagoon hosts traditional fisherman huts and boathouses; while the mainland, that represented the defense line during war, hosts military forts and traditional countryside farms.</p> <p><input type="checkbox"/> Yes A3.5 Ethnological heritage</p> <p>If yes, please describe the main features of this value</p> <p>Due to Lombards invasion of the Pianura Padana in the Ancient Roman period, people living in the hinterland found shelter on the emerged island of the Venice Lagoon and started adapting to this new life “upon the water”. This represents the beginning of the construction of a millennial culture related to the use of the lagoon; artifacts, tools and methods were implemented through centuries to exploit the lagoon for fishing and hunting, but also for navigate and trade.</p> <p><input type="checkbox"/> Yes A3.6 Landscape heritage</p> <p>If yes, please describe the main features of this value</p> <p>The Northern Lagoon’s landscape value is strongly connected to the long history of interdependence between human activities and natural dynamics. The Venice lagoon, in fact, is just apparently a natural landscape: the Venetians constantly transformed it in order to maintain channels, lagoon beds, fisheries and terrestrial borders. In this environment, therefore, “landscape heritage” means an integration between natural and cultural values. The combination of these two values is also relevant in economic terms, because the peculiar landscape of the Northern lagoon represents an important factor for tourism as well as for territorial marketing.</p>
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A.4	Main threats and impacts for the biodiversity of the pilot wetland	description of the threat		relevance of the impact		
				low	medium	high
		Agriculture				X
		Residential & commercial development				X
		Energy production & mining		X		
		Transportation & service corridors				X
		Over-exploitation, persecution & control				X
		Land use modification	Abandonment			X
			Intensification			X
			Other			
		Human intrusions & disturbance				X
		Natural system modifications				X
		Invasive & other problematic species & genes			X	
		Pollution			X	
Geological events			X			
Climate change & severe weather				X		
Other Please specify:						
A.5	Main reasons and expectations that underpin the governance process for the pilot area	<p>What are the main drivers for promoting a voluntary governance process like a Wetland Contract in the pilot area? (i.e. why to implement a governance process? why to adopt such kind of tool?)</p> <p>The northern part of the Venice lagoon represents a resource for many groups of interest, both social and economic. Some actions could take place to stimulate stakeholders' interest for such voluntary governance process:</p> <ul style="list-style-type: none"> ○ to control hydraulic dynamics at the scale of the entire lagoon's catchment area, in order to guarantee a healthy and active environment, fundamental for every other human activity; ○ to promote sustainable forms of tourism, both at the national and international level, as well as to enhance local use of the area, compatible with environmental dynamics; ○ to guarantee the existence and conservation of traditional activities (such as fishing and hunting) that today are under the risk of abandonment; ○ to integrate the maintenance and prosperity of mainland activities (as for instance agriculture) in equilibrium with the lagunar fragile balance. 				

		<p>What are the specific objectives and expected results from the Wetland Contract of the pilot area?</p> <div style="border: 1px solid black; padding: 5px;"> <p>The Wetland Contract could represent the tool for a shared use of the lagoon and the base for building a new community linkage amongst stakeholders. The previous attempts of regulating conflicts from above (such as the former Parco della Laguna Nord) didn't achieve the objective. The main objectives that a Wetland Contract could accomplish are:</p> <ul style="list-style-type: none"> ○ to guarantee and to enhance the biodiversity of the area ○ to enhance the economic potential of the area ○ to support multifunctional activities, integrating environmental protection with economic activities that can become a defensive tool; ○ to control the ways to access the area, avoiding problematic impacts due to wave swell, one of the main problem for the lagoon bed and borders. </div> <p>Which might be the role of the Wetland Contract for adaptation of pilot wetland to Climate Change?</p> <div style="border: 1px solid black; padding: 5px;"> <p>A Wetland Contract in the Northern Lagoon of Venice facilitates climate change adaptation by fostering coordinated, participatory management among local authorities, communities, and stakeholders. It supports integrated actions to restore habitats, enhance flood resilience, improve water quality, and preserve biodiversity, while promoting awareness and co-responsibility, ensuring that interventions are both ecologically effective and socially sustainable.</p> </div>
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A6	Auto evaluation of the global knowledge level for the target area and additional information	How do you evaluate the level of information regarding the target area?				
		Very poor	Poor	Sufficient	Rich	Complete
					X	
		How do you evaluate the quality of information regarding the target area?				
		Very low	Low	Sufficient	High	Very high
					X	
		How do you evaluate the level of information on CC regarding the target area?				
		Very poor	Poor	Sufficient	Rich	Complete
			X			
		How do you evaluate the quality of information on CC regarding the target area?				
Very low	Low	Sufficient	High	Very high		
	X					
Please describe additional information you consider relevant not already in this report						
None						
Please describe additional field of investigation you consider relevant for the target area to be added						
<p>As the Venice lagoon is an inhabited wetland for centuries, it would be very useful, for an integrated development of a Contract, to consider and unfold the existing social and economic dynamics in terms of: space, landscape, infrastructure, responsibility, urban development. Some specific fields of investigation could be:</p> <ul style="list-style-type: none"> ○ A depth investigation on the relation between human activities and the non-built environment; ○ hydraulic fragility of the lagoon, as a crucial issue for the surviving of habitats, species and human activities; ○ stereotyped images of “protection”, that can potentially represent an obstacle for new sustainable forms of development; ○ further understanding of CC impacts on the lagoon. 						

SCIENTIFIC DESCRIPTION REPORT

Pilot area name: Marano Lagoon

Partner Name: PP2 CRF - Riviera Friulana Community

Deliverable 1.2.3 - English summary

date: 30/07/2025

Notes:

This template is inspired by and coordinated with the documentation elaborated in the Interreg Med (2014-2020) WETNET project and the Interreg Italy-Croatia (2014-2020) CREW project.

Notes:

- 1) please respect the maximum number of characters for each chapter, in order to ensure the homogeneity of the partners' contributions.

Chapter number and name		Contents	
A.1	Pilot wetland ID	Name of the pilot wetland	Laguna di Marano e Grado
		Country	Italy
		Region/s	Friuli-Venezia Giulia
		Municipality/ies (*)	Number of inhabitants
		Carlino	2.608
		Latisana	13.217
		Lignano Sabbiadoro	6.905
		Marano Lagunare	1.681
		Muzzana del Turgnano	2.329
		Palazzolo dello Stella	2.861
		Pocenia	2.311
		Porpetto	2.453
		Precenicco	1.448
		Rivignano Teor	6.282
		Ronchis	1.955
		San Giorgio di Nogaro	7.317

		Total	51.367				
<p>(*) just those one that include (part of) the protected wetland. Please add as many rows you need.</p>							
<p>Organization/s responsible for the management of the pilot wetland</p>		<p>Name: Region of Friuli Venezia Giulia (D.Lgs 26/2001 and LR7/2008)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Public body</td> <td style="width: 33%; text-align: center;">X</td> <td style="width: 33%;">Private</td> <td style="width: 33%;"></td> </tr> </table>		Public body	X	Private	
Public body	X	Private					
<p>Other entities (Administrations, NGO, etc.) directly involved in the management of the pilot wetland *</p>		<p>Lagoon and maritime State Property (Demanio Lagunare – art.822 Civil Code)</p> <p>Venice Water Magistrate (Magistrato delle Acqua di Venezia - L.336/1963)</p> <p>Marano Lagunare Municipality</p> <p>Commons (Usi Civici - D.Lgs 42/2004)</p>					
<p>(*) Please add as many rows you need</p>							
<p>Role of the partner in relation to the pilot area (i.e. development agency, research centre, ...)</p>		<p>Association of municipalities that, while respecting institutional autonomy, promotes territorial and local development, integration between areas, improvement of citizen services, administrative efficiency, protection of cultural and linguistic identities, and democratic participation of local populations.</p>					

		<p>A1.1 Wetland management plan</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%; text-align: center;"><input type="checkbox"/></td> <td style="width: 15%;">foreseen</td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>under preparation</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>in force</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>under implementation</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>none</td> <td></td> <td></td> <td></td> </tr> </table> <p>If present, is CC mentioned amongst pressures?</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Yes</td> <td style="width: 50%; text-align: center;">No</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table> <p>If present, is adaptation to CC mentioned amongst management measures?</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Yes</td> <td style="width: 50%; text-align: center;">No</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> <div style="display: flex; justify-content: space-between; margin-top: 20px;"> <div style="width: 45%;"> <p>A1.2 Wetland typology</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%; text-align: center;"><input checked="" type="checkbox"/></td> <td style="width: 15%;">marine/coastal (**)</td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>inland (***)</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>artificial (****)</td> <td></td> <td></td> <td></td> </tr> </table> <p>(**) including estuaries, deltas and costal lagoons</p> <p>(***) including rivers, marshes and peatlands</p> <p>(****) including ponds, wastewater treatment areas, salt exploration sites and aquacultures</p> </div> <div style="width: 45%;"> <p>A1.3 Dominant salinity</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%; text-align: center;"><input type="checkbox"/></td> <td style="width: 15%;">fresh water</td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>brackish water</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>salt water</td> <td></td> <td></td> <td></td> </tr> </table> </div> </div> <p>A1.4 Presence of water</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; text-align: center;">Permanent</td> <td style="width: 25%; text-align: center;">Seasonal</td> <td style="width: 25%; text-align: center;">Temporary</td> <td style="width: 25%; text-align: center;">Intermittent</td> </tr> </table>				<input type="checkbox"/>	foreseen				<input type="checkbox"/>	under preparation				<input checked="" type="checkbox"/>	in force				<input type="checkbox"/>	under implementation				<input type="checkbox"/>	none				Yes	No	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Yes	No	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	marine/coastal (**)				<input type="checkbox"/>	inland (***)				<input type="checkbox"/>	artificial (****)				<input type="checkbox"/>	fresh water				<input checked="" type="checkbox"/>	brackish water				<input type="checkbox"/>	salt water				Permanent	Seasonal	Temporary	Intermittent
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		X																			
A.2	Scientific Background	<p>The area has scientific information and data on:</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <input checked="" type="checkbox"/> A2.1 Floristic Species </div> <p>If yes, please describe the level of the available information (****)</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>Floristic data for the Marano and Grado lagoons are extensive but unevenly distributed. Historical studies and regional atlases provide species-level records, while recent surveys focus on habitat conservation and Natura 2000 priorities. Although rare and endemic species are well documented, a complete and updated floristic mapping of the lagoon area is still lacking.</p> </div> <p>(****) please provide a short description of the most emblematic habitat and species</p> <p>Regione FVG (2025). <i>Piano di gestione ZSC/ZPS IT3320037 Laguna di Marano e Grado – Allegato 2 al DPRReg 065/2025</i></p> <p>Regione FVG (2015). <i>La Laguna di Marano e Grado – Inquadramento ecologico</i></p> <p>ARPA FVG (2010). <i>Le trasformazioni ambientali della laguna di Marano e Grado</i></p> <div style="display: flex; justify-content: space-between; align-items: flex-start; margin-top: 20px;"> <div style="width: 60%;"> <p>Please indicate the study surface coverage:</p> </div> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="width: 10%;"><input checked="" type="checkbox"/></td> <td style="width: 40%;">Whole area</td> <td style="width: 50%;">100%</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Partial</td> <td>indicate %</td> </tr> </table> </div> <div style="margin-top: 20px;"> <p>Floristic map</p> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="width: 50%;">Yes</td> <td style="width: 50%;">No</td> </tr> <tr> <td><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> </div> <div style="margin-top: 20px;"> <p>Please indicate the detail level of the information</p> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="width: 33%;">Low</td> <td style="width: 33%;">Medium</td> <td style="width: 33%;">High</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table> </div>				<input checked="" type="checkbox"/>	Whole area	100%	<input type="checkbox"/>	Partial	indicate %	Yes	No	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Low	Medium	High	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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		<p>Please indicate the study surface coverage:</p>		Partial		indicate %							
		<p>Vegetation map</p> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="width: 50px; text-align: center;">Yes</td> <td style="width: 50px; text-align: center;">No</td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> </tr> </table>	Yes	No	X								
Yes	No												
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		<p>Habitat map (sensu 92/43 EEC)</p> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="width: 50px; text-align: center;">Yes</td> <td style="width: 50px; text-align: center;">No</td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> </tr> </table>	Yes	No	X								
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		<table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="width: 40px; text-align: center;">Yes</td> <td>A2.3 Evolution of vegetal landscape</td> </tr> </table>	Yes	A2.3 Evolution of vegetal landscape									
Yes	A2.3 Evolution of vegetal landscape												
		<p>If yes, please describe the level of the available information (****)</p> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="padding: 5px;"> The vegetation landscape of the Grado and Marano lagoons has evolved under natural and anthropogenic pressures. Historical regression of saltmarshes and dune systems has altered plant communities, yet halophytic and psammophytic series remain well- </td> </tr> </table>	The vegetation landscape of the Grado and Marano lagoons has evolved under natural and anthropogenic pressures. Historical regression of saltmarshes and dune systems has altered plant communities, yet halophytic and psammophytic series remain well-										
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		<p>structured. Recent mapping and habitat monitoring reveal shifts due to sedimentation, freshwater input, and human activities like aquaculture and tourism².</p> <p>(****) please provide a short description of the most emblematic habitat and species</p> <p>Regione FVG (2025). <i>Piano di gestione ZSC/ZPS IT3320037 Laguna di Marano e Grado – Allegato 2 al DPR 065/2025.</i></p>								
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Whole area	100%									
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		<p>Evolution of vegetal landscape map</p> <table border="1" style="margin-left: auto;"> <tr> <td>Yes</td> <td>No</td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> </tr> </table>	Yes	No		X				
Yes	No									
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Low	Medium	High								
		<table border="1" style="margin-left: auto;"> <tr> <td>Old</td> <td>Recent</td> <td>Up-to-date</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>	Old	Recent	Up-to-date					
Old	Recent	Up-to-date								
		<p>Vegetal Landscape monitoring plan</p> <table border="1" style="margin-left: auto;"> <tr> <td>None</td> <td>Under preparation</td> <td>Under implementation</td> <td>In force</td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> </tr> </table>	None	Under preparation	Under implementation	In force	X			
None	Under preparation	Under implementation	In force							
X										
		<table border="1" style="margin-left: auto;"> <tr> <td style="text-align: center;">Yes</td> <td>A2.4 Hydro-geological resources</td> </tr> </table>	Yes	A2.4 Hydro-geological resources						
Yes	A2.4 Hydro-geological resources									

		<p>If yes, please describe the level of the available information (****)</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>The Grado and Marano lagoons span over 16,000 ha and are shaped by tidal exchanges, sediment transport, and freshwater inflows. Six tidal inlets regulate circulation, while internal sub-basins show distinct hydrodynamic behavior. The area has been studied through bathymetric surveys, sediment modelling, and morphological mapping. The management plan provides detailed data on erosion, progradation, and anthropogenic pressures affecting lagoon morphology.</p> </div> <p>(****) please provide a short description of the most emblematic habitat and species</p> <p>ARPA Friuli Venezia Giulia (2010). <i>Le trasformazioni ambientali della laguna di Marano e Grado</i>. Direzione centrale ambiente e lavori pubblici, Servizio tutela da inquinamento atmosferico e idrico.</p> <p>Regione FVG (2025). <i>Piano di gestione ZSC/ZPS IT3320037 Laguna di Marano e Grado – Allegato 21 al DPRReg 065/2025</i>.</p> <p>Regione FVG (2018). <i>Piano regionale di tutela delle acque – DPRReg 074/2018</i>.</p> <p>ISMAR-CNR. <i>Studio dell'idrodinamica e del trasporto dei sedimenti nelle lagune di Marano e Grado</i></p> <p>Please indicate the study surface coverage:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 30px; text-align: center;">X</td> <td style="width: 100px;">Whole area</td> <td style="width: 100px;">100%</td> </tr> <tr> <td></td> <td>Partial</td> <td>indicate %</td> </tr> </table> <p>Hydrogeological cartography</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 50px; text-align: center;">Yes</td> <td style="width: 50px; text-align: center;">No</td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> </tr> </table> <p>Please indicate the detail level of the information</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 50px; text-align: center;">Low</td> <td style="width: 50px; text-align: center;">Medium</td> <td style="width: 50px; text-align: center;">High</td> </tr> </table>	X	Whole area	100%		Partial	indicate %	Yes	No	X		Low	Medium	High
X	Whole area	100%													
	Partial	indicate %													
Yes	No														
X															
Low	Medium	High													

(****) please provide a short description of the most emblematic habitat and species

Regione FVG (2025). *Piano di gestione ZSC/ZPS IT3320037 Laguna di Marano e Grado – Allegati 2-10*

Ministero dell’Ambiente e della Sicurezza Energetica (2022). *Natura 2000 Standard Data Form – ZPS IT3320037 Laguna di Marano e Grado*

Please indicate the study surface coverage:

X	Whole area	100%
	Partial	indicate %

Faunistic cartography

Yes	No
X	

Please indicate the knowledge on the conservation status of species

Directive	Yes	No	Which Species
92/43/EEC	X		<i>Acipenser naccarii</i> <i>Alosa fallax</i> <i>Aphanius fasciatus</i> <i>Bombina variegata</i> <i>Caretta caretta</i> <i>Emys orbicularis</i> <i>Knipowitschia panizzae</i> <i>Lycaena dispar</i> <i>Pomatoschistus canestrinii</i> <i>Rana latastei</i> <i>Salicornia veneta</i> Scientific name <i>Triturus carnifex</i> <i>Tursiops truncatus</i> <i>Vertigo angustior</i>
2009/147/EC	X		<i>Acrocephalus melanopogon</i>

						<i>Acrocephalus paludicola</i> <i>Acrocephalus schoenobaenus</i> <i>Alcedo atthis</i> <i>Anas acuta</i> <i>Anas crecca</i> <i>Anas platyrhynchos</i> <i>Anser albifrons</i> <i>Anser anser</i> <i>Anser anser</i> <i>Anser fabalis</i> <i>Anthus campestris</i> <i>Ardea alba</i> <i>Ardea cinerea</i> <i>Ardea purpurea</i> <i>Ardeola ralloides</i> <i>Asio flammeus</i> <i>Aythya ferina</i> <i>Aythya fuligula</i> <i>Aythya marila</i> <i>Aythya nyroca</i> <i>Botaurus stellaris</i> <i>Branta leucopsis</i> <i>Branta ruficollis</i> <i>Bubulcus ibis</i> <i>Bucephala clangula</i> <i>Buteo rufinus</i> <i>Calandrella brachydactyla</i> <i>Calidris alba</i> <i>Calidris alpina</i> <i>Calidris canutus</i> <i>Calidris pugnax</i> <i>Calonectris diomedea</i> <i>Caprimulgus europaeus</i> <i>Cettia cetti</i> <i>Charadrius alexandrinus</i>
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						<i>Charadrius hiaticula</i> <i>Chlidonias hybrida</i> <i>Chlidonias niger</i> <i>Ciconia ciconia</i> <i>Ciconia nigra</i> <i>Circaetus gallicus</i> <i>Circus aeruginosus</i> <i>Circus cyaneus</i> <i>Circus macrourus</i> <i>Circus pygargus</i> <i>Cisticola juncidis</i> <i>Clamator glandarius</i> <i>Clanga clanga</i> <i>Clanga pomarina</i> <i>Coracias garrulus</i> <i>Crex crex</i> <i>Cyanecula svecica</i> <i>Cygnus columbianus</i> <i>Cygnus cygnus</i> <i>Cygnus olor</i> <i>Dryocopus martius</i> <i>Egretta garzetta</i> <i>Egretta garzetta</i> <i>Emberiza hortulana</i> <i>Eudromias morinellus</i> <i>Falco biarmicus</i> <i>Falco columbarius</i> <i>Falco eleonora</i> <i>Falco peregrinus</i> <i>Falco vespertinus</i> <i>Ficedula albicollis</i> <i>Fulica atra</i> <i>Gallinago media</i> <i>Gavia arctica</i> <i>Gavia immer</i> <i>Gavia stellata</i> <i>Gelochelidon nilotica</i> <i>Glareola pratincola</i> <i>Grus grus</i>
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						<i>Gyps fulvus</i> <i>Haematopus ostralegus</i> <i>Haliaeetus albicilla</i> <i>Hieraaetus pennatus</i> <i>Himantopus himantopus</i> <i>Hydrobates pelagicus</i> <i>Hydrocoloeus minutus</i> <i>Hydroprogne caspia</i> <i>Ixobrychus minutus</i> <i>Lanius collurio</i> <i>Lanius minor</i> <i>Larus genei</i> <i>Larus melanocephalus</i> <i>Larus michahellis</i> <i>Larus ridibundus</i> <i>Limosa lapponica</i> <i>Lullula arborea</i> <i>Mareca penelope</i> <i>Mareca strepera</i> <i>Melanocorypha calandra</i> <i>Mergellus albellus</i> <i>Mergus serrator</i> <i>Microcarbo pygmaeus</i> <i>Microcarbo pygmaeus</i> <i>Milvus migrans</i> <i>Milvus milvus</i> <i>Numenius arquata</i> <i>Numenius phaeopus</i> <i>Numenius tenuirostris</i> <i>Nycticorax nycticorax</i> <i>Otis tarda</i> <i>Pandion haliaetus</i>
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						<i>Pelecanus onocrotalus</i> <i>Pernis apivorus</i> <i>Phalacrocorax aristotelis</i> <i>Phalacrocorax carbo</i> <i>Phalacrocorax carbo</i> <i>Phalaropus lobatus</i> <i>Phoenicopterus ruber</i> <i>Platalea leucorodia</i> <i>Plegadis falcinellus</i> <i>Pluvialis apricaria</i> <i>Pluvialis squatarola</i> <i>Podiceps auritus</i> <i>Podiceps cristatus</i> <i>Podiceps nigricollis</i> <i>Porzana porzana</i> <i>Puffinus yelkouan</i> <i>Recurvirostra avosetta</i> <i>Recurvirostra avosetta</i> <i>Spatula clypeata</i> <i>Spatula querquedula</i> <i>Sterna hirundo</i> <i>Sternula albifrons</i> <i>Sylvia melanocephala</i> <i>Sylvia nisoria</i> <i>Tadorna ferruginea</i> <i>Tadorna tadorna</i> <i>Thalasseus sandvicensis</i> <i>Tringa erythropus</i> <i>Tringa glareola</i> <i>Tringa nebularia</i> <i>Tringa totanus</i> <i>Tringa totanus</i> <i>Xenus cinereus</i> <i>Zapornia parva</i> <i>Zapornia pusilla</i>
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Ministero dell'Ambiente e della Sicurezza Energetica (2022). *Natura 2000 Standard Data Form – ZPS IT3320037 Laguna di Marano e Grado*

Please indicate the detail level of the information

Low	Medium	High
		X

Old	Recent	Up-to-date
		X

Faunistic monitoring plan

None	Under preparation	Under implementation	In force
X			

Yes A2.6 Impacts of CC on wetland management

Identification of CC pressures on wetland

Yes	No
X	

Please specify:

CC pressure	detail
Sea level rise	High
Increase in water temperature	High
Alteration of precipitation patterns	Medium
Higher frequency of storm surges	Medium
Changes in river flows	Low

		Increase in air temperature	Medium																																								
<p>Identification of CC impacts on wetland</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Yes</td> <td style="width: 50%; text-align: center;">No</td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> </tr> </table> <p>Please specify:</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;">CC impacts</th> <th style="width: 30%;">detail</th> </tr> </thead> <tbody> <tr> <td>Loss of lagoon and brackish habitats</td> <td style="text-align: center;">High</td> </tr> <tr> <td>Alteration of aquatic ecosystems</td> <td style="text-align: center;">High</td> </tr> <tr> <td>Coastal erosion and degradation of salt marshes (barene)</td> <td style="text-align: center;">Medium</td> </tr> <tr> <td>Increased flood risk</td> <td style="text-align: center;">High</td> </tr> <tr> <td>Salinization of freshwater and soils</td> <td style="text-align: center;">Medium</td> </tr> <tr> <td>Intensification of subsidence</td> <td style="text-align: center;">Medium</td> </tr> <tr> <td>Spread of alien and invasive species</td> <td style="text-align: center;">Medium</td> </tr> <tr> <td>Loss of ecosystem services</td> <td style="text-align: center;">Low</td> </tr> </tbody> </table> <p>Identification of CC adaptation measures on wetland</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Yes</td> <td style="width: 50%; text-align: center;">No</td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> </tr> </table> <p>Please specify:</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;">CC adaptation measure</th> <th style="width: 30%;">detail</th> </tr> </thead> <tbody> <tr> <td>Sediment recovery</td> <td style="text-align: center;">High</td> </tr> <tr> <td>Creation of lagoon barriers</td> <td style="text-align: center;">Medium</td> </tr> <tr> <td>Promotion of natural sedimentation</td> <td style="text-align: center;">High</td> </tr> <tr> <td>Restoration and management of saltmarshes</td> <td style="text-align: center;">High</td> </tr> <tr> <td>Regulation of river inflows</td> <td style="text-align: center;">Medium</td> </tr> <tr> <td>Control of invasive species</td> <td style="text-align: center;">Medium</td> </tr> </tbody> </table> <p style="font-size: small; margin-top: 20px;">Regione FVG (2025). Piano di gestione ZSC/ZPS IT3320037 Laguna di Marano e Grado ARPA FVG. (2024). Segnali dal Clima in FVG 2024</p>				Yes	No	X		CC impacts	detail	Loss of lagoon and brackish habitats	High	Alteration of aquatic ecosystems	High	Coastal erosion and degradation of salt marshes (barene)	Medium	Increased flood risk	High	Salinization of freshwater and soils	Medium	Intensification of subsidence	Medium	Spread of alien and invasive species	Medium	Loss of ecosystem services	Low	Yes	No	X		CC adaptation measure	detail	Sediment recovery	High	Creation of lagoon barriers	Medium	Promotion of natural sedimentation	High	Restoration and management of saltmarshes	High	Regulation of river inflows	Medium	Control of invasive species	Medium
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		<p>Fontolan, G. (2023). <i>Le coste e la laguna nel clima che cambia: evidenze in Friuli Venezia Giulia</i>. ARPA FVG Ministero dell’Ambiente e della Sicurezza Energetica (2022). <i>Natura 2000 Standard Data Form – ZPS IT3320037 Laguna di Marano e Grado</i></p>	
A.3	Values of the pilot wetland	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	<p>A3.1 Environmental heritage</p> <p>If yes, please describe the main features of this value (****)</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>The Marano and Grado Lagoon constitutes a paradigmatic example of transitional wetland ecosystems, where marine tides, fluvial pulses, and sedimentary dynamics forge a constantly shifting mosaic of brackish environments. Situated at the junction of coastal plains and karst uplands, they encompass a suite of finely tuned ecotones—from mudflat pioneers to salt-marsh halophytes and reed beds along freshwater channels—each reflecting subtle salinity and hydrological gradients. This habitat diversity underpins a rich web of life, nourishing benthic invertebrates, fish nurseries, and migratory bird populations that traverse the Adriatic corridor. Beyond biodiversity, these wetlands provide indispensable ecosystem services: they filter pollutants, sequester carbon in organic soils, regulate flood peaks, and sustain centuries-old artisanal fisheries in harmony with natural rhythms. As frontline buffers to sea-level rise and salinisation, the Marano and Grado lagoons exemplify the deep interdependence of geomorphic processes and biological communities. Their resilience and connectivity underscore the urgent need to safeguard dynamic brackish ecosystems as reservoirs of ecological capital and cultural heritage for future generations.</p> </div> <p>(****) please provide a short description of the most emblematic habitat and species</p> <p>Regione FVG (2025). <i>Piano di gestione ZSC/ZPS IT3320037 Laguna di Marano e Grado – Allegato 2 al DPREg 065/2025</i></p> <p>Regione FVG (2015). <i>La laguna di Marano e Grado: un mosaico di biodiversità, un patrimonio da preservare.</i></p> <p>Regione FVG (2015). <i>La Laguna di Marano e Grado – Inquadramento ecologico</i></p> <p>ARPA FVG (2010). <i>Le trasformazioni ambientali della laguna di Marano e Grado</i></p>

		<p><input type="checkbox"/> Yes A3.2 Archaeological heritage</p> <p>If yes, please describe the main features of this value</p> <div style="border: 1px solid black; padding: 5px;"> <p>Marano Lagoon’s archaeological heritage spans over seven millennia, from Neolithic lakeside villages with cereal cultivation and flint workshops (c. 5500 BC) to Bronze Age trading posts linked by seaborne obsidian and metal goods. In Roman times, villas and canal networks facilitated amphora and glass exchange, reflecting a prosperous port economy. The 590 AD synod marks its Late Antique ecclesiastical prominence, while 11th–13th century fortifications and submerged weapons attest to Marano’s strategic maritime role under Byzantine, Patriarchal, and Venetian influences</p> </div> <p>Vinci, G., Fontana, A., Musina, G., Mancini, L., Lubritto, C., Liccioli, L. & Bernardini, F. (2023). <i>Beached swords from Marano Lagoon (northern Adriatic) reveal ancient land–sea connections and recent coastal evolution</i>. <i>Archaeometry</i> 65(2): 299–318.</p> <p>Museo Archeologico della Laguna di Marano</p> <p><input type="checkbox"/> Yes A3.3 Historical heritage</p> <p>If yes, please describe the main features of this value</p> <div style="border: 1px solid black; padding: 5px;"> <p>The lagoon bears a layered legacy shaped by water and human enterprise. Roman centuriation grids, ports, and pottery kilns reveal early engineering and trade. Medieval abbeys, Venetian fortresses, and expansive land-reclamation schemes transformed marshes into productive farmland. Archaeological remains and enduring dialects echo across its rivers, woods, and islands. Today, community-driven agritourism and conservation efforts revive this rich heritage, blending sustainable development with cultural memory.</p> </div> <p>Atlante dei luoghi della Riviera Friulana - https://www.atlantedeiluoghirivierafrilana.it/</p> <p><input type="checkbox"/> Yes A3.4 Architectonical heritage</p>
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		<p>If yes, please describe the main features of this value</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>Marano–Grado Lagoon’s architecture spans two millennia. In the 1st century AD, Roman canals linked Aquileia to Grado and villas at Bioni and Ara del Gorgo featured mosaics and hypocausts. Early medieval sites like Sant’Eufemia in Grado (c. 579 AD) and Sant’Andrea (8th c.) reflect Byzantine influence. From c. 1450, Marano’s Patriarchal walls and Grado’s Venetian bastions (1620–35) fortified lagoon access, while reed-and-thatch casoni and the Barbana sanctuary (582 AD; later baroque) attest to vernacular resilience.</p> </div> <p>Museo Archeologico della Laguna di Marano</p> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px; margin-right: 5px;">Yes</div> A3.5 Ethnological heritage
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		<p>submerged channels, mudbanks, seasonal islets, and farmlands behind embankments. Historical reclamations reshaped marsh margins into polders, reducing tidal exchange and altering sediment flows. Limited inlets sustain discrete hydrological zones, with tidal oscillations driving salinity gradients and habitat diversity. This mosaic of natural and cultivated environments reflects centuries of human-landscape interaction.</p> <p>Atlante dei luoghi della Riviera Friulana - https://www.atlantedeiluoghirivierafriulana.it/</p>				
A.4	Main threats and impacts for the biodiversity of the pilot wetland	description of the threat		relevance of the impact		
				low	medium	high
		Agriculture				X
		Residential & commercial development				X
		Energy production & mining		X		
		Transportation & service corridors				X
		Over-exploitation, persecution & control				X
		Land use modification	Abandonment			X
			Intensification			X
			Other			
		Human intrusions & disturbance				X
		Natural system modifications				X
		Invasive & other problematic species & genes			X	
		Pollution				X
		Geological events			X	
Climate change & severe weather				X		
Other	Please specify:					

<p>A.5</p>	<p>Main reasons and expectations that underpin the governance process for the pilot area</p>	<p>What are the main drivers for promoting a voluntary governance process like a Wetland Contract in the pilot area? (i.e. why to implement a governance process? why to adopt such kind of tool?)</p> <div style="border: 1px solid black; padding: 5px;"> <p>The main drivers for promoting a voluntary governance process like a Wetland Contract in the pilot area are environmental, economic, service-related, cultural, and ethnographic. Climate change increases the urgency to protect and manage the wetland system effectively. A participatory governance tool is essential, as many of the stakeholders involved both contribute to the pressures on the area and have a strong interest in its conservation. The Wetland Contract enables coordinated actions, shared responsibilities, and long-term commitments to safeguard the area’s ecological and socio-cultural value.</p> </div> <p>What are the specific objectives and expected results from the Wetland Contract of the pilot area?</p> <div style="border: 1px solid black; padding: 5px;"> <p>The Wetland Contract aims to protect and restore the ecosystem, improve water quality, reduce environmental pressures, and promote sustainable and climate resilient economic activities. It also seeks to enhance ecosystem services, preserve cultural and ethnographic heritage, and strengthen cooperation and participation among institutions, local stakeholders, and communities for long-term, climate-resilient management.</p> </div> <p>Which might be the role of the Wetland Contract for adaptation of pilot wetland to Climate Change?</p> <div style="border: 1px solid black; padding: 5px;"> <p>The Wetland Contract can play a key role in climate change adaptation by promoting coordinated actions to restore ecosystem functions, reduce vulnerabilities to extreme events, and ensure sustainable land and water use. It provides a shared framework for stakeholders to implement nature-based solutions, enhance resilience, and preserve the ecological, social, and economic value of the wetland in the face of climate challenges.</p> </div>
<p>A6</p>	<p>Auto evaluation of the global</p>	<p>How do you evaluate the level of information regarding the target area?</p>

knowledge level for the target area and additional information	Very poor	Poor	Sufficient	Rich	Complete
					X
	How do you evaluate the quality of information regarding the target area?				
	Very low	Low	Sufficient	High	Very high
				X	
	How do you evaluate the level of information on CC regarding the target area?				
	Very poor	Poor	Sufficient	Rich	Complete
				X	
	How do you evaluate the quality of information on CC regarding the target area?				
	Very low	Low	Sufficient	High	Very high
			X		
Please describe additional information you consider relevant not already in this report					
<p>The current knowledge framework lacks fine-scale, up-to-date vegetation distribution maps, continuous monitoring of water quality and sediment budgets, and high-resolution hydrodynamic models calibrated for future sea-level rise and extreme weather scenarios. Systematic surveys of benthic macroinvertebrates and seagrass meadows are also missing, along with detailed socio-economic assessments of the lagoon's ecosystem services.</p>					
Please describe additional field of investigation you consider relevant for the target area to be added					
<p>New field of investigation could feature broad sections on sedimentation and hydrodynamic processes under climate change and a summary of key biodiversity gaps, especially for benthic and</p>					



		<p>aquatic communities. Adding a socio-economic valuation of ecosystem services would further strengthen the scientific framework. This field of investigation could be developed by involving the research institution that are active in the area, i.e. The Departments of Geosciences of the Universities of Udine and Trieste and National Institute of Oceanography and Applied Geophysics.</p>
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SCIENTIFIC DESCRIPTION REPORT

Pilot area name: Po delta "*Pianura di Ferrara*" reclamation district

Partner Name: PP3 CBPF - Ferrara Plain Reclamation Consortium

Deliverable 1.2.3 - English summary

Notes:

This template is inspired by and coordinated with the documentation elaborated in the Interreg Med (2014-2020) WETNET project and the Interreg Italy-Croatia (2014-2020) CREW project.

Authors:

Sergio Fortini (Città Della Cultura/ Cultura della Città)

Anna Luciani (Città Della Cultura/ Cultura della Città)

Martina Berneschi CBPF

Notes:

2) please respect the maximum number of characters for each chapter, in order to ensure the homogeneity of the partners' contributions.

Chapter number and name		Contents							
A.1	Pilot wetland ID	<table border="1"> <tr> <td>Name of the pilot wetland</td> <td>Po di Volano</td> </tr> <tr> <td>Country</td> <td>Italia</td> </tr> <tr> <td>Region/s</td> <td>Emilia Romagna</td> </tr> </table>		Name of the pilot wetland	Po di Volano	Country	Italia	Region/s	Emilia Romagna
Name of the pilot wetland	Po di Volano								
Country	Italia								
Region/s	Emilia Romagna								
		Municipality/ies (*)	Number of inhabitants (dati istat)						
		Ferrara	129.384						
		Copparo	15.681						
		Tresignana	7.011						
		Fiscaglia	8.439						
		Lagosanto	4.643						
		Ostellato	5.581						
		Codigoro	10.948						
		Comacchio	21.913						
		Mesola	6.391						
		Riva del Po	7.442						
		Goro	3.395						
		Totale	220.828						

<p>(*) just those one that include (part of) the protected wetland. Please add as many rows you need.</p>																													
<p>Organization/s responsible for the management of the pilot wetland</p>		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="4">Name: Consorzio di Bonifica Pianura di Ferrara</td> </tr> <tr> <td style="width: 25%;">Public body</td> <td style="width: 10%; text-align: center;">x</td> <td style="width: 25%;">Private</td> <td style="width: 40%;"></td> </tr> </table>				Name: Consorzio di Bonifica Pianura di Ferrara				Public body	x	Private																	
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		<p>River — which falls under the responsibility of the Emilia-Romagna Region — the river plays a crucial role for both land drainage and irrigation supply. For this reason, CBPF is actively involved in decision-making processes related to the river stretch and cooperates closely with the Region and all other competent authorities in the management of water levels and resources of the Po di Volano.</p> <p>A1.1 Wetland management plan</p> <table border="1"> <tr> <td><input type="checkbox"/></td> <td>foreseen</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>under preparation</td> </tr> <tr> <td><input type="checkbox"/></td> <td>in force</td> </tr> <tr> <td><input type="checkbox"/></td> <td>under implementation</td> </tr> <tr> <td><input type="checkbox"/></td> <td>none</td> </tr> </table> <p>If present, is CC mentioned amongst pressures?</p> <table border="1"> <tr> <td>Yes</td> <td>No</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table> <p>If present, is adaptation to CC mentioned amongst management measures?</p> <table border="1"> <tr> <td>Yes</td> <td>No</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table> <p>A1.2 Wetland typology</p>	<input type="checkbox"/>	foreseen	<input checked="" type="checkbox"/>	under preparation	<input type="checkbox"/>	in force	<input type="checkbox"/>	under implementation	<input type="checkbox"/>	none	Yes	No	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Yes	No	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>A1.3 Dominant salinity</p>
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A.2	Scientific Background	<p>The area has scientific information and data on:</p> <table border="1"> <tr> <td><input checked="" type="checkbox"/></td> <td>A2.1 Floristic Species</td> </tr> </table> <p>If yes, please describe the level of the available information (****)</p> <div style="border: 1px solid black; padding: 5px;"> <p>(max 500 characters)</p> <p>The territory encompassed by the pilot area benefits from a fairly substantial body of available information. The sections pertaining to the Po Delta Park are particularly well-documented, enriched by updated data stemming from scientific research and the work of specialized experts. By contrast, the more inland areas present a comparatively less detailed knowledge base, with information that remains limited and less systematically structured.</p> <p>Emblematic species: Cisto rosso, ninfea bianca, castagna d'acqua</p> </div> <p>(****) please provide a short description of the most emblematic habitat and species</p> <table border="1" style="width: 100%;"> <tr> <td>Whole area</td> <td>100%</td> </tr> </table>	<input checked="" type="checkbox"/>	A2.1 Floristic Species	Whole area	100%																
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		<p>comparatively less detailed knowledge base, with information that remains limited and less systematically structured.</p> <p>Emblematic species: maritime pine, holm oak, pedunculate oak, glasswort</p> <p>(*****) please provide a short description of the most emblematic habitat and species</p> <p>Please indicate the study surface coverage:</p> <table border="1" style="float: right; margin-left: auto;"> <tr> <td>Whole area</td> <td>100%</td> </tr> <tr> <td>Partial</td> <td>80 %</td> </tr> </table> <p>Vegetation map: A specific and detailed map of the agricultural crops within the area is currently being developed.</p> <table border="1" style="margin-left: auto;"> <tr> <td>Yes</td> <td>No</td> </tr> <tr> <td style="text-align: center;">x</td> <td></td> </tr> </table> <p>Habitat map (sensu 92/43 EEC)</p> <table border="1" style="margin-left: auto;"> <tr> <td>Yes</td> <td>No</td> </tr> <tr> <td style="text-align: center;">x</td> <td></td> </tr> </table> <p>Please indicate the detail level of the information</p> <table border="1" style="margin-left: auto;"> <tr> <td>Low</td> <td>Medium</td> <td>High</td> </tr> <tr> <td></td> <td style="text-align: center;">x</td> <td></td> </tr> </table> <table border="1" style="margin-left: auto; margin-top: 10px;"> <tr> <td>Old</td> <td>Recent</td> <td>Up-to-date</td> </tr> <tr> <td></td> <td style="text-align: center;">x</td> <td></td> </tr> </table> <p>Vegetation monitoring plan</p> <table border="1" style="margin-left: auto;"> <tr> <td>None</td> <td>Under preparation</td> <td>Under implementation</td> <td>In force</td> </tr> <tr> <td></td> <td style="text-align: center;">x</td> <td></td> <td></td> </tr> </table>	Whole area	100%	Partial	80 %	Yes	No	x		Yes	No	x		Low	Medium	High		x		Old	Recent	Up-to-date		x		None	Under preparation	Under implementation	In force		x		
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		<p>includes the European eel (<i>Anguilla anguilla</i>), sea bass, mullets, sand smelt (<i>Atherina boyeri</i>), gilthead bream, sand gobies, and shads.</p> <p>(****) please provide a short description of the most emblematic habitat and species</p> <p>Please indicate the study surface coverage:</p> <table border="1" style="float: right; margin-left: auto;"> <tr> <td>Whole area</td> <td>100%</td> </tr> <tr> <td>Partial</td> <td>100 %</td> </tr> </table> <p>Faunistic cartography</p> <table border="1" style="margin-left: auto;"> <tr> <td>Yes</td> <td>No</td> </tr> <tr> <td></td> <td style="text-align: center;">x</td> </tr> </table> <p>Please indicate the knowledge on the conservation status of species</p> <table border="1" style="margin-left: auto;"> <thead> <tr> <th>Directive</th> <th>Yes</th> <th>No</th> <th>Which Species</th> </tr> </thead> <tbody> <tr> <td>92/43/EEC</td> <td style="text-align: center;">x</td> <td></td> <td></td> </tr> <tr> <td>2009/147/EC</td> <td style="text-align: center;">x</td> <td></td> <td></td> </tr> </tbody> </table> <p>Please indicate the detail level of the information</p> <table border="1" style="margin-left: auto; margin-bottom: 10px;"> <tr> <td>Low</td> <td>Medium</td> <td>High</td> </tr> <tr> <td></td> <td style="text-align: center;">x</td> <td></td> </tr> </table> <table border="1" style="margin-left: auto;"> <tr> <td>Old</td> <td>Recent</td> <td>Up-to-date</td> </tr> <tr> <td></td> <td style="text-align: center;">x</td> <td></td> </tr> </table> <p>Faunistic monitoring plan</p> <table border="1" style="margin-left: auto;"> <thead> <tr> <th>None</th> <th>Under preparation</th> <th>Under implementation</th> <th>In force</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">x</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Whole area	100%	Partial	100 %	Yes	No		x	Directive	Yes	No	Which Species	92/43/EEC	x			2009/147/EC	x			Low	Medium	High		x		Old	Recent	Up-to-date		x		None	Under preparation	Under implementation	In force	x			
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		X	<p>A2.6 Impacts of CC on wetland management</p> <p>Identification of CC pressures on wetland</p> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Yes</td> <td style="width: 50%; text-align: center;">No</td> </tr> <tr> <td style="text-align: center;">x</td> <td></td> </tr> </table> <p>Please specify:</p> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;">CC pressure</th> <th style="width: 30%;">detail</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Salinity</td> <td style="text-align: center;">high/medium/low</td> </tr> <tr> <td style="text-align: center;">Drought (drought/ hydrological)</td> <td style="text-align: center;">high/medium/low</td> </tr> <tr> <td style="text-align: center;">Flooding</td> <td style="text-align: center;">high/medium/low</td> </tr> <tr> <td style="text-align: center;">Eustatism</td> <td style="text-align: center;">high/medium/low</td> </tr> <tr> <td style="text-align: center;">Subsidence</td> <td style="text-align: center;">high/medium/low</td> </tr> <tr> <td style="text-align: center;">Spread of invasive alien species (plants and animals)</td> <td style="text-align: center;">high/medium/low</td> </tr> <tr> <td style="text-align: center;">Temperature increase</td> <td style="text-align: center;">high/medium/low</td> </tr> </tbody> </table> <p>Identification of CC impacts on wetland</p> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Yes</td> <td style="width: 50%; text-align: center;">No</td> </tr> <tr> <td style="text-align: center;">x</td> <td></td> </tr> </table> <p>Please specify:</p> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;">CC impacts</th> <th style="width: 30%;">detail</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Salinisation of coastal areas</td> <td style="text-align: center;">high/medium/low</td> </tr> <tr> <td style="text-align: center;">Desertification of agricultural lands</td> <td style="text-align: center;">high/medium/low</td> </tr> <tr> <td style="text-align: center;">Loss of biodiversity in wetlands</td> <td style="text-align: center;">high/medium/low</td> </tr> <tr> <td style="text-align: center;">River flooding</td> <td style="text-align: center;">high/medium/low</td> </tr> <tr> <td style="text-align: center;">Flooding due to minor drainage network</td> <td style="text-align: center;">high/medium/low</td> </tr> </tbody> </table>	Yes	No	x		CC pressure	detail	Salinity	high/medium/low	Drought (drought/ hydrological)	high/medium/low	Flooding	high/medium/low	Eustatism	high/medium/low	Subsidence	high/medium/low	Spread of invasive alien species (plants and animals)	high/ medium /low	Temperature increase	high/medium/low	Yes	No	x		CC impacts	detail	Salinisation of coastal areas	high/medium/low	Desertification of agricultural lands	high/medium/low	Loss of biodiversity in wetlands	high/medium/low	River flooding	high/medium/low	Flooding due to minor drainage network	high/medium/low
Yes	No																																						
x																																							
CC pressure	detail																																						
Salinity	high/medium/low																																						
Drought (drought/ hydrological)	high/medium/low																																						
Flooding	high/medium/low																																						
Eustatism	high/medium/low																																						
Subsidence	high/medium/low																																						
Spread of invasive alien species (plants and animals)	high/ medium /low																																						
Temperature increase	high/medium/low																																						
Yes	No																																						
x																																							
CC impacts	detail																																						
Salinisation of coastal areas	high/medium/low																																						
Desertification of agricultural lands	high/medium/low																																						
Loss of biodiversity in wetlands	high/medium/low																																						
River flooding	high/medium/low																																						
Flooding due to minor drainage network	high/medium/low																																						

		<table border="1"> <tr> <td>Storm surges</td> <td>high/medium/low w</td> </tr> <tr> <td>Abandonment of inland or riverine and wetland areas by the population</td> <td>high/medium/low w</td> </tr> <tr> <td>Massive spread of alien species</td> <td>high/medium/low w</td> </tr> </table> <p>Identification of CC adaptation measures on wetland</p> <table border="1"> <tr> <td>Yes</td> <td>No</td> </tr> <tr> <td colspan="2">Ongoing</td> </tr> </table> <p>Please specify:</p> <table border="1"> <thead> <tr> <th>CC adaptation measure</th> <th>detail</th> </tr> </thead> <tbody> <tr> <td>Upgrade of the water management infrastructure system</td> <td>high/medium/low</td> </tr> <tr> <td>Design of anti-salt barriers</td> <td>high/medium/low</td> </tr> <tr> <td>Monitoring of groundwater salinity</td> <td>high/medium/low</td> </tr> <tr> <td>Other solutions under evaluation</td> <td>high/medium/low</td> </tr> </tbody> </table>	Storm surges	high/medium/low w	Abandonment of inland or riverine and wetland areas by the population	high/medium/low w	Massive spread of alien species	high/medium/low w	Yes	No	Ongoing		CC adaptation measure	detail	Upgrade of the water management infrastructure system	high/medium/low	Design of anti-salt barriers	high/medium/low	Monitoring of groundwater salinity	high/medium/low	Other solutions under evaluation	high/medium/low
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A.3	Values of the pilot wetland	<table border="1"> <tr> <td><input type="checkbox"/></td> <td>A3.1 Environmental heritage</td> </tr> </table> <p>If yes, please describe the main features of this value (****)</p> <div style="border: 1px solid black; padding: 5px;"> <p>The Po di Volano area encompasses a rich and diverse range of ecosystems, including coastal pine forests, wetlands such as marshes and wet meadows, dunes, and woodlands, supporting a high level of biodiversity. It is part of the Po Delta Biosphere Reserve (UNESCO MAB) and the UNESCO site "Ferrara, City of the Renaissance, and its Po Delta," representing a human-shaped landscape where natural and anthropic elements coexist. The area hosts unique plant and animal species and protected habitats within the Natura 2000 network. In particular, the Po di Volano State Nature Reserve is a key site for birdwatching and the conservation of both</p> </div>	<input type="checkbox"/>	A3.1 Environmental heritage																		
<input type="checkbox"/>	A3.1 Environmental heritage																					

		<p>migratory and resident bird species. The Po Delta Regional Park covers over 54,000 hectares, including multiple Ramsar Sites, Special Areas of Conservation (SACs), and Special Protection Areas (SPAs) designated for the protection of birds, wetlands, and habitat diversity, highlighting its outstanding ecological and conservation value at both national and European levels.</p> <p>(*****) please provide a short description of the most emblematic habitat and species</p> <p><input checked="" type="checkbox"/> A3.2 Archaeological heritage</p> <p>If yes, please describe the main features of this value</p> <p>The territory from Ferrara to the sea along the Po di Volano hosts key archaeological sites, including: the city of Spina (late 6th c. BC), a major river, maritime, and land trade hub; the Roman necropolis of Voghenza (1st–3rd c. AD); the early Christian church of Santa Maria in Padovetere (6th c.); the Augustan merchant ship discovered at Comacchio; and Dosso dei Sassi, an island with imperial-era residential remains. Artifacts are preserved at the Delta Antico Museum (Comacchio) and the National Archaeological Museum of Ferrara.</p> <p><input checked="" type="checkbox"/> A3.3 Historical heritage</p> <p>If yes, please describe the main features of this value</p> <p>The area’s historical heritage, within the Po Delta, is recognized by UNESCO as “Ferrara, City of the Renaissance, and its Po Delta” (1999) for its planned cultural landscape, and as a UNESCO MAB Biosphere Reserve (2015) for biodiversity and sustainable development. It includes historic towns like Comacchio, Este Renaissance <i>delizie</i>, the Castello della Mesola, the Abbey of</p>
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		<p>Pomposa, Etruscan sites such as Spina and Adria, as well as salt pans and lagoon valleys.</p> <p><input checked="" type="checkbox"/> A3.4 Architectonical heritage</p> <p>If yes, please describe the main features of this value</p> <p>Ferrara’s architectural heritage is marked by Renaissance design and the urban plan of Biagio Rossetti, with landmarks such as the Estense Castle and Palazzo dei Diamanti, integrated into the Po Delta landscape, part of the UNESCO site for its planned cultural value. The Delta also features the Este <i>Delizie</i> (ducal villas and residences), the town of Comacchio with its lagoons, and the Abbey of Pomposa, reflecting the deep interaction between Renaissance culture and the natural environment.</p> <p><input checked="" type="checkbox"/> A3.5 Ethnological heritage</p> <p>If yes, please describe the main features of this value</p> <p>“The Scariolanti”</p> <p>From the 15th to the 20th century, the <i>scariolanti</i>, laborers with shovel and wheelbarrow, built embankments, canals and reclaimed land across the Duchy of Ferrara. Hired weekly at midnight by horn call, only the first to arrive secured work. Their last activities took place in the 1940s along the Reno and Burana. This tradition inspired the song “<i>A mezzanotte in punto</i>”, written in Italian to unite workers from different regions and dialects.</p> <p><input checked="" type="checkbox"/> A3.6 Landscape heritage</p>
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		If yes, please describe the main features of this value				
		<p>The project area's landscape shows a deeply anthropic character, shaped by centuries of human intervention that transformed it into a layered environment where historical, natural, and productive elements coexist. Key examples are Ferrara, the first planned Renaissance city; the extensive land reclamations toward the sea, which defined the province's agricultural identity; and the sophisticated water management system, vital for hydrogeological balance. These values underpin its UNESCO World Heritage and UNESCO MAB designations.</p>				
A.4	Main threats and impacts for the biodiversity of the pilot wetland	description of the threat	relevance of the impact			
			low	medium	high	
		Agriculture			X	
		Residential & commercial development	X			
		Energy production & mining			X	
		Transportation & service corridors	X			
		Over-exploitation, persecution & control		X		
		Land use modification	Abandonment			X
			Intensification		X	
			Other	X		
		Human intrusions & disturbance	X			
		Natural system modifications		X		
		Invasive & other problematic species & genes		X		
		Pollution		X		
		Geological events	X			
Climate change & severe weather			X			
Other	Please specify: solar energy collection systems			X		

<p>A.5</p>	<p>Main reasons and expectations that underpin the governance process for the pilot area</p>	<p>What are the main drivers for promoting a voluntary governance process like a Wetland Contract in the pilot area? (i.e. why to implement a governance process? why to adopt such kind of tool?)</p> <div style="border: 1px solid black; padding: 5px;"> <p>(max 500 characters)</p> <p>Given the inherent complexity of the pilot area—arising both from its territorial specificities and from the plurality of actors operating at different scales—the Wetland Contract emerges as an innovative policy instrument. Its aim is to foster a shared model of governance, designed to promote coordination and dialogue among the Region, the Consortium, and the institutional stakeholders engaged in the sustainable management of these sensitive environments.</p> </div> <p>What are the specific objectives and expected results from the Wetland Contract of the pilot area?</p> <div style="border: 1px solid black; padding: 5px;"> <p>General Objectives</p> <ol style="list-style-type: none"> 1. To promote the implementation of local climate change adaptation measures; 2. To enhance environmental restoration and biodiversity conservation in the Po di Volano and its coastal wetland areas; 3. To ensure the sustainable management of water resources, both in terms of quality and quantity, for agricultural, productive, environmental, and social purposes; 4. To mitigate hydraulic and flood risks; 5. To foster socio-economic development and sustainable tourism within the riverine system; 6. To strengthen local communities' engagement and sense of territorial identity. </div>
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		<p>Which might be the role of the Wetland Contract for adaptation of pilot wetland to Climate Change?</p> <div style="border: 1px solid black; padding: 10px;"> <ol style="list-style-type: none"> 1. To enhance coordination among territorial authorities, 2. To mitigate flood risk in the Po di Volano basin, 3. To improve river ecosystem water quality and ecological functionality, 4. To ensure integrated water management, protect against saline intrusion, and strengthen monitoring and forecasting of climate change and human impact (extreme rainfall, drought, subsidence, sea-level rise). </div>																																								
A6	Auto evaluation of the global knowledge level for the target area and additional information	<p>How do you evaluate the level of information regarding the target area?</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td>Very poor</td> <td>Poor</td> <td>Sufficient</td> <td>Rich</td> <td>Complete</td> </tr> <tr> <td></td> <td></td> <td></td> <td>x</td> <td></td> </tr> </table> <p>How do you evaluate the quality of information regarding the target area?</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td>Very low</td> <td>Low</td> <td>Sufficient</td> <td>High</td> <td>Very high</td> </tr> <tr> <td></td> <td></td> <td></td> <td>x</td> <td></td> </tr> </table> <p>How do you evaluate the level of information on CC regarding the target area?</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td>Very poor</td> <td>Poor</td> <td>Sufficient</td> <td>Rich</td> <td>Complete</td> </tr> <tr> <td></td> <td></td> <td>x</td> <td></td> <td></td> </tr> </table> <p>How do you evaluate the quality of information on CC regarding the target area?</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td>Very low</td> <td>Low</td> <td>Sufficient</td> <td>High</td> <td>Very high</td> </tr> <tr> <td></td> <td></td> <td>x</td> <td></td> <td></td> </tr> </table>	Very poor	Poor	Sufficient	Rich	Complete				x		Very low	Low	Sufficient	High	Very high				x		Very poor	Poor	Sufficient	Rich	Complete			x			Very low	Low	Sufficient	High	Very high			x		
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		<p>Please describe additional information you consider relevant not already in this report</p> <div style="border: 1px solid black; padding: 5px;"><p>(max 500 characters)</p><p>The territory has historically been investigated by various art forms (in particular cinematographic, documentary and literary) especially starting from the post-war period and up to the seventies/eighties. A renewed curiosity from the point of view of narrative and artistic investigation in general is emerging in recent years, together with the awareness that climate change is significantly influencing the life of these habitats.</p></div> <p>Please describe additional field of investigation you consider relevant for the target area to be added</p> <div style="border: 1px solid black; padding: 5px;"><p>(max 500 characters)</p></div>
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SCIENTIFIC DESCRIPTION

REPORT

Pilot area name: Ofanto River

Partner Name: PP4 ANBO – Agency for Occupability and Development of
North Barese Ofantina Area

Deliverable 1.2.3 - Summary in English

date: 01/09/2025

Note:

This model is inspired and coordinated with the documentation developed in the Interreg project Med (2014-2020) WETNET and in the Interreg project Italy-Croatia (2014-2020) CREW.

Authors: Agenzia per l'Occupazione e lo Sviluppo dell'Area Nord Barese Ofantina

Note:

- 1) Please respect the maximum number of characters for each chapter, in order to ensure the homogeneity of the members' contributions.

Chapter number and name		Content	
A.1	Pilot identification of wetlands	Pilot's name wetland	Ofanto River
		Village	Italy
		Region(s)	Apulia
		Municipality(ies) (*)	Number of inhabitants
		Barletta	92.010
		Margherita di Savoia	11,063
		San Ferdinando di Puglia	13,910
		Trinitapoli	13,635
		Canosa di Puglia	27,466
		Minervino Murge	7,933
Spinazzola	5,824		
Total	171,841		
(*) only those that include (part of) the protected wetland. Please add AS MANY lines as you need.			

		<p>Organization(s) responsible for managing the pilot wetland</p>	<p>Name: Province of Barletta Andria Trani</p>												
			<p>Public body</p>	<p>X</p>	<p>Private</p>										
		<p>Other entities (Administrations, NGOs, etc.) directly involved in the management of the pilot wetland *</p>	<table border="1" style="width: 100%; height: 100px;"> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> </table>												
		<p>(*) Please add AS MANY lines YOU NEED</p>													
		<p>Role of the partner in relation to the pilot area (e.g. development agency, research centre, ...)</p>	<table border="1" style="width: 100%; height: 50px;"> <tr> <td>Local Development Agency for Member Municipalities</td> </tr> </table>			Local Development Agency for Member Municipalities									
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		<p>A1.1 Wetland Management Plan</p> <table style="width: 100%;"> <tr> <td style="width: 40px; text-align: center;"><input type="checkbox"/></td> <td>foreseen</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Under preparation</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>in force</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Under implementation</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>None</td> </tr> </table>				<input type="checkbox"/>	foreseen	<input type="checkbox"/>	Under preparation	<input type="checkbox"/>	in force	<input checked="" type="checkbox"/>	Under implementation	<input type="checkbox"/>	None
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		<p>If present, is CC mentioned among the pressures?</p> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="width: 50px; text-align: center;">YES</td> <td style="width: 50px; text-align: center;">NO</td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> </tr> </table> <p>If present, is it an adaptation to the CC mentioned among the management measures?</p> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="width: 50px; text-align: center;">YES</td> <td style="width: 50px; text-align: center;">NO</td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> </tr> </table> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: left;"> <p>A1.2 Wetland typology</p> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="width: 30px; text-align: center;">X</td> <td>marine/coastal (**)</td> </tr> <tr> <td style="text-align: center;">X</td> <td>inland (***)</td> </tr> <tr> <td></td> <td>artificial (****)</td> </tr> </table> </div> <div style="text-align: left;"> <p>A1.3 Dominant salinity</p> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="width: 30px; text-align: center;">X</td> <td>fresh water</td> </tr> <tr> <td style="text-align: center;">X</td> <td>brackish water</td> </tr> <tr> <td></td> <td>salt water</td> </tr> </table> </div> </div> <p>(**) including estuaries, deltas and lagoon coasts (***) including rivers, marshes and peat bogs (****) including ponds, wastewater treatment areas, salt exploration sites and aquaculture</p> <p>A1.4 Presence of water</p> <table border="1" style="margin-left: 20px; border-collapse: collapse; width: 100%;"> <thead> <tr> <th style="width: 25%;">Permanent</th> <th style="width: 25%;">Seasonal</th> <th style="width: 25%;">Temporary</th> <th style="width: 25%;">Intermittent</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	YES	NO		X	YES	NO		X	X	marine/coastal (**)	X	inland (***)		artificial (****)	X	fresh water	X	brackish water		salt water	Permanent	Seasonal	Temporary	Intermittent	X			
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A.2	Scientific context	<p>The area has information and scientific data on:</p> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="width: 30px; text-align: center;">X</td> <td>A2.1 Floristic Species</td> </tr> </table> <p>If yes, please describe the level of information available (****)</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Along the banks of the Ofanto there are specimens of <i>Salix alba</i> (both arboreal and shrubby) together with specimens of poplar (<i>P.</i></p> </div>	X	A2.1 Floristic Species																										
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alba, P. nigra, P. canescens). In the lower stretch of the river the trees and shrubs give way to the reed bed with *Phragmites australis*. The marshy environment of the mouth is characterised by the large presence of liquorice (*Glycyrrhiza glabra*).

(****) Please provide a brief description of the most emblematic habitats and species

Please indicate the study area coverage:

	The whole area	100%
X	Partial	indicate %

Floristic map

YES	NO
	X

Please indicate the level of detail of the information

Bass	Medium	High
X		

Old	Recent	Updated
	X	

Flora monitoring plan

Nobody	In preparation	Under implementation	In force
X			

X A2.2 Vegetation

If yes, please describe the level of information available (****)

Riparian forests dominated by Salix spp . and Populus spp . are present along the waterways of the Mediterranean basin, attributable to the Populion alliances albae and Salicion albae . Riparian forests are by nature azonal formations , being conditioned by soil moisture. They are generally stable communities until hydrological conditions change; in the case of more frequent flooding with long-lasting surface water, they tend to regress towards herbaceous formations; in the case of increasingly less frequent flooding, they tend to evolve towards more stable mesophilic communities .

(****) Please provide a brief description of the most emblematic habitats and species

Please indicate the study area coverage:

X	The whole area	100%
	Partial	indicate %

Vegetation map

YES	NO

Habitat map (sensu 92/43 EEC)

YES	NO
X	

Please indicate the level of detail of the information

Bass	Medium	High
	X	

Old	Recent	Updated
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	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 33%;"></td> <td style="width: 33%; text-align: center;">X</td> <td style="width: 33%;"></td> </tr> </table> <p>Vegetation monitoring plan</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 25%;">Nobody</td> <td style="width: 25%;">In preparation</td> <td style="width: 25%;">Under implementation</td> <td style="width: 25%;">In force</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table> <p><input checked="" type="checkbox"/> A2.3 Evolution of landscape plants</p> <p>If yes, please describe the level of information available (****)</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>In the past, wetland vegetation was subjected to significant anthropogenic pressure due to the tendency to increase the area of arable land and pastures. The pressure exerted on tree remains intensified in various ways after the onset of the Industrial Revolution through multiple actions: deforestation and tillage, excavation of drainage canals, artificial poplar groves, reduction of flow for irrigation purposes, changes in the hydrological regime due to the construction of dams on the Argine, gravel and sand extraction, waste disposal, etc.</p> </div> <p>(****) Please provide a brief description of the most emblematic habitats and species</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 50%;">Please indicate the study area coverage:</td> <td style="width: 15%;"></td> <td style="width: 15%;">The whole area</td> <td style="width: 20%;">100%</td> </tr> <tr> <td> </td> <td>X</td> <td>Partial</td> <td style="background-color: yellow;">indicate %</td> </tr> </table> <p>Evolution of plants landscape map</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 50%;">YES</td> <td style="width: 50%;">NO</td> </tr> <tr> <td>X</td> <td> </td> </tr> </table> <p>Please indicate the level of detail of the information</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 33%;">Bass</td> <td style="width: 33%;">Medium</td> <td style="width: 33%;">High</td> </tr> <tr> <td>X</td> <td> </td> <td> </td> </tr> </table>		X		Nobody	In preparation	Under implementation	In force					Please indicate the study area coverage:		The whole area	100%		X	Partial	indicate %	YES	NO	X		Bass	Medium	High	X		
	X																													
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X																										
X	The whole area	100%																								
	Partial	indicate %																								
YES	NO																									
X																										

Please indicate the level of detail of the information

Bass	Medium	High
	X	

Old	Recent	Updated
		X

Hydrogeological monitoring plan

Nobody	In preparation	Under implementation	In force
X			

Water Quality Monitoring Plan

Nobody	In preparation	Under implementation	In force
X			

A2.5 Wildlife resources

If yes, please describe the level of information available (****)

Entomology - fauna	Ichthyo -fauna	Avifauna	Mammals-fauna
		X	X

The following mammals have been reported: Otter, Badger, Fox, Beech Marten, Weasel, Polecat, and Pipistrelle. The following reptiles have been reported: European Tortoise, European Pond Turtle,

		<p>European Snail , European Deer, Dice Snake, Collared Snake, Common Gecko, Common Warty Gecko, Wall Lizard, and Western Green Lizard. The following amphibians have been reported: Italian Frog, Italian Green Frog, Italian Tree Frog, Common Toad, and European Green Toad. The following fish have been reported: Apennine Bleak, Chub, Eel, Catfish, Carp, Crucian Carp , Grey Mullet, and Sea Bass. The following resident birds are: Claw Warbler , Kentish Plover, Penduline Tit, Reed Warbler, Jay, House Sparrow, Blackbird, Goldfinch, Cetti's Warbler, Eurasian Coot, and Common Moorhen. Here is the passing birdlife: Night Heron , Little Bittern , Black-tailed Godwit, Oystercatcher, Kingfisher, White and Yellow Wagtail, Coot, Herring Gull, Black-headed Gull, Cormorant, Grey Heron, Great Purple Heron, Little Egret, Sea Squill, Aviary Heron, Black-winged Stilt, Curlew, Sandwich Tern, Little Bittern, Bullfinch, Mallard, Pochard, Chaffinch, Starling, Ruff, Little Tern and many others.</p> <p>(****) Please provide a brief description of the most emblematic habitats and species</p> <p>Please indicate the study area coverage:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 50px;"></td> <td style="width: 100px;">The whole area</td> <td style="width: 100px;">100%</td> </tr> <tr> <td style="text-align: center;">X</td> <td>Partial</td> <td style="background-color: yellow;">indicate %</td> </tr> </table> <p>Wildlife cartography</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 50px;">YES</td> <td style="width: 50px;">NO</td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> </tr> </table> <p>Please indicate your knowledge of the conservation status of the species</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="width: 150px;">Directive</th> <th style="width: 50px;">YES</th> <th style="width: 50px;">NO</th> <th style="width: 150px;">Which Species</th> </tr> </thead> <tbody> <tr> <td>92/43/EEC</td> <td></td> <td style="text-align: center;">X</td> <td></td> </tr> <tr> <td>2009/147/EC</td> <td></td> <td style="text-align: center;">X</td> <td></td> </tr> </tbody> </table>		The whole area	100%	X	Partial	indicate %	YES	NO		X	Directive	YES	NO	Which Species	92/43/EEC		X		2009/147/EC		X	
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		<p>Identifying CC impacts on wetlands</p> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="width: 50px; text-align: center;">YES</td> <td style="width: 50px; text-align: center;">NO</td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> </tr> </table> <p>Please specify:</p> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">CC Impacts</th> <th style="width: 40%;">detail</th> </tr> </thead> <tbody> <tr> <td></td> <td style="text-align: center;">high/medium/low</td> </tr> <tr> <td></td> <td style="text-align: center;">high/medium/low</td> </tr> </tbody> </table> <p>Identification of CC adaptation measures on wetlands</p> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="width: 50px; text-align: center;">YES</td> <td style="width: 50px; text-align: center;">NO</td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> </tr> </table> <p>Please specify:</p> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">CC measurement adaptation</th> <th style="width: 40%;">detail</th> </tr> </thead> <tbody> <tr> <td></td> <td style="text-align: center;">high/medium/low</td> </tr> <tr> <td></td> <td style="text-align: center;">high/medium/low</td> </tr> </tbody> </table>	YES	NO		X	CC Impacts	detail		high/medium/low		high/medium/low	YES	NO		X	CC measurement adaptation	detail		high/medium/low		high/medium/low
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A.3	Pilot wetland values	<table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="width: 50px; text-align: center;">X</td> <td>A3.1 Environmental legacy</td> </tr> </table> <p>If yes, please describe the main characteristics of this value (****)</p> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="width: 80%;">Ofanto River boasts a high level of biodiversity. This environment hosts a very large number of different animal and plant species. This favors</td> </tr> </table>	X	A3.1 Environmental legacy	Ofanto River boasts a high level of biodiversity. This environment hosts a very large number of different animal and plant species. This favors																	
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Ofanto River boasts a high level of biodiversity. This environment hosts a very large number of different animal and plant species. This favors																						

		<p>the presence of an exceptional assortment of living species, making it one of the few important areas in the Puglia region from a naturalistic point of view. The presence of molluscs, larvae, insects, and unicellular flora is significant as they constitute the life support in the food chain of mammals, reptiles, amphibians and especially aquatic birds. The plant kingdom is also very rich along the banks, with tall tree species. The wetland , which can be identified as the terminal part of the Ofanto River basin , constitutes a large stopover and wintering area for numerous bird species during the autumn and spring migrations respectively. The position close to the river means that the bird species identified in the Saline area are the same as those present in the lower Ofanto . They are Please report the following areas Natura 2000: IT9110005, IT9110006, IT9120007, IT9120011, IT9120009, IT9110038, IT9150041.</p> <p>(****) Please provide a brief description of the most emblematic habitats and species</p> <p><input checked="" type="checkbox"/> A3.2 Archaeological heritage</p> <p>If yes, please describe the main characteristics of this value</p> <p>The archaeological assets in the air are the following: C.da Discord Toppicelli , Canne della Battaglia, Cerentino , Hypogeum of the Hoplite, Monterisi-Rossignoli Hypogeum , Hypogeum of S. Aloia , Locality of Madonna del Petto, Locality of Moscatello, Locality of Ponte della Lama, Locality of S. Paolo, Locality of S. Sofia, Madonna del Sabato, Masseria Battaglino, Masseria S. Lazzaro, S. Leucio (Roman Cistern), San Vito – Torlazzo , Via della Dogana.</p> <p><input checked="" type="checkbox"/> A3.3 Historical legacy</p> <p>If yes, please describe the main characteristics of this value</p> <p>The historical heritage includes the archaeological heritage mentioned above and the architectural heritage listed below.</p>	
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		<p><input checked="" type="checkbox"/> A3.4 Architectural heritage</p> <p>If yes, please describe the main characteristics of this value</p> <div style="border: 1px solid black; padding: 5px;"> <p>The architectural assets in the area are the following: Masseria Pera di sotto, Villa Giannotti , Masseria Delvecchio, Borgo Montaltino , Masseria Palombara, Masseria San Vincenzo, Masseria Rasciatano , Masseria Antenisi , Masseria Boccuta , Masseria Perazzo , Masseria Cafiero , Masseria Madonna del Petto, Masseria Tittadegna , Masseria Masseriola , Masseria Ceci, Masseria Casalonga , Masseria Tesoro, La Coppicella di Sotto, Masseria Crocifisso, Posta Piana, Masseria Spagnoletti and many others.</p> </div> <p><input type="checkbox"/> A3.5 Ethnological heritage</p> <p>If yes, please describe the main characteristics of this value</p> <div style="border: 1px solid black; padding: 5px;"> <p>(max 500 characters)</p> </div> <p><input checked="" type="checkbox"/> A3.6 Landscape heritage</p> <p>If yes, please describe the main characteristics of this value</p> <div style="border: 1px solid black; padding: 5px;"> <p>The Landscape Assets are the following: Canne della Battaglia visual cone, Castel del Monte visual cone, Minervino Murge visual cone, Roads of landscape value (SP149 BA, SP174 BA, SP43 BA, SP75 EX SS544 FG, SS93, and many others), Panoramic roads (SP231 EX SS98 BA, SP3 BA) and Panoramic points (Spinazzola viewpoint , Canosa viewpoint, Minervino Murge viewpoint, Canne della Battaglia, Monte Guardianello and many others).</p> </div>
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A.4	Main threats and impacts on the biodiversity of the pilot wetland	description from the threat		relevance of the impact		
				Bass	mediu m	high
		Agriculture	Uplift in flood zones, agricultural waste, illegal construction.			X
		Development residential and commercial	ITTA Residential Complex (Thermal Spa, Tourist, Hotel and Residential Complexes)			X
		Energy production and mining	Cave			X
		Transport and service corridors	Lines electric	X		
		Excessive exploitation, persecution and control				
		Edit of land use	Abandonment :		X	
			Intensification :			X
			Other :			
		Intrusions and disturbances humans	Water extraction from the riverbed		X	
		Changes natural system	Illegal cultivation			X
		Invasive species and genes and other problems	<i>Ailanthus altissima</i> , <i>Robinia pseudoacacia L.</i>		X	
		Pollution	Waste agricultural			X
Events geological						
Climate change and adverse weather conditions						
Other	Please specify :					

<p>A.5</p>	<p>governance process for the pilot area</p>	<p>What are the main driving factors for promoting a voluntary governance process like the Wetland Contract in the pilot area? (e.g., why implement a governance process ? Why adopt it as a type of tool?)</p> <div style="border: 1px solid black; padding: 5px;"> <p>The River Contract for the Lower and Middle Ofanto Valley fits perfectly within the "local development" framework introduced by Article 68-bis of the Environmental Code, Legislative Decree 152/2006. The Ofanto River , as a hydrographic territory, is the main environmental element of criticality and potential in the Green New Deal policies. It can represent a new paradigm for the "Development" Contract, integrating planning and programming. It can increasingly assume the role of a preparatory tool and framework for a general strategic framework for financing programs and projects at the river basin scale. The Ofanto River Contract aims to build a medium- to long -term vision for the Valley, in which the elements of its natural, identity-building , and productive heritage, capable of promoting economic development and employment, are enhanced in sustainable, direct, and induced ways throughout its territory and in the surrounding areas of influence.</p> </div> <p>What are the specific objectives and expected outcomes of the Wetland Pilot Area Contract?</p> <div style="border: 1px solid black; padding: 5px;"> <p>The general objectives of the River Contract of the Lower and Middle Ofanto Valley are :</p> <p>1) reducing water pollution and protecting the aquatic environment and related ecosystems; 2) sustainable use of water resources; 3) rebalancing the water balance; 4) redevelopment of the environmental and landscape systems surrounding the river corridors; 5) improving tourism and environmental enjoyment of the river and surrounding areas; 6) coordinating urban planning and development policies in the affected municipalities; 7) sharing information and promoting water culture; 8) coordinating measures to reduce and prevent flood risk; 9) coordinating with specific stakeholders to discuss minimum vital flows and sediment management; 10) building a shared strategic vision for sustainable and sustainable development of the territory, combining recovery of identity, safety, and environmental quality.</p> </div> <p>What could be the role of the Wetland Contract for Pilot Wetland Adaptation to Climate Change?</p>
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		<p>Promoting the reforestation of the wetland, with absorption of CO₂, would contribute to reducing the process of human impact, creating a green lung, currently absent, for the benefit of the populations living in the vicinity of the pilot area, promoting the thermoregulation of the inhabitants in an area that in recent decades has seen the landscape radically transformed, consisting of riparian vegetation , mainly formed by poplar specimens (<i>P. alba</i>, <i>P. nigra</i> , <i>P. canescens</i>).</p>																																									
A6	Automatic assessment of the overall knowledge level for the target area and additional information	<p>How do you assess the level of information regarding the target area?</p> <table border="1"> <tr> <td>Very poor</td> <td>Poor</td> <td>Sufficient</td> <td>Rich</td> <td>Complete</td> </tr> <tr> <td></td> <td>X</td> <td></td> <td></td> <td></td> </tr> </table> <p>How do you evaluate the quality of information related to the target area?</p> <table border="1"> <tr> <td>Very low</td> <td>Bass</td> <td>Sufficient</td> <td>High</td> <td>Very high</td> </tr> <tr> <td></td> <td></td> <td>X</td> <td></td> <td></td> </tr> </table> <p>How do you assess the level of information on CC in relation to the target area?</p> <table border="1"> <tr> <td>Very poor</td> <td>Poor</td> <td>Sufficient</td> <td>Rich</td> <td>Complete</td> </tr> <tr> <td>X</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>How do you evaluate the quality of CC information related to the target area?</p> <table border="1"> <tr> <td>Very low</td> <td>Bass</td> <td>Sufficient</td> <td>High</td> <td>Very high</td> </tr> <tr> <td>X</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Very poor	Poor	Sufficient	Rich	Complete		X				Very low	Bass	Sufficient	High	Very high			X			Very poor	Poor	Sufficient	Rich	Complete	X					Very low	Bass	Sufficient	High	Very high	X					
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		<p>Please describe any additional information you consider relevant that is not already in this report.</p> <div style="border: 1px solid black; padding: 2px;">Study and monitoring of coastal dynamics, Study of coastal erosion.</div> <p>Please describe any additional fields of investigation you consider relevant to the target area to be added.</p> <div style="border: 1px solid black; padding: 2px;">Water quality, coastal protection.</div>
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SCIENTIFIC DESCRIPTION REPORT

Pilot area name: Special Ornithological Reserve Palud - Palù

Partner Name: PP5 NH - Public Institution Natura Histrica

Deliverable 1.2.3 - English summary

date: 19/08/2025

Notes:

This template is inspired by and coordinated with the documentation elaborated in the Interreg Med (2014-2020) WETNET project and the Interreg Italy-Croatia (2014-2020) CREW project.

Authors:

Katarina Perković (Public Institution Natura Histrica)

Sandro Dujmović (Public Institution Natura Histrica)

Notes:

1) please respect the maximum number of characters for each chapter, in order to ensure the homogeneity of the partners' contributions.

Chapter number and name		Contents							
A.1	Pilot wetland ID	<table border="1"> <tr> <td>Name of the pilot wetland</td> <td>Special Ornithological Reserve Palud - Palù</td> </tr> <tr> <td>Country</td> <td>Croatia</td> </tr> <tr> <td>Region/s</td> <td>Istria</td> </tr> </table>		Name of the pilot wetland	Special Ornithological Reserve Palud - Palù	Country	Croatia	Region/s	Istria
Name of the pilot wetland	Special Ornithological Reserve Palud - Palù								
Country	Croatia								
Region/s	Istria								
		Municipality/ies (*)	Number of inhabitants						
		City of Rovinj	13709						
		Total	13709						
		(*) just those one that include (part of) the protected wetland. Please add as many rows you need.							

		<p>Organization/s responsible for the management of the pilot wetland</p>	<p>Name: Public Institution Natura Histrica</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">Public body</td> <td style="width: 10%; text-align: center;">x</td> <td style="width: 25%;">Private</td> <td style="width: 40%;"></td> </tr> </table>	Public body	x	Private							
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		<p>Other entities (Administrations, NGO, etc.) directly involved in the management of the pilot wetland *</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 100%;">Communal Service – communal waste management</td> </tr> <tr> <td>Croatian Waters – maintenance of the canal connecting marsh and the sea</td> </tr> <tr> <td>Croatian Forests – management of the forests</td> </tr> </table>	Communal Service – communal waste management	Croatian Waters – maintenance of the canal connecting marsh and the sea	Croatian Forests – management of the forests							
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		<p>(*) Please add as many rows you need</p>											
		<p>Role of the partner in relation to the pilot area (i.e. development agency, research centre, ...)</p>	<p>Public institution is directly in charge for the nature protection on the regional level and for management of the protected areas, including the pilot area.</p>										
		<p>A1.1 Wetland management plan</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30px; text-align: center;"><input type="checkbox"/></td> <td>foreseen</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>under preparation</td> </tr> <tr> <td style="text-align: center;">x</td> <td>in force</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>under implementation</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>none</td> </tr> </table>	<input type="checkbox"/>	foreseen	<input type="checkbox"/>	under preparation	x	in force	<input type="checkbox"/>	under implementation	<input type="checkbox"/>	none	
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		<p>If present, is CC mentioned amongst pressures?</p> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="width: 50px; text-align: center;">Yes</td> <td style="width: 50px; text-align: center;">No</td> </tr> <tr> <td style="text-align: center;">x</td> <td></td> </tr> </table> <p>If present, is adaptation to CC mentioned amongst management measures?</p> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="width: 50px; text-align: center;">Yes</td> <td style="width: 50px; text-align: center;">No</td> </tr> <tr> <td style="text-align: center;">x</td> <td></td> </tr> </table> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: left;"> <p>A1.2 Wetland typology</p> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="width: 30px; text-align: center;">x</td> <td>marine/coastal (**)</td> </tr> <tr> <td style="text-align: center;"></td> <td>inland (***)</td> </tr> <tr> <td style="text-align: center;"></td> <td>artificial (****)</td> </tr> </table> </div> <div style="text-align: left;"> <p>A1.3 Dominant salinity</p> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="width: 30px; text-align: center;"></td> <td>fresh water</td> </tr> <tr> <td style="text-align: center;">x</td> <td>brackish water</td> </tr> <tr> <td style="text-align: center;"></td> <td>salt water</td> </tr> </table> </div> </div> <p>(**) including estuaries, deltas and costal lagoons (***) including rivers, marshes and peatlands (****) including ponds, wastewater treatment areas, salt exploration sites and aquacultures</p> <p>A1.4 Presence of water</p> <table border="1" style="margin-left: 20px; border-collapse: collapse; width: 100%;"> <tr> <td style="width: 25%; text-align: center;">Permanent</td> <td style="width: 25%; text-align: center;">Seasonal</td> <td style="width: 25%; text-align: center;">Temporary</td> <td style="width: 25%; text-align: center;">Intermittent</td> </tr> <tr> <td style="text-align: center;">x</td> <td></td> <td></td> <td></td> </tr> </table>	Yes	No	x		Yes	No	x		x	marine/coastal (**)		inland (***)		artificial (****)		fresh water	x	brackish water		salt water	Permanent	Seasonal	Temporary	Intermittent	x			
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A.2	Scientific Background	<p>The area has scientific information and data on:</p> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="width: 30px; text-align: center;">x</td> <td>A2.1 Floristic Species</td> </tr> </table> <p>If yes, please describe the level of the available information (****)</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>The largest part of the surface of the swamp is overgrown with <i>Phragmites australis</i>. The flora in the wetland changes throughout the</p> </div>	x	A2.1 Floristic Species																										
x	A2.1 Floristic Species																													

		<p>year, depending on salinity. In the northern, almost freshwater part, there are rare, endangered and protected plants: <i>Ranunculus lingua</i>, <i>R. ophioglossifolius</i>, <i>Cyperus longus</i>, <i>Lemna gibba</i>, <i>Wolffia arrhiza</i>. On the seashore, there is a characteristic halophile reef vegetation with endangered species <i>Glaucium flavum</i>.</p> <p>(*****) please provide a short description of the most emblematic habitat and species</p> <p>Please indicate the study surface coverage:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 50%;"></td> <td style="width: 50%;"></td> </tr> <tr> <td>Partial</td> <td>50-60 %</td> </tr> </table> <p>Floristic map</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 50%;">Yes</td> <td style="width: 50%;">No</td> </tr> <tr> <td></td> <td style="text-align: center;">x</td> </tr> </table> <p>Please indicate the detail level of the information</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 33%;">Low</td> <td style="width: 33%;">Medium</td> <td style="width: 33%;">High</td> </tr> <tr> <td></td> <td style="text-align: center;">x</td> <td></td> </tr> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 33%;">Old</td> <td style="width: 33%;">Recent</td> <td style="width: 33%;">Up-to-date</td> </tr> <tr> <td></td> <td style="text-align: center;">x</td> <td></td> </tr> </table> <p>Floristic monitoring plan</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 25%;">None</td> <td style="width: 25%;">Under preparation</td> <td style="width: 25%;">Under implementation</td> <td style="width: 25%;">In force</td> </tr> <tr> <td style="text-align: center;">x</td> <td></td> <td></td> <td></td> </tr> </table> <p><input checked="" type="checkbox"/> A2.2 Vegetation</p>			Partial	50-60 %	Yes	No		x	Low	Medium	High		x		Old	Recent	Up-to-date		x		None	Under preparation	Under implementation	In force	x			
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x																														

		<p>If yes, please describe the level of the available information (****)</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>Phytogeographically, Palud is situated in the eumediterranean vegetation belt, characterised by a combination of forest and shrubs of holm oak (<i>Quercus ilex</i>) and manna ash (<i>Fraxinus ornus</i>). Considering that the vegetation of the sub-mediterranean belt descends at some parts of the western Istrian coast all the way to the sea level where human influence is greatly felt, there is a mixture of degradation forms around the wetland. The most specific habitat of the wetland itself is classified as coastal lagoon (1500).</p> </div> <p>(****) please provide a short description of the most emblematic habitat and species</p> <p>Please indicate the study surface coverage:</p> <table border="1" style="float: right; margin-left: auto; margin-right: 0;"> <tr> <td style="width: 100px;">Whole area</td> <td style="width: 100px;">100%</td> </tr> <tr> <td> </td> <td> </td> </tr> </table> <p>Vegetation map</p> <table border="1" style="margin-left: auto; margin-right: 0;"> <tr> <td style="width: 50px;">Yes</td> <td style="width: 50px;">No</td> </tr> <tr> <td> </td> <td style="text-align: center;">x</td> </tr> </table> <p>Habitat map (sensu 92/43 EEC)</p> <table border="1" style="margin-left: auto; margin-right: 0;"> <tr> <td style="width: 50px;">Yes</td> <td style="width: 50px;">No</td> </tr> <tr> <td style="text-align: center;">x</td> <td> </td> </tr> </table> <p>Please indicate the detail level of the information</p> <table border="1" style="margin-left: auto; margin-right: 0; margin-bottom: 10px;"> <tr> <td style="width: 33%;">Low</td> <td style="width: 33%;">Medium</td> <td style="width: 33%;">High</td> </tr> <tr> <td> </td> <td style="text-align: center;">x</td> <td> </td> </tr> </table> <table border="1" style="margin-left: auto; margin-right: 0;"> <tr> <td style="width: 33%;">Old</td> <td style="width: 33%;">Recent</td> <td style="width: 33%;">Up-to-date</td> </tr> <tr> <td> </td> <td style="text-align: center;">x</td> <td> </td> </tr> </table>	Whole area	100%			Yes	No		x	Yes	No	x		Low	Medium	High		x		Old	Recent	Up-to-date		x	
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		<p>Vegetation monitoring plan</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <th style="width: 25%;">None</th> <th style="width: 25%;">Under preparation</th> <th style="width: 25%;">Under implementation</th> <th style="width: 25%;">In force</th> </tr> <tr> <td style="text-align: center;">x</td> <td></td> <td></td> <td></td> </tr> </table> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <table style="width: 100%;"> <tr> <td style="width: 5%; text-align: center; border: 1px solid black;">x</td> <td>A2.3 Evolution of vegetal landscape</td> </tr> </table> </div> <p>If yes, please describe the level of the available information (*****)</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>Pollen analysis shows that until 2200 years ago Palud was a typical freshwater marsh (Nymphaea, Utricularia, Myriophyllum, Alisma). After that, marine transgression occurred, and species more tolerant to higher salinity started to appear (Ruppia, Zanichellia). Human influence started 2200 years ago - rapid decline of pollen of forest species and increase in pollen of cultivated species. From early middle age there is an increase in pollen of species connected to degradation by grazing.</p> </div> <p>(*****) please provide a short description of the most emblematic habitat and species</p> <p>Please indicate the study surface coverage:</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-left: auto; margin-right: auto;"> <tr> <td style="width: 50%;">Whole area</td> <td style="width: 50%;">100%</td> </tr> <tr> <td> </td> <td> </td> </tr> </table> <p>Evolution of vegetal landscape map</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-left: auto; margin-right: auto;"> <tr> <td style="width: 50%;">Yes</td> <td style="width: 50%;">No</td> </tr> <tr> <td> </td> <td style="text-align: center;">x</td> </tr> </table> <p>Please indicate the detail level of the information</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-left: auto; margin-right: auto; margin-bottom: 10px;"> <tr> <td style="width: 33%;">Low</td> <td style="width: 33%;">Medium</td> <td style="width: 33%;">High</td> </tr> <tr> <td> </td> <td style="text-align: center;">x</td> <td> </td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse; margin-left: auto; margin-right: auto;"> <tr> <td style="width: 33%;">Old</td> <td style="width: 33%;">Recent</td> <td style="width: 33%;">Up-to-date</td> </tr> </table>	None	Under preparation	Under implementation	In force	x				x	A2.3 Evolution of vegetal landscape	Whole area	100%			Yes	No		x	Low	Medium	High		x		Old	Recent	Up-to-date
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		x			
Vegetal Landscape monitoring plan					
		None	Under preparation	Under implementation	In force
		x			
		x	A2.4 Hydro-geological resources		
If yes, please describe the level of the available information (*****)					
<p>Palud is a natural depression in the karst landscape south of Rovinj. It is fed by rainwater runoff from surrounding hills and plateaus, as well as by freshwater springs on its northern side. In 1906 a 200-meter canal was dug, linking the wetland with the sea. This canal allows the inflow of seawater, creating a brackish environment. The wetland's surface area fluctuates significantly depending on inflow and evaporation: 20 hectares in the rainy season, 2 hectares in dry periods. The area oscillates between mesotrophic and eutrophic conditions dependant on the tides. Hydrological survey showed that the wetland is exposed to intensive periodical changes of hydrographical conditions uncommon for Northern Adriatic. Temperature of the wetland is 1-2°C higher than the surrounding sea.</p> <p>The water is a mixture of freshwater and seawater, with marked salinity gradients. Physico-chemical studies show dynamic mixing processes that strongly shape local ecosystems. Sedimentation in the central part of the wetland consist of sludge with low percentage of oxygen and extremely high percentage of organic material (33.6%) likely due to decaying plant matter, algae and other aquatic organisms, primary and secondary production of the wetland, and forest soil leaching. As the system is highly variable and sensitive, monitoring and maintaining stable water levels and quality is essential for conservation of the reserve.</p>					

(****) please provide a short description of the most emblematic habitat and species

Please indicate the study surface coverage:

Whole area	100%

Hydrogeological cartography

Yes	No
	x

Please indicate the detail level of the information

Low	Medium	High
	x	

Old	Recent	Up-to-date
	x	

Hydro-geological monitoring plan

None	Under preparation	Under implementation	In force
		x	

Quality of Water monitoring plan

None	Under preparation	Under implementation	In force
	x		

		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%; text-align: center; vertical-align: top;">x</td> <td colspan="3" style="text-align: left;">A2.5 Faunistic resources</td> </tr> <tr> <td colspan="4" style="text-align: left; padding-top: 10px;">If yes, please describe the level of the available information (*****)</td> </tr> <tr> <td style="width: 25%;"></td> <td style="width: 25%;"></td> <td style="width: 25%;"></td> <td style="width: 25%;"></td> </tr> <tr> <td style="text-align: center;">Entomo-fauna</td> <td style="text-align: center;">Ichthyo-fauna</td> <td style="text-align: center;">Avi-fauna</td> <td style="text-align: center;">Mammalo-fauna</td> </tr> <tr> <td style="text-align: center;">x</td> <td style="text-align: center;">x</td> <td style="text-align: center;">x</td> <td style="text-align: center;">x</td> </tr> </table> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p>Avifauna is monitored frequently and a bird ringing camp is organised on a yearly basis. 235 species of birds have been recorded so far. Palud is a valuable breeding site for Black-winged Stilts (<i>Himantopus himantopus</i>), Shelduck (<i>Tadorna tadorna</i>), and Common Tern (<i>Sterna hirundo</i>). It is an important stop-over area for migratory birds (<i>Phoenicopterus ruber</i>, <i>Pandion haliaeetus</i>, <i>Plegadis falcinellus</i>, Charadriidformes, Ardeidea, Passeriformes, Laridea, etc.). Along with water birds, an abundance of forest and grassland species is also present.</p> <p>Other groups of fauna are not systematically surveyed, but recent surveys were done on entomofauna and ichthyofauna. Furthermore, the institution has wildlife trail cameras which are used as needed for monitoring of mammals.</p> <p>A total of 39 butterfly (Rhopalocera) and 71 moth (Heterocera) species were recorded, which indicates the importance of the site as a Lepidoptera habitat. 51 species of beetles (Coleoptera) with two near-threatened (NT) species (<i>Protaetia aeruginosa</i>, <i>Lucanus cervus</i>) were recorded in recent surveys. Recent surveying also shows presence of nine dragonfly (Odonata) species, while historic records list 12 dragonfly species found in the area.</p> <p>Ichthyo-fauna surveying results showed the presence of at least seven species of fish, but there are likely more (<i>Anguilla nguilla</i>, <i>Chelon auratus</i>, <i>Sparus aurata</i>, <i>Chelon saliens</i>, <i>Mugil cephalus</i>, <i>Conger conger</i>), including the invasive Eastern mosquitofish (<i>Gambusia holbrooki</i>).</p> </div>	x	A2.5 Faunistic resources			If yes, please describe the level of the available information (*****)								Entomo-fauna	Ichthyo-fauna	Avi-fauna	Mammalo-fauna	x	x	x	x
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x	x	x	x																			

		<p>Mammalo-fauna include foxes, white-breasted hedgehogs, shrews, red squirrels, field and forest mice, dormice, weasels, martens, wild boars, roe deer and four species of bats.</p> <p>Presence of an invasive rodent species nutria (<i>Myocastor coypus</i>) was recorded, and its removal and population control plan are under preparation.</p> <p>(****) please provide a short description of the most emblematic habitat and species</p> <p>Please indicate the study surface coverage:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 60%;">Whole area</td> <td style="width: 40%;">100%</td> </tr> <tr> <td> </td> <td> </td> </tr> </table> <p>Faunistic cartography</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 50%;">Yes</td> <td style="width: 50%;">No</td> </tr> <tr> <td> </td> <td style="text-align: center;">x</td> </tr> </table> <p>Please indicate the knowledge on the conservation status of species</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="width: 25%;">Directive</th> <th style="width: 10%;">Yes</th> <th style="width: 10%;">No</th> <th style="width: 55%;">Which Species</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">92/43/EEC</td> <td style="text-align: center;">x</td> <td> </td> <td style="text-align: center;"><i>Elaphe quatuorlineata</i>, <i>Emys orbicularis</i>, <i>Testudo hermanni</i></td> </tr> <tr> <td style="text-align: center;">2009/147/EC</td> <td style="text-align: center;">x</td> <td> </td> <td style="text-align: center;">61*</td> </tr> </tbody> </table> <p><small>* <i>Gavia stellata</i>, <i>Gavia arctica</i>, <i>Phalacrocorax aristotelis</i>, <i>Phalacrocorax pygmeus</i>, <i>Botaurus stellaris</i>, <i>Ixobrychus minutus</i>, <i>Ardeola ralloides</i>, <i>Nycticorax nycticorax</i>, <i>Egretta alba</i>, <i>Egretta garzetta</i>, <i>Ardea purpurea</i>, <i>Platalea leucorodia</i>, <i>Plegadis falcinellus</i>, <i>Ciconia ciconia</i>, <i>Ciconia nigra</i>, <i>Phoenicopiterus ruber</i>, <i>Anser erythropus</i>, <i>Aythya nyroca</i>, <i>Pandion haliaetus</i>, <i>Milvus migrans</i>, <i>Milvus milvus</i>, <i>Circaetus gallicus</i>, <i>Circus aeruginosus</i>, <i>Circus cyaneus</i>, <i>Circus pygargus</i>, <i>Pernis apivorus</i>, <i>Falco peregrinus</i>, <i>Falco columbarius</i>, <i>Porzana porzana</i>, <i>Porzana parva</i>, <i>Grus grus</i>, <i>Himantopus himantopus</i>, <i>Recurvirostra avosetta</i>, <i>Charadrius alexandrinus</i>, <i>Pluvialis apricaria</i>, <i>Philomachus pugnax</i>, <i>Limosa lapponica</i>, <i>Tringa glareola</i>, <i>Xenus cinereus</i>, <i>Larus genei</i>, <i>Larus minutus</i>, <i>Larus melanocephalus</i>, <i>Geochelidon nilotica</i>, <i>Sterna hirundo</i>, <i>Sterna albifrons</i>, <i>Thalasseus sandvicensis</i>, <i>Chlidonias niger</i>, <i>Chlidonias hybridus</i>, <i>Asio flammeus</i>, <i>Caprimulgus europaeus</i>, <i>Alcedo atthis</i>, <i>Dendrocopos medius</i>, <i>Lullula arborea</i>, <i>Calandrella brachydactyla</i>, <i>Anthus campestris</i>, <i>Luscinia svecica</i>, <i>Acrocephalus melanopogon</i>, <i>Ficedula albicollis</i>, <i>Lanius minor</i>, <i>Lanius collurio</i>, <i>Emberiza hortulana</i>.</small></p> <p>Please indicate the detail level of the information</p>	Whole area	100%			Yes	No		x	Directive	Yes	No	Which Species	92/43/EEC	x		<i>Elaphe quatuorlineata</i> , <i>Emys orbicularis</i> , <i>Testudo hermanni</i>	2009/147/EC	x		61*
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2009/147/EC	x		61*																			

		Low	Medium	High
				x

Old	Recent	Up-to-date
		x

Faunistic monitoring plan

None	Under preparation	Under implementation	In force
			X (for some species)

x	A2.6 Impacts of CC on wetland management
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Identification of CC pressures on wetland

Yes	No
x	

Please specify:

CC pressure	detail
Increase in water temperature	high
Droughts/floods	high
Extreme weather conditions	high
Invasive species	high

Identification of CC impacts on wetland

Yes	No
x	

Please specify:

		<table border="1"> <thead> <tr> <th>CC impacts</th> <th>detail</th> </tr> </thead> <tbody> <tr> <td>Increase in water temperature</td> <td>high</td> </tr> <tr> <td>Droughts/floods</td> <td>high</td> </tr> <tr> <td>Extreme weather conditions</td> <td>medium</td> </tr> <tr> <td>Invasive species</td> <td>high</td> </tr> </tbody> </table> <p>Identification of CC adaptation measures on wetland</p> <table border="1"> <thead> <tr> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>x</td> <td></td> </tr> </tbody> </table> <p>Please specify:</p> <table border="1"> <thead> <tr> <th>CC adaptation measure</th> <th>detail</th> </tr> </thead> <tbody> <tr> <td>Installation of a mechanical sluice gate to control the water flow between the wetland and the sea through the existing channel</td> <td>high</td> </tr> <tr> <td>Installation of environmental sensors for monitoring water conditions</td> <td>high</td> </tr> <tr> <td>Invasive species population control and removal</td> <td>high</td> </tr> </tbody> </table>	CC impacts	detail	Increase in water temperature	high	Droughts/floods	high	Extreme weather conditions	medium	Invasive species	high	Yes	No	x		CC adaptation measure	detail	Installation of a mechanical sluice gate to control the water flow between the wetland and the sea through the existing channel	high	Installation of environmental sensors for monitoring water conditions	high	Invasive species population control and removal	high
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A.3	Values of the pilot wetland	<table border="1"> <tr> <td>x</td> <td>A3.1 Environmental heritage</td> </tr> </table> <p>If yes, please describe the main features of this value (****)</p> <div style="border: 1px solid black; padding: 5px;"> <p>Specific habitats for the ornithological reserves include Coastal lagoon (1150), Annual vegetation of drift lines (1210) and Mediterranean salt meadows (<i>Juncetalia maritimi</i>) (1410). Palud is very valuable and specific because it is a rare habitat type in predominantly karst areas of the Croatian Adriatic coast and wider area of Dinarides. In recent years some bird species which rarely nest in Croatia started to nest here (<i>Himantopus himantopus</i>, <i>Tadorna tadorna</i>). There are also trace fossils (imprints of dinosaur steps) on the coast.</p> </div>	x	A3.1 Environmental heritage																				
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		<p>(****) please provide a short description of the most emblematic habitat and species</p> <p><input checked="" type="checkbox"/> A3.2 Archaeological heritage</p> <p>If yes, please describe the main features of this value</p> <div style="border: 1px solid black; padding: 5px;"> <p>Early human presence is well documented in Palud area. Remains of settlements dated as far as Bronze and Iron Age are found on almost each hilltop in the vicinity of the wetland.</p> </div> <p><input checked="" type="checkbox"/> A3.3 Historical heritage</p> <p>If yes, please describe the main features of this value</p> <div style="border: 1px solid black; padding: 5px;"> <p>There is a well-preserved cistern in Bačvice Bay as well as remnants of numerous Roman villas. Remnants of the St. Damian church were found near the wetland. The little church was a simple building built between 11th and 12th century.</p> </div> <p><input type="checkbox"/> A3.4 Architectonical heritage</p> <p>If yes, please describe the main features of this value</p> <div style="border: 1px solid black; padding: 5px;"> <p>(max 500 characters)</p> </div> <p><input checked="" type="checkbox"/> A3.5 Ethnological heritage</p> <p>If yes, please describe the main features of this value</p>
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		<p>Traditional fishing of eels was recorded in the area, but this custom is no longer practiced.</p>	<p>There was tradition present.</p>																																																																							
		<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <input checked="" type="checkbox"/> A3.6 Landscape heritage </div> <p>If yes, please describe the main features of this value</p> <div style="border: 1px solid black; padding: 5px;"> <p>Palud belongs to a wider nationally protected area (Significant landscape "Rovinjski otoci i priobalno područje") which has a high aesthetic value. It is characterised by a dense vegetation of pines, cedars and cypresses, and shrubs of holm oak, while indented rocky coast is characterised by numerous islets, capes and bays.</p> </div>																																																																								
<p>A.4</p>	<p>Main threats and impacts for the biodiversity of the pilot wetland</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" rowspan="2">description of the threat</th> <th colspan="3">relevance of the impact</th> </tr> <tr> <th>low</th> <th>medium</th> <th>high</th> </tr> </thead> <tbody> <tr> <td colspan="2">Agriculture</td> <td style="text-align: center;">x</td> <td></td> <td></td> </tr> <tr> <td colspan="2">Residential & commercial development</td> <td style="text-align: center;">x</td> <td></td> <td></td> </tr> <tr> <td colspan="2">Energy production & mining</td> <td style="text-align: center;">x</td> <td></td> <td></td> </tr> <tr> <td colspan="2">Transportation & service corridors</td> <td style="text-align: center;">x</td> <td></td> <td></td> </tr> <tr> <td colspan="2">Over-exploitation, persecution & control</td> <td style="text-align: center;">x</td> <td></td> <td></td> </tr> <tr> <td rowspan="3" style="vertical-align: middle;">Land use modification</td> <td>Abandonment</td> <td></td> <td style="text-align: center;">x</td> <td></td> </tr> <tr> <td>Intensification</td> <td style="text-align: center;">x</td> <td></td> <td></td> </tr> <tr> <td>Other</td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="2">Human intrusions & disturbance</td> <td></td> <td></td> <td style="text-align: center;">x</td> </tr> <tr> <td colspan="2">Natural system modifications</td> <td style="text-align: center;">x</td> <td></td> <td></td> </tr> <tr> <td colspan="2">Invasive & other problematic species & genes</td> <td></td> <td></td> <td style="text-align: center;">x</td> </tr> <tr> <td colspan="2">Pollution</td> <td></td> <td></td> <td style="text-align: center;">x</td> </tr> <tr> <td colspan="2">Geological events</td> <td style="text-align: center;">x</td> <td></td> <td></td> </tr> </tbody> </table>	description of the threat		relevance of the impact			low	medium	high	Agriculture		x			Residential & commercial development		x			Energy production & mining		x			Transportation & service corridors		x			Over-exploitation, persecution & control		x			Land use modification	Abandonment		x		Intensification	x			Other				Human intrusions & disturbance				x	Natural system modifications		x			Invasive & other problematic species & genes				x	Pollution				x	Geological events		x			
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		Climate change & severe weather			X
		Other	Please specify:		
A.5	Main reasons and expectations that underpin the governance process for the pilot area	<p>What are the main drivers for promoting a voluntary governance process like a Wetland Contract in the pilot area? (i.e. why to implement a governance process? why to adopt such kind of tool?)</p> <div style="border: 1px solid black; padding: 5px;"> <p>Wetland Contract is an appropriate tool for achieving the satisfactory level of biodiversity protection of a fragile wetland ecosystem due to several reasons:</p> <ul style="list-style-type: none"> - A useful tool for achieving active involvement of stakeholders in the process of decision making and/or management of the area. - Raising awareness for locals and visitors of natural values that exist in their immediate vicinity. - Public Institution is not adequately equipped for all management tasks, especially those concerning impacts of climate change. </div> <p>What are the specific objectives and expected results from the Wetland Contract of the pilot area?</p> <div style="border: 1px solid black; padding: 5px;"> <p>From the process of development and further implementation of the Wetland Contract we expect the following:</p> <ul style="list-style-type: none"> - Active involvement of all stakeholders that are directly related to the area - Continuous co-operation of the Public Institution and stakeholders - Better maintained area of the ornithological reserve - Development of high quality educational and tourist packages - Development of managing tools aimed at combating the climate change threats and impacts. </div> <p>Which might be the role of the Wetland Contract for adaptation of pilot wetland to Climate Change?</p> <div style="border: 1px solid black; padding: 5px;"> <p>Palud's hydrological balance depends on rainfall, freshwater springs, and water inflow/outflow through the channel. With climate change bringing increased droughts, erratic rainfall, sea-level rise, and invasive species, coordinated management is essential. The Wetland</p> </div>			

		<p>Contract enables development of tools and coordination necessary for regulation water inflow, monitoring salinity and preventing habitat degradation.</p> <p>Historically, stakeholders were not actively involved in Palud’s management and public awareness of climate change problems is low. Through the Contract, local communities, institutions, and visitors can be engaged in safeguarding the wetland and educated on importance of wetland management.</p> <p>The Wetland Contract provides a framework for creating management instruments that directly address climate impacts, such as:</p> <ul style="list-style-type: none"> - adaptive water-level management, - water quality control strategies, - habitat restoration. <p>By linking conservation with high-quality educational and ecotourism initiatives, the Contract increases both awareness and funding streams for climate adaptation measures.</p> <p>Since the Public Institution managing Palud is not fully equipped to handle climate-related challenges, the Contract ensures shared responsibility and continuous cooperation with stakeholders, strengthening resilience at the governance level.</p>																				
A6	Auto evaluation of the global knowledge level for the target area and additional information	<p>How do you evaluate the level of information regarding the target area?</p> <table border="1"> <tr> <td>Very poor</td> <td>Poor</td> <td>Sufficient</td> <td>Rich</td> <td>Complete</td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;">x</td> <td></td> <td></td> </tr> </table> <p>How do you evaluate the quality of information regarding the target area?</p> <table border="1"> <tr> <td>Very low</td> <td>Low</td> <td>Sufficient</td> <td>High</td> <td>Very high</td> </tr> <tr> <td></td> <td></td> <td></td> <td style="text-align: center;">x</td> <td></td> </tr> </table> <p>How do you evaluate the level of information on CC regarding the target area?</p>	Very poor	Poor	Sufficient	Rich	Complete			x			Very low	Low	Sufficient	High	Very high				x	
Very poor	Poor	Sufficient	Rich	Complete																		
		x																				
Very low	Low	Sufficient	High	Very high																		
			x																			

		Very poor	Poor	Sufficient	Rich	Complete
			x			
<p>How do you evaluate the quality of information on CC regarding the target area?</p>						
		Very low	Low	Sufficient	High	Very high
				x		
<p>Please describe additional information you consider relevant not already in this report</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>So far 14 species of reptiles and three species of amphibians were recorded, including the nationally protected European pond turtle (<i>Emys orbicularis</i>).</p> <p>The highly invasive blue crab (<i>Callinectes sapidus</i>) has been recorded in great numbers in the wetland, the sea, and the channel connecting the wetland to the sea. Population control and removal efforts are currently underway.</p> </div> <p>Please describe additional field of investigation you consider relevant for the target area to be added</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>Additional fine-scale research of water parameters, flora, fauna and hydrology is needed.</p> </div>						

SCIENTIFIC DESCRIPTION

REPORT

Pilot area name: Delta River Neretva

Partner Name: PP6 PINDC - Public Institution Dubrovnik-Neretva County
Nature

Deliverable 1.2.3 - English summary

date: 11/07/2025

Notes:

This template is inspired by and coordinated with the documentation elaborated in the Interreg Med (2014-2020) WETNET project and the Interreg Italy-Croatia (2014-2020) CREW project.

Authors:

Nikolina Đangradović (Public Institution Dubrovnik-Neretva County Nature)

Notes:

- 1) please respect the maximum number of characters for each chapter, in order to ensure the homogeneity of the partners' contributions.

Chapter number and name		Contents																			
A.1	Pilot wetland ID	<table border="1"> <tr> <td>Name of the pilot wetland</td> <td>Neretva River Delta</td> </tr> <tr> <td>Country</td> <td>Dubrovnik-Neretva County</td> </tr> <tr> <td>Region/s</td> <td>Dalmatia, Southern Croatia</td> </tr> </table>		Name of the pilot wetland	Neretva River Delta	Country	Dubrovnik-Neretva County	Region/s	Dalmatia, Southern Croatia												
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		<p>Organization/s responsible for the management of the pilot wetland</p>	<p>Name: Public Institution for the Management of Protected Natural Areas of Dubrovnik-Neretva County</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">Public body</td> <td style="width: 10%; text-align: center;">X</td> <td style="width: 25%;">Private</td> <td style="width: 40%;"></td> </tr> </table>	Public body	X	Private							
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		<p>A1.1 Wetland management plan</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40px; text-align: center;"><input type="checkbox"/></td> <td>foreseen</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>under preparation</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>in force</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>under implementation</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>none</td> </tr> </table>	<input type="checkbox"/>	foreseen	<input type="checkbox"/>	under preparation	<input checked="" type="checkbox"/>	in force	<input type="checkbox"/>	under implementation	<input type="checkbox"/>	none	
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A.2	Scientific Background	<p>The area has scientific information and data on:</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <td style="width: 5%; text-align: center;">X</td> <td>A2.1 Floristic Species</td> </tr> </table> <p>If yes, please describe the level of the available information (****)</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Water and wetland communities are the basic ecosystems in the Neretva Delta, comprised of the Kuti, Modro oko and Bacinska Lakes, the Norin spring and Hutovo Blato Nature Park with their connecting canals. The basic factor influencing the vegetation types is the level</p> </div>	X	A2.1 Floristic Species																										
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		<p>of groundwater. It is interesting that the wetland vegetation does not differ much from the continental wetlands, despite the strong Mediterranean influence. Wetland communities are dominated by plant species having eurosiberian and holarctic range. The plant community Scirpo-Phragmitetum represents the largest part of wetland vegetation. Myriophyllo-Nupharetum and Nymphoidetum-peltatae are also common communities. The plant association Fimbristylion dichotomae can today be found only in fragments, due to disappearance caused largely by land reclamation. On the mud flats in the Neretva estuary, there are halophytic meadows of the type Salicornietum herbaceae. Grazed meadows near the sea are more or less saline, covered by Juncetum maritimo-acuti and grassland of the Agropyro-Rumicion type. Although the habitats have been significantly altered, the Neretva Delta still represents the largest and the most valuable remains of Mediterranean wetlands in both Croatia and Bosnia and Herzegovina, giving it significant value for the entire Mediterranean region. There is a wealth of data on the flora and vegetation of the Hutovo Blato region, though these data suffer from a lack of detailed information prior to the construction of hydropower plants in the 1960s. Current surveys have catalogued just over 700 species of ferns and other vascular plants throughout the park. Of algae, the genera Nitella and Chara are common members of water plant communities. Fontinalis antipyretica is the most frequent moss in communities found along the path of the area's cold springs. Most plant species found in the park belong to typical Mediterranean floral elements. Terrophytes, annuals requiring a single summer from germination to seed and using a shortened vegetation period, are the dominant type. The most numerous families of these are grasses (fam. Poaceae), legumes (fam. Fabaceae), and asters (fam. Asteraceae and Cichoriaceae), all of which confirm the flora's Mediterranean character. Euhydrophytes dominate among the aquatic plants. These include both submerged plants and those rooted in the riverbed, with vegetative organs developing either in upper water layers or on the water surface itself. Twenty-eight plant species in Hutovo Blato have been added to Bosnia and Herzegovina's List of Rare, Endangered, and Endemic Plant Species in 1994. The largest number of these (22) is classified as vulnerable (V). Another five – three of which are endemic – are categorised as rare (R). Plants in this last group are usually members of small populations that have not been endangered yet, but that may not be far from being so. Water purslane (<i>Ludwigia palustris</i>) is the sole</p>
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		<p>endangered species (E). This means that it is threatened with extinction should its habitat continue to be subject to deleterious factors which, in this case, is primarily reduction of water flow and subsequent habitat drying up (Jasprica,2009).</p> <p>(****) please provide a short description of the most emblematic habitat and species</p> <p>Please indicate the study surface coverage:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Whole area</td> <td>100%</td> </tr> <tr> <td>Partial</td> <td>50 %</td> </tr> </table> <p>Floristic map</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Yes</td> <td>No</td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> </tr> </table> <p>Please indicate the detail level of the information</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Low</td> <td>Medium</td> <td>High</td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;">X</td> </tr> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Old</td> <td>Recent</td> <td>Up-to-date</td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;">X</td> </tr> </table> <p>Floristic monitoring plan</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>None</td> <td>Under preparation</td> <td>Under implementation</td> <td>In force</td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> </tr> </table> <p><input checked="" type="checkbox"/> A2.2 Vegetation</p>	Whole area	100%	Partial	50 %	Yes	No		X	Low	Medium	High			X	Old	Recent	Up-to-date			X	None	Under preparation	Under implementation	In force		X		
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		X																												
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	X																													

If yes, please describe the level of the available information (*****)

In the Neretva Delta, there are eumediterranean, submediterranean and Mediterranean-mountainous vegetation and climatic belts. The Mediterranean climate penetrates into the mainland up the Neretva Valley, enabling the dispersal of eumediterranean and submediterranean flora and fauna elements far inland. The opposite also occurs: species with a continental range, especially those with a preference for wetland habitats, are dispersed towards the coast.

(*****) please provide a short description of the most emblematic habitat and species

Please indicate the study surface coverage:

Whole area	100%
Partial	50 %

Vegetation map

Yes	No
	X

Habitat map (sensu 92/43 EEC)

Yes	No
X	

Please indicate the detail level of the information

Low	Medium	High
	X	

Old	Recent	Up-to-date
	X	

Vegetation monitoring plan

	None	Under preparation	Under implementation	In force																				
		X																						
<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <input checked="" type="checkbox"/> A2.3 Evolution of vegetal landscape </div> <p>If yes, please describe the level of the available information (*****)</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Due to its specific location, climate, complex water regime, etc., the Neretva Delta has high diversity of habitats, especially aquatic and wetland: lakes and ponds, rivers, reedbeds, wetland meadows, poplar and willow forests, marine shore and rocky slopes with ancient forests and various types of degraded rocky habitats. Also, there are many man-made habitats, such as hay meadows, agricultural fields, citrus orchards and vineyards, canals, dams and dykes. </div> <p>(*****) please provide a short description of the most emblematic habitat and species</p> <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 60%;"> <p>Please indicate the study surface coverage:</p> </div> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 5px;">Whole area</td> <td style="padding: 5px;">100%</td> </tr> <tr> <td style="padding: 5px;">Partial</td> <td style="padding: 5px;">50 %</td> </tr> </table> </div> <p>Evolution of vegetal landscape map</p> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 5px;">Yes</td> <td style="padding: 5px;">No</td> </tr> <tr> <td style="padding: 5px;"></td> <td style="padding: 5px;">X</td> </tr> </table> <p>Please indicate the detail level of the information</p> <table border="1" style="border-collapse: collapse; text-align: center; margin-bottom: 10px;"> <tr> <td style="padding: 5px;">Low</td> <td style="padding: 5px;">Medium</td> <td style="padding: 5px;">High</td> </tr> <tr> <td style="padding: 5px;"></td> <td style="padding: 5px;"></td> <td style="padding: 5px;"></td> </tr> </table> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 5px;">Old</td> <td style="padding: 5px;">Recent</td> <td style="padding: 5px;">Up-to-date</td> </tr> <tr> <td style="padding: 5px;">X</td> <td style="padding: 5px;"></td> <td style="padding: 5px;"></td> </tr> </table>	Whole area	100%	Partial	50 %	Yes	No		X	Low	Medium	High				Old	Recent	Up-to-date	X						
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Old	Recent	Up-to-date																						
X																								

		<p>Vegetal Landscape monitoring plan</p> <table border="1"> <thead> <tr> <th>None</th> <th>Under preparation</th> <th>Under implementation</th> <th>In force</th> </tr> </thead> <tbody> <tr> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> </tr> </tbody> </table> <p> <input checked="" type="checkbox"/> A2.4 Hydro-geological resources </p> <p> If yes, please describe the level of the available information (*****) </p> <div style="border: 1px solid black; padding: 5px;"> <p>Neretva Delta in general geotectonic division is classified as external Dinarides. There are three morphological parts: the karst area of the delta, lowland area of the delta and the coastal strip (Nature Park Neretva Delta, 2007). Karst framework is characterized by a sudden change of slope and rock types, as well as frequent cave sinkholes and cracks. Neretva River and its delta is dominated at this area; delta area is composed of three triangular extensions that are tectonically predisposed, it was created as a result of tectonic movements during the last orogenic phases; delta took current form after the transgression of sea 10 000 years ago. Two of those extensions are in Croatia. Sediments of Mesozoic and Cenozoic age build karst frame of the delta Neretva. For the most part these are Cretaceous sediments limestone and dolomite. The oldest and least frequent layers belong to the Upper Triassic. Southwest of Metković is represented by organic - swamp sediments, and west of the Opuzen to the river mouth are represented by Delta sediment, sand, gravel and sand - clay material. The coastal strip is built of Paleogene deposits, Jurassic and Triassic ageis, and is stretching from the northwest to southeast. Mesozoic rocks that make up the increased perimeter of the delta were created in the geological past in the area which we call Adriatic carbonate platform (Nature Park Neretva Delta, 2007). Neretva originates southeast of Zelengora at an altitude of 1095 m, mainly flows through Bosnia and Herzegovina, and flows into the Adriatic Sea south of Ploče. It is about 218 km long, out of which in Croatia 22.3 km (Juračić, 1998). In the upper and middle part of the flow Neretva river is representing a typical mountain passing narrow valleys with steep slopes. River has many tributaries that flow into the main water stream directly or indirectly underground karst flows</p> </div>	None	Under preparation	Under implementation	In force		X		
None	Under preparation	Under implementation	In force							
	X									

		<p>(Margeta, Fistanić, 2000). Large amounts of water come in the delta area through sources which are located along the perimeter of the alluvial plain, which are especially generous in the rainy part of the year. Those additional quantities of water from areas outside orographic basin (Juračić, 1998) come through karst underground. Most of the rainfall occurs in the winter period (November), while the least rainfall in the summer there, so it's July and sometimes with no precipitation, and the annual evaporation is 500-900 mm. The mean annual flow of the river is 269 m³ / s, the minimum is 44 m³ / s (probability 0.05), and the largest 2,179 m³ / s (probability 0.01). Runoff coefficient is about 0.871. The flow is measured at 21 measuring station for more than 30 years. Water quality is mostly satisfactory, except in parts of the river with large settlements and downstream from them (Margeta, Fistanić, 2000).</p>						
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Whole area	100%							
Partial	50 %							
		<p>Hydrogeological cartography</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Yes</td> <td>No</td> </tr> <tr> <td>X</td> <td></td> </tr> </table>	Yes	No	X			
Yes	No							
X								
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Old	Recent	Up-to-date						
		X						
		<p>Hydro-geological monitoring plan</p>						

		None	Under preparation	Under implementation	In force				
		X							
Quality of Water monitoring plan									
		None	Under preparation	Under implementation	In force				
					X				
<div style="border: 1px solid black; display: inline-block; padding: 2px 5px; margin-right: 5px;">X</div> A2.5 Faunistic resources									
If yes, please describe the level of the available information (****)									
	Entomo-fauna	Ittio-fauna	Avi-fauna	Mammalo-fauna					
		X	X	X					
According to the IUCN Red List of Threatened Species (2012), Neretva Delta with surrounding area supports significant number of globally threatened species: 1 VU and 2 NT mammals; 5 NT birds; 2 NT reptiles; 1 VU amphibian; 2 CR, 1 EN and 5 VU fishes; 1 VU mollusc. European Red List species include: 3 NT vascular plants; 1 VU and 4 NT mammals; 2 NT reptiles; 1 VU amphibian; 2 CR, 1 EN and 5 VU fishes; 1 VU dragonfly and 1 VU mollusk. Delta supports 80 birds under BirdLife categories of Species of European Concern.									
(****) please provide a short description of the most emblematic habitat and species									
Please indicate the study surface coverage:				<table border="1" style="border-collapse: collapse; width: 100%;"> <tr> <td style="padding: 5px;">Whole area</td> <td style="text-align: center; padding: 5px;">100%</td> </tr> <tr> <td style="padding: 5px;">Partial</td> <td style="text-align: center; padding: 5px;">60%</td> </tr> </table>		Whole area	100%	Partial	60%
Whole area	100%								
Partial	60%								

		<p>Faunistic cartography</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <td style="width: 50%; text-align: center;">Yes</td> <td style="width: 50%; text-align: center;">No</td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> </tr> </table> <p>Please indicate the knowledge on the conservation status of species</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <thead> <tr> <th style="width: 40%;">Directive</th> <th style="width: 10%;">Yes</th> <th style="width: 10%;">No</th> <th style="width: 40%;">Which Species</th> </tr> </thead> <tbody> <tr> <td>92/43/EEC</td> <td style="text-align: center;">X</td> <td></td> <td></td> </tr> <tr> <td>2009/147/EC</td> <td style="text-align: center;">X</td> <td></td> <td></td> </tr> </tbody> </table> <p>Please indicate the detail level of the information</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <td style="width: 33%; text-align: center;">Low</td> <td style="width: 33%; text-align: center;">Medium</td> <td style="width: 33%; text-align: center;">High</td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;">X</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <td style="width: 33%; text-align: center;">Old</td> <td style="width: 33%; text-align: center;">Recent</td> <td style="width: 33%; text-align: center;">Up-to-date</td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> <td></td> </tr> </table> <p>Faunistic monitoring plan</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <td style="width: 25%; text-align: center;">None</td> <td style="width: 25%; text-align: center;">Under preparation</td> <td style="width: 25%; text-align: center;">Under implementation</td> <td style="width: 25%; text-align: center;">In force</td> </tr> <tr> <td></td> <td></td> <td></td> <td style="text-align: center;">X</td> </tr> </table> <p><input checked="" type="checkbox"/> A2.6 Impacts of CC on wetland management</p> <p>Identification of CC pressures on wetland</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <td style="width: 50%; text-align: center;">Yes</td> <td style="width: 50%; text-align: center;">No</td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> </tr> </table> <p>Please specify:</p>	Yes	No		X	Directive	Yes	No	Which Species	92/43/EEC	X			2009/147/EC	X			Low	Medium	High			X	Old	Recent	Up-to-date		X		None	Under preparation	Under implementation	In force				X	Yes	No	X	
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<p>A.3</p>	<p>Values of the pilot wetland</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%; text-align: center; vertical-align: middle;"><input checked="" type="checkbox"/></td> <td style="padding: 5px;"> <p>A3.1 Environmental heritage</p> <p>If yes, please describe the main features of this value (****)</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>Neretva Delta is the most valuable wetland on eastern Adriatic coast and one of only few wetlands remained in Mediterranean region of Europe. The mouth of the river Neretva is characterized by wide lagoons, sandflats and saltmarshes. Though a large area of the wetland habitat has been transformed into agricultural lands, due to the branching network of channels, these areas are still important habitats for aquatic birds and a very important ichthyologic area. Reclaimed land is covered by agricultural landscape with many irrigation channels. The Neretva Delta has many lagoons, shallow sandy bays, low sandy shores, sand flats, salt beaches, etc. The delta, lagoons and brackish waters are an exceptionally important habitat which creates room for the intensive growth of fry, which later spend their life cycle in the sea or fresh water. Furthermore, these areas are important for the migration of anadromous and catadromous fish species. Neretva Delta is important for breeding, migration and wintering of almost 200 regularly occurring bird species. With a large number of endemic species and great diversity, the mouth of the Neretva River is one of the most interesting areas of Croatia. The delta is surrounded with karst hills rich with underground water that supplies numerous springs, streams and lakes. More than 80 registered caves and other underground habitats in these karst surroundings are home for rich fauna with many threatened and endemic taxa.</p> </div> <p>(****) please provide a short description of the most emblematic habitat and species</p> </td> </tr> <tr> <td style="text-align: center; vertical-align: middle;"><input checked="" type="checkbox"/></td> <td style="padding: 5px;"> <p>A3.2 Archaeological heritage</p> <p>If yes, please describe the main features of this value</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>The Naronia Archaeological Museum is a gem, holding secrets of the Roman conquests. Located in the village of Vid the museum dominates the skyline, it was actually built around a former Roman</p> </div> </td> </tr> </table>	<input checked="" type="checkbox"/>	<p>A3.1 Environmental heritage</p> <p>If yes, please describe the main features of this value (****)</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>Neretva Delta is the most valuable wetland on eastern Adriatic coast and one of only few wetlands remained in Mediterranean region of Europe. The mouth of the river Neretva is characterized by wide lagoons, sandflats and saltmarshes. Though a large area of the wetland habitat has been transformed into agricultural lands, due to the branching network of channels, these areas are still important habitats for aquatic birds and a very important ichthyologic area. Reclaimed land is covered by agricultural landscape with many irrigation channels. The Neretva Delta has many lagoons, shallow sandy bays, low sandy shores, sand flats, salt beaches, etc. The delta, lagoons and brackish waters are an exceptionally important habitat which creates room for the intensive growth of fry, which later spend their life cycle in the sea or fresh water. Furthermore, these areas are important for the migration of anadromous and catadromous fish species. Neretva Delta is important for breeding, migration and wintering of almost 200 regularly occurring bird species. With a large number of endemic species and great diversity, the mouth of the Neretva River is one of the most interesting areas of Croatia. The delta is surrounded with karst hills rich with underground water that supplies numerous springs, streams and lakes. More than 80 registered caves and other underground habitats in these karst surroundings are home for rich fauna with many threatened and endemic taxa.</p> </div> <p>(****) please provide a short description of the most emblematic habitat and species</p>	<input checked="" type="checkbox"/>	<p>A3.2 Archaeological heritage</p> <p>If yes, please describe the main features of this value</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>The Naronia Archaeological Museum is a gem, holding secrets of the Roman conquests. Located in the village of Vid the museum dominates the skyline, it was actually built around a former Roman</p> </div>
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		<p>forum. Inside you will find an impressive and modern museum that houses statues from the time of the first Roman Emperor, Augustus, and dating back to 10 B.C.</p> <p><input checked="" type="checkbox"/> A3.3 Historical heritage</p> <p>If yes, please describe the main features of this value</p> <p>Neretva has always serves as the 'river highway' along which the area has established trade with its surrounding regions. The first traces of human habitation date back to the Bronze and Iron Ages. Stone forts and enormous burial stone piles have been found which were built by the Illyrians, the first inhabitants of the district. Greeks lived on the islands of Vis (Issa) and Hvar (Pharos), while the port they built in the 4th century AD would later develop into the port of Naron, where the village of Vid now stands. In the 2nd century AD, Naron became a Roman colony (Colonia Julia Naron) and numerous temples, winter baths, theatres, statues and more than 200 inscriptions testify to the Roman presence here. The region was prosperous for four centuries, but Avarian and Slavic raids in the 7th century led to its decline. In the 15th century, the site was invaded and occupied by the Ottomans, who destroyed many of its churches. In 1685, the Ottomans were succeeded first by the Venetians and then by the French before coming under Austro-Hungarian rule..</p> <p><input checked="" type="checkbox"/> A3.4 Architectonical heritage</p> <p>If yes, please describe the main features of this value</p> <p>Stone forts and enormous burial stone piles have been found which were built by the Illyrians, the first inhabitants of the district. The entire delta area is full of settlements; unfortunately, their ruins are below water level. The Ministry of Culture has decided to support the building of a museum in Vid to house finds from the entire region.</p>
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		<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <input checked="" type="checkbox"/> A3.5 Ethnological heritage </div> <p>If yes, please describe the main features of this value</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>The Maraton Ladja is among the most famous events in Croatia. Held under the auspices of the President of the Republic of Croatia on the second Sunday of August every year, this rowing competition for traditional boats is both a means of preserving old customs and traditions and a major tourist attraction. The region is also well-known for its gastronomic specialities, which include eels, black water-hens, frogs' legs and prawns.</p> </div> <div style="border: 1px solid black; padding: 5px;"> <input checked="" type="checkbox"/> A3.6 Landscape heritage </div> <p>If yes, please describe the main features of this value</p> <div style="border: 1px solid black; padding: 5px;"> <p>Neretva Delta is the river delta of the Neretva, a river that flows through Bosnia and Herzegovina and Croatia and empties in the Adriatic Sea. The delta is a unique landscape in southern Croatia, and a wetland that is listed under the Ramsar Convention as internationally important, as the wetland extends into the Hutovo Blato in Herzegovina. The total alluvial area of the delta is estimated at around 19,000 ha (73 sq mi), while today the delta takes up roughly 11,490 ha (44.4 sq mi). A total of 1,620 ha (6.3 sq mi) of the delta are designated protected areas: ornithological reserves: Prud, Orepak, Pod Gredom, Kuti, Modro oko and Desne lake; ornithological and ichthyological reserve at the river mouth and significant landscape Predolac Šibenica.</p> </div>															
A.4	Main threats and impacts for the biodiversity of the pilot wetland	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="width: 60%;">description of the threat</th> <th colspan="3" style="text-align: center;">relevance of the impact</th> </tr> <tr> <th style="width: 15%;">low</th> <th style="width: 15%;">medium</th> <th style="width: 10%;">high</th> </tr> </thead> <tbody> <tr> <td>Agriculture</td> <td></td> <td style="text-align: center;">X</td> <td></td> </tr> <tr> <td>Residential & commercial development</td> <td></td> <td></td> <td style="text-align: center;">X</td> </tr> </tbody> </table>	description of the threat	relevance of the impact			low	medium	high	Agriculture		X		Residential & commercial development			X
description of the threat	relevance of the impact																
	low	medium	high														
Agriculture		X															
Residential & commercial development			X														

		Energy production & mining	X		
		Transportation & service corridors		X	
		Over-exploitation, persecution & control	X		
		Land use modification	Abandonment	X	
			Intensification	X	
			Other		
		Human intrusions & disturbance			X
		Natural system modifications		X	
		Invasive & other problematic species & genes		X	
		Pollution		X	
		Geological events	X		
		Climate change & severe weather		X	
		Other	Please specify:		
A.5	Main reasons and expectations that underpin the governance process for the pilot area	<p>What are the main drivers for promoting a voluntary governance process like a Wetland Contract in the pilot area? (i.e. why to implement a governance process? why to adopt such kind of tool?)</p> <div style="border: 1px solid black; padding: 5px;"> <p>Salt water intrusion in Neretva River Delta, reduced inflow of fresh water and reduced sediment deposit represent great threat for delta. Due to this there is a change in the environment conditions in the coastal sea, and the fresh water ecosystems which results in reduction of wetlands. All of this directly affects the biodiversity of the area, target species and the habitat Natura 2000. Furthermore, as a consequence of human activity in the area, there is the distribution of contaminants in water and soil. All previously listed has a direct impact on reducing the quality of life of local communities, and loss of extremely valuable areas of biodiversity. Neretva River Delta is an area with a lot of different influences, so there are numerous activities that have or could have negative impact on the natural values site Delta Neretve, such as: planned tourist zone in Natura 2000 Illegal kite surfing activities in ichthyological - ornithological special reserve: Delta Neretve – southeastern part, illegal land reclamation, Illegal hunting etc..</p> </div>			

		<p>What are the specific objectives and expected results from the Wetland Contract of the pilot area?</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>The future of this area should be based on balancing the need for further development and the need to protect natural resources. Within the Wetland Contract it's important to define guidelines to effectively oppose salt water intrusion without obstructing fish migration, as well as guidelines for preservation of wetland area in Neretva River Delta, all respecting the needs of the development of the local communities. Multidisciplinary integrated analysis of existing data and the results of existing studies along with the results of the research campaign implemented through the project. The analysis should incorporate the results of the impact of all investigated relevant factors on biodiversity, but also to the local society, and define mitigation methods. Of utmost importance is that it is usable in the future to meet the needs of nature conservation, spatial planning, construction systems for flood protection as well as addressing cross-border issues.</p> </div> <p>Which might be the role of the Wetland Contract for adaptation of pilot wetland to Climate Change?</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>It can function as a communication and education platform to raise awareness about climate change impacts on wetlands. Role: Involves local communities in monitoring and stewardship. Builds technical and institutional capacity for adaptation. It formalizes commitments, integrates nature-based solutions, supports knowledge sharing, and enhances resilience in a structured, participatory way. It formalizes commitments, integrates nature-based solutions, supports knowledge sharing, and enhances resilience in a structured, participatory way.</p> </div>										
<p>A6</p>	<p>Auto evaluation of the global knowledge level for the target area and additional information</p>	<p>How do you evaluate the level of information regarding the target area?</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td>Very poor</td> <td>Poor</td> <td>Sufficient</td> <td>Rich</td> <td>Complete</td> </tr> <tr> <td></td> <td></td> <td></td> <td>x</td> <td></td> </tr> </table> <p>How do you evaluate the quality of information regarding the target area?</p>	Very poor	Poor	Sufficient	Rich	Complete				x	
Very poor	Poor	Sufficient	Rich	Complete								
			x									

		Very low	Low	Sufficient	High	Very high
				x		
<p>How do you evaluate the level of information on CC regarding the target area?</p>						
		Very poor	Poor	Sufficient	Rich	Complete
				x		
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				x		
<p>Please describe additional information you consider relevant not already in this report</p>						
<div style="border: 1px solid black; padding: 5px;">(max 500 characters)</div>						
<p>Please describe additional field of investigation you consider relevant for the target area to be added</p>						
<div style="border: 1px solid black; padding: 5px;">(max 500 characters)</div>						

SCIENTIFIC DESCRIPTION

REPORT

Pilot area name: Kolansko Blato coastal lake, Pag Island

Partner Name: PP7 AGRRA – Zadar County Rural Development Agency

Deliverable 1.2.3 - English summary

date: 08/08/2025

Notes:

This template is inspired by and coordinated with the documentation elaborated in the Interreg Med (2014-2020) WETNET project and the Interreg Italy-Croatia (2014-2020) CREW project.

Authors:

Edin Lugić, Elytron – Biodiversity Consultancy

Dunja Delić Božić, Wise for Nature – Nature protection Consultancy

Notes:

1) please respect the maximum number of characters for each chapter, in order to ensure the homogeneity of the partners' contributions.

Chapter number and name		Contents											
A.1	Pilot wetland ID	Name of the pilot wetland	Kolanjsko blato/Kolansko blato										
		Country	Croatia										
		Region/s	Zadar County; small part in Lika Senj County										
		Municipality/ies (*)	Number of inhabitants										
		Kolan	812										
		Novalja (City of)	3.667										
		Total	4.479										
		(*) just those one that include (part of) the protected wetland. Please add as many rows you need.											
		Organization/s responsible for the management of the pilot wetland	Name: Natura Jadera – Public Institution for the Management of Protected Areas in Zadar County Public Institution for the Management of Protected Areas and Other Protected Parts of Nature in the Lika-Senj County										
			Public body	X	Private								
		Other entities (Administrations, NGO, etc.) directly involved in the management of the pilot wetland *	<table border="1"> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> </table>										
		(*) Please add as many rows you need											
		Role of the partner in relation to the pilot area (i.e. development agency, research centre, ...)	Development agency for rural development of Zadar County - AGRRA										
		A1.1 Wetland management plan	<table border="1"> <tr><td> </td><td>foreseen</td></tr> <tr><td> </td><td>under preparation</td></tr> <tr><td>X</td><td>in force</td></tr> <tr><td> </td><td>under implementation</td></tr> </table>				foreseen		under preparation	X	in force		under implementation
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		<p><input type="checkbox"/> none</p> <p>If present, is CC mentioned amongst pressures?</p> <table border="1"> <tr> <td>Yes</td> <td>No</td> </tr> <tr> <td>X</td> <td></td> </tr> </table> <p>If present, is adaptation to CC mentioned amongst management measures?</p> <table border="1"> <tr> <td>Yes</td> <td>No</td> </tr> <tr> <td>X</td> <td></td> </tr> </table> <p>A1.2 Wetland typology</p> <table border="1"> <tr> <td><input checked="" type="checkbox"/></td> <td>marine/coastal (**)</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>inland (***)</td> </tr> <tr> <td><input type="checkbox"/></td> <td>artificial (****)</td> </tr> </table> <p>A1.3 Dominant salinity</p> <table border="1"> <tr> <td><input checked="" type="checkbox"/></td> <td>fresh water</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>brackish water</td> </tr> <tr> <td><input type="checkbox"/></td> <td>salt water</td> </tr> </table> <p>(**) including estuaries, deltas and costal lagoons (***) including rivers, marshes and peatlands (****) including ponds, wastewater treatment areas, salt exploration sites and aquacultures</p> <p>A1.4 Presence of water</p> <table border="1"> <tr> <td>Permanent</td> <td>Seasonal</td> <td>Temporary</td> <td>Intermittent</td> </tr> <tr> <td>X</td> <td>X</td> <td>X</td> <td></td> </tr> </table>	Yes	No	X		Yes	No	X		<input checked="" type="checkbox"/>	marine/coastal (**)	<input checked="" type="checkbox"/>	inland (***)	<input type="checkbox"/>	artificial (****)	<input checked="" type="checkbox"/>	fresh water	<input checked="" type="checkbox"/>	brackish water	<input type="checkbox"/>	salt water	Permanent	Seasonal	Temporary	Intermittent	X	X	X	
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Permanent	Seasonal	Temporary	Intermittent																											
X	X	X																												
<p>A.2</p>	<p>Scientific Background</p>	<p>The area has scientific information and data on:</p> <p><input checked="" type="checkbox"/> A2.1 Floristic Species</p> <p>If yes, please describe the level of the available information (****)</p> <div style="border: 1px solid black; padding: 5px;"> <p>There is various, relatively recent, botanical research of the Pag island including salt marshes and Kolansko blato pilot area.</p> <ul style="list-style-type: none"> - Dítě, D.; Dítě, Z.; Elias, P.: Šuvada, R. (2018): Rare plant species of salt marshes of the Croatian coast. Hacquetia. 17. 10.1515/hacq-2018-0002. - Mitić B., Topić J., Ilijanić Lj., Jasprica N., Milović M., Ruščić M., Pandža M., Bogadnović S., Dolina K. (2009): Kartiranje flore Dalmacije. Projekt COAST. Prirodoslovno-matematički Fakultet Sveučilišta u Zagrebu. - Nikolić T., Milović M., Bogadnović S., Jasprica N. (2015): Endemi u hrvatskoj flori. Alfa. Zagreb. - Nikolić T., ur. (2025): Flora Croatica baza podataka, on-line (http://hirc.botanic.hr/fcd). Botanički zavod Prirodoslovno-matematičkog fakulteta Sveučilišta u Zagrebu - Nikolić, T. i Topić, J. (ur.) (2005): Crvena knjiga vaskularne flore Hrvatske. Ministarstvo kulture, Državni zavod za zaštitu prirode, Zagreb. - OIKON d.o.o., Institut za primijenjenu ekologiju (2009): Karta staništa Paga - Baza podataka (u okviru projekta COAST) </div>																												

- Topić, J. (2010): Pag U: Nikolić T., Topić J., Vuković N. (ur.) (2010): Botanički važna područja Hrvatske. Školska knjiga, Zagreb.

Mapping of the flora of Dalmatia (Mitić et al, 2009) included pilot area as particularly important for biodiversity (Important Biodiversity Area – IBDA), within the priority area Island of Pag. Some rare species of Croatian flora have been found within the IPA area of Pag. One of the two known localities of the species *Scorzonera parviflora* in Croatia has been recorded there. The localities were updated through research paper Dítě et al, 2018, where this species was recorded on 6 sites on Pag island. Kolansko blato was featured with large stands with very rich populations of the species (thousands of individuals). One endemic and near threatened species (*Chouardia (Scilla) litardierei*) associated with wet, open, occasionally flooded grasslands of the pilot area, is also a target species of this Natura 2000 site.

(*****) please provide a short description of the most emblematic habitat and species

Please indicate the study surface coverage:

Whole area	-
Partial	95 %

Floristic map

Yes	No
X	

Please indicate the detail level of the information

Low	Medium	High
		X

Old	Recent	Up-to-date
	X	

Floristic monitoring plan

None	Under preparation	Under implementation	In force
	X		

A2.2 Vegetation

If yes, please describe the level of the available information (*****)

Vegetation communities of the pilot area is also relatively recent and with high level of quality researched through:

		<ul style="list-style-type: none"> - Dítě, D.; Dítě, Z.; Elias, P.; Šuvada, R. (2018): Rare plant species of salt marshes of the Croatian coast. Hacquetia. 17. 10.1515/hacq-2018-0002. - Mitić B., Topić J., Ilijanić Lj., Jasprica N., Milović M., Ruščić M., Pandža M., Bogadnović S., Dolina K. (2009): Kartiranje flore Dalmacije. Projekt COAST. Prirodoslovno-matematički Fakultet Sveučilišta u Zagrebu. - OIKON d.o.o., Institut za primijenjenu ekologiju (2009): Karta staništa Paga - Baza podataka (u okviru projekta COAST) - Topić, J. (2010): Pag U: Nikolić T., Topić J., Vuković N. (ur.) (2010): Botanički važna područja Hrvatske. Školska knjiga, Zagreb. <p>More than 30 different habitats are known from the island of Pag (Mitić et al 2009), most often determined primarily by the vegetation (phytocenological) unit (association or another vegetation unit), because vegetation, as an easily observable component of many habitats, most fully reflects their essential ecological features. Map sites of rare and endangered habitats and the list with the coordinates of the findings are a part of the Report (Mitić et al, 2009).</p> <p>(*****) please provide a short description of the most emblematic habitat and species</p> <p>Please indicate the study surface coverage:</p> <table border="1" style="float: right; margin-left: auto;"> <tr> <td>Whole area</td> <td>-</td> </tr> <tr> <td>Partial</td> <td>95 %</td> </tr> </table> <p>Vegetation map</p> <table border="1" style="margin-left: auto;"> <tr> <td>Yes</td> <td>No</td> </tr> <tr> <td>X</td> <td></td> </tr> </table> <p>Habitat map (sensu 92/43 EEC)</p> <table border="1" style="margin-left: auto;"> <tr> <td>Yes</td> <td>No</td> </tr> <tr> <td></td> <td>X</td> </tr> </table> <p>Please indicate the detail level of the information</p> <table border="1" style="margin-left: auto;"> <tr> <td>Low</td> <td>Medium</td> <td>High</td> </tr> <tr> <td></td> <td></td> <td>X</td> </tr> </table> <table border="1" style="margin-left: auto; margin-top: 10px;"> <tr> <td>Old</td> <td>Recent</td> <td>Up-to-date</td> </tr> <tr> <td></td> <td>X</td> <td></td> </tr> </table> <p>Vegetation monitoring plan</p> <table border="1" style="margin-left: auto;"> <tr> <td>None</td> <td>Under preparation</td> <td>Under implementation</td> <td>In force</td> </tr> <tr> <td></td> <td>X</td> <td></td> <td></td> </tr> </table> <p><input checked="" type="checkbox"/> A2.3 Evolution of vegetal landscape</p>	Whole area	-	Partial	95 %	Yes	No	X		Yes	No		X	Low	Medium	High			X	Old	Recent	Up-to-date		X		None	Under preparation	Under implementation	In force		X		
Whole area	-																																	
Partial	95 %																																	
Yes	No																																	
X																																		
Yes	No																																	
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Old	Recent	Up-to-date																																
	X																																	
None	Under preparation	Under implementation	In force																															
	X																																	

		<p>If yes, please describe the level of the available information (*****)</p> <p>There is an existing landscape inventory but without specific monitoring of vegetal landscape. According to the landscape typology developed as part of the COAST project (Butula et al, 2009), pilot area of Kolansko blato is characterized as “valley landscape type” of south-eastern part of the island of Pag. The valley landscape type extends across the central part of the island of Pag, SE from the apartment complex Gajac to the foot of the highest island peak, St. Vid (348 m asl), and encompasses the Kolan valley area. The spacious, flat valley floor covered with marsh and grassland vegetation and agricultural areas is framed by slopes under dry-stone walled rocky pastures, which in places turn into scrub and macchia due to overgrowth.</p> <p>The relief dynamics in the form of the alternation of karst fields and flysch valleys and the indentation of the coastline have determined the complex and diverse landscape of the island of Pag, which, in combination with the dominant landscape structures (dry-walled rocky pastures, bare steep coastal slopes, wetlands and salt pans), creates an impressive landscape with a strong spatial identity (DGU, 2022).</p> <p>- Butula, S., Andlar, G., Hrdalo, I., Hudoklin, J., Kušan, T., Kušan, V., Marković, B., Šteko, V. (2009): <i>Inventarizacija, vrednovanje i planiranje obalnih krajobraza Dalmacije. Područje jugoistočnog dijela otoka Paga</i>. Projekt COAST Očuvanje i održivo korištenje biološke i krajobrazne raznolikosti na dalmatinskoj obali putem održivog razvitka obalnog područja, Naručitelj: UNDP/GEF, 2008. Izrađivači: OIKON Zagreb, Zavod za krajobraznu arhitekturu i ukrasno bilje Agronomskog fakulteta, Urbanistički institut Ljubljana.</p> <p>(*****) please provide a short description of the most emblematic habitat and species</p> <p>Please indicate the study surface coverage:</p> <table border="1" style="float: right; margin-left: 20px;"> <tr> <td>Whole area</td> <td>-</td> </tr> <tr> <td>Partial</td> <td>90 %</td> </tr> </table> <p>Evolution of vegetal landscape map</p> <table border="1" style="margin-left: 20px;"> <tr> <td>Yes</td> <td>No</td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> </tr> </table> <p>Please indicate the detail level of the information</p> <table border="1" style="margin-left: 20px;"> <tr> <td>Low</td> <td>Medium</td> <td>High</td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> <td></td> </tr> </table> <table border="1" style="margin-left: 20px; margin-top: 10px;"> <tr> <td>Old</td> <td>Recent</td> <td>Up-to-date</td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> <td></td> </tr> </table> <p>Vegetal Landscape monitoring plan</p> <table border="1" style="margin-left: 20px;"> <tr> <td>None</td> <td>Under preparation</td> <td>Under implementation</td> <td>In force</td> </tr> </table>	Whole area	-	Partial	90 %	Yes	No		X	Low	Medium	High		X		Old	Recent	Up-to-date		X		None	Under preparation	Under implementation	In force
Whole area	-																									
Partial	90 %																									
Yes	No																									
	X																									
Low	Medium	High																								
	X																									
Old	Recent	Up-to-date																								
	X																									
None	Under preparation	Under implementation	In force																							

		X																							
<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <input checked="" type="checkbox"/> A2.4 Hydro-geological resources </div> <p>If yes, please describe the level of the available information (****)</p> <div style="border: 1px solid black; padding: 5px;"> <p>Available information are synthesized in the management plan (MINGOR, 2023) based on the Croatian Geological Survey - HGI Report:</p> <ul style="list-style-type: none"> - Ilijanić, N., Miko, S., Ivkić Filipović, I., Hasan, O., Šparica Miko, M., Heski, A., Marković, T., Petrinec, B., Orlić, S. (2021): <i>Izvešće projekta „Usluga analize sedimenta Velog i Malog blata te Kolanjskog blata na otoku Pagu“</i>. Hrvatski Geološki Institut, Zagreb. <p>Pilot area of Kolanjsko blato is located on diluvial deposits. The main part of the Neogene deposits on the Pag island appears in the Kolanjsko blato basin, which consists of clayey to sandy marls, clays, sands and fine-grained sandstones, within which coal shales and black clay in which coal occurs are found. These deposits are quickly saturated with water and form an impermeable substrate, which causes periodic surface torrents, and a significant part of the material is washed into the morphologically lower areas of the basin towards the Rogoza area and towards Kolanjsko blato, especially during high waters and tides. During the dry summer months, three separate smaller bodies of water form from one large body of water. The mud is directly connected to the sea by a drainage channel. During high tide, seawater enters the lake, while during low tide, freshwater flows into the sea (Ilijanić et al, 2022).</p> <p>(****) please provide a short description of the most emblematic habitat and species</p> <div style="display: flex; justify-content: space-between; align-items: flex-start; margin-top: 10px;"> <div style="width: 60%;"> <p>Please indicate the study surface coverage:</p> </div> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 2px 5px;">Whole area</td> <td style="padding: 2px 5px;">-</td> </tr> <tr> <td style="padding: 2px 5px;">Partial</td> <td style="padding: 2px 5px;">100%</td> </tr> </table> </div> <div style="margin-top: 10px;"> <p>Hydrogeological cartography</p> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 2px 5px;">Yes</td> <td style="padding: 2px 5px;">No</td> </tr> <tr> <td style="padding: 2px 5px;"></td> <td style="padding: 2px 5px;">X</td> </tr> </table> </div> <div style="margin-top: 10px;"> <p>Please indicate the detail level of the information</p> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 2px 5px;">Low</td> <td style="padding: 2px 5px;">Medium</td> <td style="padding: 2px 5px;">High</td> </tr> <tr> <td style="padding: 2px 5px;"></td> <td style="padding: 2px 5px;">X</td> <td style="padding: 2px 5px;"></td> </tr> </table> </div> <div style="margin-top: 10px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 2px 5px;">Old</td> <td style="padding: 2px 5px;">Recent</td> <td style="padding: 2px 5px;">Up-to-date</td> </tr> <tr> <td style="padding: 2px 5px;"></td> <td style="padding: 2px 5px;">X</td> <td style="padding: 2px 5px;"></td> </tr> </table> </div> </div>						Whole area	-	Partial	100%	Yes	No		X	Low	Medium	High		X		Old	Recent	Up-to-date		X	
Whole area	-																								
Partial	100%																								
Yes	No																								
	X																								
Low	Medium	High																							
	X																								
Old	Recent	Up-to-date																							
	X																								

Hydro-geological monitoring plan			
None	Under preparation	Under implementation	In force
			X*

*By Hrvatske vode – legal entity for water management

Quality of Water monitoring plan			
None	Under preparation	Under implementation	In force
			X*

*By Hrvatske vode – legal entity for water management

A2.5 Faunistic resources

If yes, please describe the level of the available information (****)

Entomofauna	Ichthyofauna	Ornithofauna	Mammals
X/-	X	X	-

Entomofauna
Available information on entomofauna of the pilot area Kolansko blato are mainly focused on Natura 2000 invertebrate species and endangered and/or rare species from Odonata and Lepidoptera orders. Also, there is no locality-focused inventory of the invertebrates.

- Koren T., Burić I., Štih A., Zakšek V., Verovnik R. (2010): New data about the distribution and altitudinal span of the Dalmatian rignlet, *Proterebia afra dalmata* (Godart, (1824)) (Lepidoptera:Satyrinae) in Croatia. Acta Entomologica Slovenica, 18: 143-150
- Šašić Kljajo, M. i Mihoci, I. (2009): Znanstvena analiza vrsta noćnih i danjih leptira s Dodatka II Direktive o zaštiti prirodnih staništa i divlje faune i flore za potrebe izrade prijedloga potencijalnih NATURA 2000 područja. Hrvatski prirodoslovni muzej, Zagreb
- Šašić, M., Mihoci, I., Kučinić, M (2015): Crvena knjiga danjih leptira Hrvatske. Ministarstvo zaštite okoliša i prirode, Državni zavod za zaštitu prirode, Hrvatski prirodoslovni muzeju, Zagreb
- Belančić, A., Bogdanović, T., Franković, M., Ljuština, M., Mihoković, N. i Vitas, B. (2008): Crvena knjiga vretenaca Hrvatske. (M. Franković, ur.) Zagreb: Ministarstvo kulture Republike Hrvatske, Ministarstvo zaštite okoliša i prirode, Državni zavod za zaštitu prirode, Zagreb
- Mihoković, N (2010): Monitoring, faunističke i populacijske značajke jezerskog regoča (*Lindenia tetraphylla* Vander Linden, 1825) u Hrvatskoj. Hrvatsko odonatološko društvo Platycnemis

The endemic subspecies *Proterebia afra dalmata*, a near-threatened (NT) butterfly species is mainly recorded on almost completely bare rock fields and is widely distributed on open rocky pastures of Pag (Koren et al, 2010).

		<p>Wet, calcareous and open grasslands are inhabited by the near threatened (NT) butterfly species <i>Euphydryas aurinia</i>. In the southern parts of the range, it has been recorded on dry meadows created after the cutting of Mediterranean forests of <i>Quercus ilex</i> and <i>Q. pyrenaicus</i>. The island of Pag is home to one of the rare European permanent populations of <i>Hemianax ephippiger</i> (Belančić et al, 2008). It inhabits temporary aquatic habitats on Kolanjsko Blato and is listed as a vulnerable species (VU) due to its scattered and small number of sites. It breeds in small, shallow, warm and often temporary aquatic habitats such as puddles and lakes, which can also be slightly brackish. It is a mobile species that occurs in various types of habitats but avoids wooded areas.</p> <p>Kolansko blato (with its large and shallow lake(s)) represent important area for the life cycle of the endangered (EN) species of dragonfly (Odonata) <i>Lindenia tetraphylla</i> and is essential for the migrating individuals (Mihoković, 2010). The island of Pag, along with the island of Krk, represents one of the northernmost localities of the Mediterranean part of the species' range and creates a network of habitats necessary for maintaining the metapopulation of the species in Croatia (Belančić et al, 2008; Mihoković, 2010).</p> <p>Also, dragonfly species <i>Selysiothemis nigra</i>, which inhabits only large Mediterranean wetland systems, has also been recorded on Kolansko blato. Habitats include brackish waters. With its six known populations limited only to the Mediterranean part of Croatia, is considered an endangered species (EN).</p> <p><u>Ichthyofauna</u></p> <p>There is one recent report on ichthyofauna of the pilot area:</p> <ul style="list-style-type: none"> - Vucić, M., Jelić, D. i Blažević, M. (2020): Istraživanje ihtiofaune Kolanskog Blata na otoku Pagu, izvještaj. BIOTA j.d.o.o., Grubišno polje. <p>In Kolanjsko blato, research has recorded a large number of introduced species: <i>Gambusia holbrooki</i> and three individuals of <i>Carassius gibelio</i>, which are considered invasive and harmful to the ecosystem biodiversity. Large number of mullets (Mugilidae), especially in the southern part of the blato, in contact with the sea are recorded (Vucić et al., 2020).</p> <p><u>Ornithofauna</u></p> <p>Since pilot area Kolansko blato is special ornithological reserve and a part of Natura 2000 (SPA site HR1000023 SZ Dalmacija i Pag), many reports and records of birds are available. Kolansko blato is one of the exceptionally important habitats for birds that are rich in species, primarily salt marshes and mudflats. In addition to autochthonous nesting birds, a significant number of migratory (migrating across the Adriatic) and wintering birds (from Northern Europe) use this area as an important refugia (Lukač, 2008). To date, research has recorded as</p>
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		<p>many as 268 bird species for the whole island of Pag, of which about 180 species are strictly protected.</p> <ul style="list-style-type: none"> - Crnković R. (2014.): Monitoring ptica selica na području solane Pag, solane Nin, Velog blata i Kolanskog blata tijekom jeseni 2014. godine. Izvješće za DZZP. - Crnković R. (2014a): Monitoring kratkoprste ševe (<i>Calandrella brachydactyla</i>) na područjima Veliko Suhopolje i Suhopolje (POP Cetina) i na područjima Pag (Velo blato), Pokrovnik, Privlaka, Dazlina i Velim. Završno izvješće za DZZP. - Crnković R. (2014b): Monitoring velike ševe (<i>Melanocorypha calandra</i>). Završno izvješće o obavljenim monitorinzima. Trogir - Crnković, R. (2016): Monitoring ptica močvarica na području sjeverozapadne Dalmacije; solane Dinjiška, Pag i Nin, te uvala Privlaka, tijekom proljeća 2016. Trogir - Dumbović, V., Pintar, V., Zdravec, M. (2019): Prvo izvješće o brojnosti i rasprostranjenosti ptica u Hrvatskoj sukladno odredbama Direktive o pticama. Zagreb - Juhaz, V. (2020): Fauna ptica otoka Paga. Diplomski rad. Sveučilište Josipa Jurja Strossmayera u Osijeku Odjel za biologiju. Osijek - Klanfar, T. (2018): Prvo zabilježeno gniježđenje crvenonoge vjetruše <i>Falco vespertinus</i> u Hrvatskoj; <i>Larus</i> (53) - Kralj J., Barišić, S., Tutiš, V., Čiković, D. (2013): Atlas selidbe ptica Hrvatske. Hrvatska akademija znanosti i umjetnosti, Razred za prirodne znanosti, Zavod za ornitologiju. Zagreb. - Leskovar, K., Radović, D. (2011): motrenje zimujućih populacija plivarica (plijenori, gnjurci, vranci, patkarice, liske), čaplji, galebova i dugokljune čigre u sjeverozapadnom dijelu sjeverne dalmacije od zime 2008/09. – 2010/11. Zagreb - Leskovar, K., Radović, D. (2011a): Motrenje zimujućih populacija čurlina (<i>Charadrii</i>) u sjeverozapadnom dijelu Sjeverne Dalmacije od zime 2004/05. – 2010/11. Zagreb - Lucić, V., Budinski, I., Mikulić, K. (2012): Konačno izvješće za monitoring crvenokljune čigre (<i>Sterna hirundo</i>) i male čigre (<i>Sterna albifrons</i>). Udruga za biološka istraživanja – BIOM (Završno izvješće za Državni zavod za zaštitu prirode), Zagreb. 12 str. - Lucić, V., Katanović, I., Kapelj, S. (2019): Izvještaj o kretanjima bjeloglavih supova (<i>Gyps fulvus</i>) unutar područja očuvanja značajnih za ptice Gorski kotar i sjeverna Lika (HR1000019) te Velebit (HR1000022). Udruga Biom. Zagreb - Lukač G. (2011): Atlas ptica Nacionalnog parka Paklenica. Javna ustanova Nacionalni park Paklenica, Starigrad-Paklenica. - Lukač G. (2017): Bogatstvo i raznolikost ornitofaune ornitološkog rezervata Veliko blato na otoku Pagu i uvale Plemići - Lukač, G. (2008): Bogatstvo i raznolikost ornitofaune ornitološkog rezervata Veliko blato na otoku Pagu, Studija i popis ptica. Starigrad – Paklenica
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		<ul style="list-style-type: none"> - Mikulić K, Zec M, Hudina T, Kapelj S (2015) Narativni dio izvještaja projekta „Istraživanje i zaštita eje livadarke (Circus pygargus) u Hrvatskoj“ za Fond za zaštitu okoliša i energetska učinkovitost. Udruga BIOM, Zagreb, 21 str. - Mikulić K., Kapelj S., Zec M., Katanović I., Budinski I., Martinović M., Hudina T., Šoštarčić I., Ječmenica B., Lucić V., Dumbović Mazal V. (2016) Završno izvješće za skupinu Aves. U: Mrakovčić M., Mustafić P., Jelić D., Mikulić K., Mazija M., Maguire I., Šašić Kljajo M., Kotarac M., Popijač A., Kučinić M., Mesić Z. (ur.) Projekt integracije u EU Natura 2000 - Terensko istraživanje i laboratorijska analiza novoprikupljenih inventarizacijskih podataka za taksonomske skupine: Actinopterygii i Cephalaspidomorphi, Amphibia i Reptilia, Aves, Chiroptera, Decapoda, Lepidoptera, Odonata, Plecoptera, Trichoptera. OIKON-HID-HYLANATURA-BIOM-CKFF-GEONATURA-HPM-TRAGUS, Zagreb: 69-49. - Mikulić, K., Budinski, I., Lucić, V. (2010): Istraživanje bjelonokte vjetruše (Falco naumanni) u Primorju. Konačni izvještaj za 2010. Udruga za biološka istraživanja - BIOM, Zagreb. - Mikulić, K., Budinski, I., Zec, M. (2014) Monitoring nacionalne populacije bjelonokte vjetruše (Falco naumanni). Konačni izvještaj za 2014. Udruga BIOM, Zagreb - Mikulić, K., Majer, M., Zec, M., Čulig, P., Katanović, I. (2017): Indeks populacije čestih vrsta ptica na poljoprivrednim staništima. Izvještaj za 2015. i 2016. Godinu. Udruga BIOM. Zagreb. - Mikulić, K., Rajković, Ž., Kapelj, S., Zec, M., Lucić, V., Šarić, I., Dender, D. Budinski, I. (2019.): Završno izvješće terenskih istraživanja u 2018. i 2019. godini u sklopu izrade stručne podloge – suri orao, u sklopu projekta OPKK 2014.-2020. "Izrada prijedloga planova upravljanja strogo zaštićenim vrstama (s akcijskim planovima)" Udruga BIOM. Zagreb. - Radović, D. (2008): COAST projekt. Kartiranje ptica na zadanom području otoka Paga, ušća rijeke Krke s otokom Prvićem, te Viškom otočju, Palagruži i otoku Mljetu. Hrvatsko ornitološko društvo, Zagreb - Radović, D. (2013): Završno izvješće za monitoring morskog kulika (Charadrius alexandrinus) na području Hrvatske tijekom 2012. godine. Konačno izvješće. Hrvatsko ornitološko društvo, Zagreb - Radović, D. (2013a): Završno izvješće za monitoring vlastelice (Himantopus himantopus) u sjeverozapadnoj Dalmaciji, delti Neretve i Virovitici 2012. godine. Konačno izvješće. Hrvatsko ornitološko društvo, Zagreb - Stumberger, B. (2016): Rezultati brojanja ptica močvarica i grabljivica u najvažnijim močvarama otoka Paga; Larus - Sušić, G. (2013): Procjena stanja populacije bjeloglavih supova na području ornitoloških rezervata na Cresu, Krku i Prviću, te na Plavniku u 2013.godini. Centar za zaštitu ptica grabljivica Grifon. Rijeka.
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- Svensson L., Mullarney K., Zeteström D. (2018): Ptice Hrvatske i Europe. Udruga Biom, Zagreb.

Fauna of mammals
 There is no systematic available information on mammals in the pilot area. There is only one record of bat species *Pipistrellus kuhlii/nathusii* near Kolansko blato (Gojznikar, J., Gabor, M., & Poljanec, N. (2017): A few observations of bats (Chiroptera) on Pag Island (Croatia). *Hypsugo*, 2, 53-58.). In the Management plan (MINGOR/MZOZT, 2023) in the context of hunting game species for the whole island area, the most common is the common hare (*Lepus europaeus*). In addition, the European rabbit (*Oryctolagus cuniculus*) is widely distributed and has been introduced to the island of Pag.

(*****) please provide a short description of the most emblematic habitat and species

Please indicate the study surface coverage:

Whole area	-
Partial	45 %

Faunistic cartography

Yes	No
	X

Please indicate the knowledge on the conservation status of species (Reporting for the period 2019-2024 is ongoing - submission from MS - so more accurate data on conservation status will be available by the end of 2025)

Directive	Yes	No	Which Species
92/43/EEC	x		<i>Emys orbicularis</i> <i>Zamenis situla</i> <i>Proterebia afra dalmata</i> <i>Euphydrias aurinia</i> <i>Chouardia litardierei</i>
2009/147/EC	x		Most of target species of the SPA HR1000023 SZ Dalmacija i Pag

Please indicate the detail level of the information

Low	Medium	High
	X	X

Old	Recent	Up-to-date
	X	

Faunistic monitoring plan

None	Under preparation	Under implementation	In force
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		X																										
<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <input checked="" type="checkbox"/> A2.6 Impacts of CC on wetland management </div> <p>Identification of CC pressures on wetland</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <td style="width: 50%; text-align: center;">Yes</td> <td style="width: 50%; text-align: center;">No</td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> </tr> </table> <p>Please specify:</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <thead> <tr> <th style="width: 70%;">CC pressure</th> <th style="width: 30%;">detail</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;"> Loss of wetland habitats – loss of ecosystem services they provide (groundwater availability, mitigation of weather extremes, CO2 sequestration etc.) Specifically, variation in the regime of: DROUGHTS, FIRES, SEA CHEMICAL-PHYSICAL CONDITION, WINDS, TIDES, EXTREME RAINFALLS, FLOODS, STORM SURGES and COASTAL SEDIMENT DYNAMICS. </td> <td style="text-align: center; vertical-align: middle;">low</td> </tr> <tr> <td></td> <td style="text-align: center;">high/medium/low</td> </tr> </tbody> </table> <p>Identification of CC impacts on wetland</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <td style="width: 50%; text-align: center;">Yes</td> <td style="width: 50%; text-align: center;">No</td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> </tr> </table> <p>Please specify:</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <thead> <tr> <th style="width: 70%;">CC impacts</th> <th style="width: 30%;">detail</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;"> - Physiochemical (e.g. increase in salinity, organic matter, temperature), morphology of the shores and bottoms, vegetation (macrophytes) compositions, changes of habitat types, loss of sensitive and ecologically specific species (highly vulnerable to changes in its environment) </td> <td style="text-align: center; vertical-align: middle;">low</td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table> <p>Identification of CC adaptation measures on wetland</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Yes</td> <td style="width: 50%; text-align: center;">No</td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> </tr> </table>					Yes	No	X		CC pressure	detail	Loss of wetland habitats – loss of ecosystem services they provide (groundwater availability, mitigation of weather extremes, CO2 sequestration etc.) Specifically, variation in the regime of: DROUGHTS, FIRES, SEA CHEMICAL-PHYSICAL CONDITION, WINDS, TIDES, EXTREME RAINFALLS, FLOODS, STORM SURGES and COASTAL SEDIMENT DYNAMICS.	low		high/medium/low	Yes	No	X		CC impacts	detail	- Physiochemical (e.g. increase in salinity, organic matter, temperature), morphology of the shores and bottoms, vegetation (macrophytes) compositions, changes of habitat types, loss of sensitive and ecologically specific species (highly vulnerable to changes in its environment)	low			Yes	No	X	
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A.3	Values of the pilot wetland	<p><input checked="" type="checkbox"/> A3.1 Environmental heritage</p> <p>If yes, please describe the main features of this value (****)</p> <div style="border: 1px solid black; padding: 2px;"> <p>As previously described, pilot area is a special ornithological reserve – protected area based on Nature Protection Act (OG 80/2013, 15/2018, 14/19, 127/19, 155/23).</p> </div> <p>(*****) please provide a short description of the most emblematic habitat and species</p> <p><input checked="" type="checkbox"/> A3.2 Archaeological heritage</p> <p>If yes, please describe the main features of this value</p> <div style="border: 1px solid black; padding: 2px;"> <p>-</p> </div> <p><input checked="" type="checkbox"/> A3.3 Historical heritage</p> <p>If yes, please describe the main features of this value</p> <div style="border: 1px solid black; padding: 2px;"> <p>The whole Island of Pag has a rich thousand-year-old tradition, known as the island of salt, cheese and lace precisely because of the traditional uses associated with its natural characteristics. Agriculture</p> </div>								

		<p>has had a major impact on the lives of the islanders for centuries, primarily due to the fertile sandy soil found in the few fields on the island. However, the lack of fertile land has greatly affected economic development, which is why the population has historically focused mainly on livestock farming, viticulture and fishing, and more recently on tourism.</p> <p><input type="checkbox"/> A3.4 Architectonical heritage</p> <p>If yes, please describe the main features of this value</p> <p>-</p> <p><input type="checkbox"/> A3.5 Ethnological heritage</p> <p>If yes, please describe the main features of this value</p> <p>-</p> <p><input checked="" type="checkbox"/> A3.6 Landscape heritage</p> <p>If yes, please describe the main features of this value</p> <p>The rocky landscape with the occasional aromatic herb grazed by sheep creates a unique atmosphere. Cultivated areas on the island of Pag are mostly used as karst pastures, but also meadows, olive groves and arable land. Olive agriculture and viticulture have a long tradition on the island of Pag. Other crops are grown mainly for the own needs and in very small quantities, but special emphasis should be placed on the wild edible and medicinal herbs for which the island of Pag is famous, and which are of great importance to local livestock farmers and beekeepers (e.g. sage, fennel, rosemary, etc).</p>																																													
A.4	Main threats and impacts for the biodiversity of the pilot wetland	<table border="1"> <thead> <tr> <th rowspan="2">description of the threat</th> <th colspan="3">relevance of the impact</th> </tr> <tr> <th>low</th> <th>medium</th> <th>high</th> </tr> </thead> <tbody> <tr> <td>Agriculture</td> <td></td> <td>X</td> <td></td> </tr> <tr> <td>Residential & commercial development</td> <td></td> <td></td> <td>X</td> </tr> <tr> <td>Energy production & mining</td> <td></td> <td></td> <td>X</td> </tr> <tr> <td>Transportation & service corridors</td> <td></td> <td>X</td> <td></td> </tr> <tr> <td>Over-exploitation, persecution & control</td> <td></td> <td>X</td> <td></td> </tr> <tr> <td rowspan="3">Land use modification</td> <td>Abandonment</td> <td></td> <td>X</td> </tr> <tr> <td>Intensification</td> <td>X</td> <td></td> </tr> <tr> <td>Other</td> <td>X</td> <td></td> </tr> <tr> <td>Human intrusions & disturbance</td> <td></td> <td>X</td> <td></td> </tr> <tr> <td>Natural system modifications</td> <td></td> <td>X</td> <td></td> </tr> </tbody> </table>	description of the threat	relevance of the impact			low	medium	high	Agriculture		X		Residential & commercial development			X	Energy production & mining			X	Transportation & service corridors		X		Over-exploitation, persecution & control		X		Land use modification	Abandonment		X	Intensification	X		Other	X		Human intrusions & disturbance		X		Natural system modifications		X	
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A.5	Main reasons and expectations that underpin the governance process for the pilot area	<p>What are the main drivers for promoting a voluntary governance process like a Wetland Contract in the pilot area? (i.e. why to implement a governance process? why to adopt such kind of tool?)</p> <p>Conservation of very important habitat for birds but also wetland biodiversity in general (on the level of whole Mediterranean basin), Conserve and improve ecosystem services it provides to local society: mitigation of climate change negative impacts, purification and storage of drinkable water, nursery for species, cultural services, etc). Wetland Contract will improve also a sustainable and nature-friendly touristic content directly improving economic status of the local community and its well-being.</p> <p>What are the specific objectives and expected results from the Wetland Contract of the pilot area?</p> <p>Specific objectives will be defined trough stakeholders' consultation and their prioritization of activities needed to conserve the pilot area.</p> <p>Which might be the role of the Wetland Contract for adaptation of pilot wetland to Climate Change?</p> <p>Defining urgent measures and actions addressing the locality-specific most important negative impacts of the CC.</p>																																								
A6	Auto evaluation of the global knowledge level for the target area and additional information	<p>How do you evaluate the level of information regarding the target area?</p> <table border="1"> <tr> <td>Very poor</td> <td>Poor</td> <td>Sufficient</td> <td>Rich</td> <td>Complete</td> </tr> <tr> <td></td> <td>X</td> <td>X</td> <td></td> <td></td> </tr> </table> <p>How do you evaluate the quality of information regarding the target area?</p> <table border="1"> <tr> <td>Very low</td> <td>Low</td> <td>Sufficient</td> <td>High</td> <td>Very high</td> </tr> <tr> <td></td> <td></td> <td></td> <td>X</td> <td></td> </tr> </table> <p>How do you evaluate the level of information on CC regarding the target area?</p> <table border="1"> <tr> <td>Very poor</td> <td>Poor</td> <td>Sufficient</td> <td>Rich</td> <td>Complete</td> </tr> <tr> <td></td> <td>X</td> <td></td> <td></td> <td></td> </tr> </table> <p>How do you evaluate the quality of information on CC regarding the target area?</p> <table border="1"> <tr> <td>Very low</td> <td>Low</td> <td>Sufficient</td> <td>High</td> <td>Very high</td> </tr> <tr> <td></td> <td>X</td> <td></td> <td></td> <td></td> </tr> </table>	Very poor	Poor	Sufficient	Rich	Complete		X	X			Very low	Low	Sufficient	High	Very high				X		Very poor	Poor	Sufficient	Rich	Complete		X				Very low	Low	Sufficient	High	Very high		X			
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		<p>Please describe additional information you consider relevant not already in this report</p> <div style="border: 1px solid black; height: 27px; width: 528px;"></div> <p>Please describe additional field of investigation you consider relevant for the target area to be added</p> <div style="border: 1px solid black; padding: 5px;"> <p>Initial research of other important fauna of the pilot area including water invertebrates, fish, amphibians, reptiles, mammals. Hydromorphological research in relation to climate change impacts especially salinization, sea level rising, extreme floods and droughts, groundwater availability etc. Research of invasive alien species including the assessment of the introduction and spreading risk.</p> </div>
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SCIENTIFIC DESCRIPTION REPORT

Pilot area name: Brijuni Archipelago

Partner Name: PP8 NPB - Public Institution Brijuni National Park

Deliverable 1.2.3 a - English summary

date: 01/Sept/2025

Notes:

This template is inspired by and coordinated with the documentation elaborated in the Interreg Med (2014-2020) WETNET project and the Interreg Italy-Croatia (2014-2020) CREW project.

Authors:

Martina Hervat, Public Institution Brijuni National Park

Željka Rajković, NIX

Notes:

please respect the maximum number of characters for each chapter, in order to ensure the homogeneity of the partners' contributions.

Chapter number and name		Contents							
A.1	Pilot wetland ID	<table border="1"> <tr> <td>Name of the pilot wetland</td> <td>Saline Wetland</td> </tr> <tr> <td>Country</td> <td>Croatia</td> </tr> <tr> <td>Region/s</td> <td>Istria</td> </tr> </table>		Name of the pilot wetland	Saline Wetland	Country	Croatia	Region/s	Istria
Name of the pilot wetland	Saline Wetland								
Country	Croatia								
Region/s	Istria								
		Municipality/ies (*)	Number of inhabitants						
		City of Pula	52.920						
		Municipality of Fažana	1.788						
		City of Vodnjan	5.838						
		Note: Saline wetland is situated on Great Brijun island, part of the City of Pula. No inhabitants in the National Park Brijuni and in the locality of Saline, but we engaged a wider stakeholder group from the three communities.							
		Total	60.546						
		(*) just those one that include (part of) the protected wetland. Please add as many rows you need.							
		Organization/s responsible for the management of the pilot wetland	Name: Public Institution Brijuni National Park						

			Public body	X	Private																	
		<p>Other entities (Administrations, NGO, etc.) directly involved in the management of the pilot wetland *</p> <p>(*) Please add as many rows you need</p> <p>Role of the partner in relation to the pilot area (i.e. development agency, research centre, ...)</p> <p>A1.1 Wetland management plan</p> <table style="border-collapse: collapse;"> <tr><td style="border: 1px solid black; width: 30px; height: 20px;"></td><td>foreseen</td></tr> <tr><td style="border: 1px solid black; width: 30px; height: 20px;"></td><td>under preparation</td></tr> <tr><td style="border: 1px solid black; width: 30px; height: 20px; text-align: center;">X</td><td>in force</td></tr> <tr><td style="border: 1px solid black; width: 30px; height: 20px;"></td><td>under implementation</td></tr> <tr><td style="border: 1px solid black; width: 30px; height: 20px;"></td><td>none</td></tr> </table> <p>If present, is CC mentioned amongst pressures?</p> <table border="1" style="border-collapse: collapse; width: 100%;"> <tr><td style="width: 50%; text-align: center;">Yes</td><td style="width: 50%; text-align: center;">No</td></tr> <tr><td></td><td style="text-align: center;">X</td></tr> </table> <p>If present, is adaptation to CC mentioned amongst management measures?</p> <table border="1" style="border-collapse: collapse; width: 100%;"> <tr><td style="width: 50%; text-align: center;">Yes</td><td style="width: 50%; text-align: center;">No</td></tr> </table>		foreseen		under preparation	X	in force		under implementation		none	Yes	No		X	Yes	No				
	foreseen																					
	under preparation																					
X	in force																					
	under implementation																					
	none																					
Yes	No																					
	X																					
Yes	No																					
		<p>Croatian Forests – state enterprise responsible for forest and woodland management in the Republic of Croatia</p>																				
		<p>The public institution is directly in charge of nature conservation in the national park, including the pilot area.</p>																				

		<table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <td style="width: 50px; height: 20px;"></td> <td style="width: 50px; text-align: center;">X</td> </tr> </table> <div style="display: flex; justify-content: space-around;"> <div style="width: 45%;"> <p>A1.2 Wetland typology</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40px; text-align: center;">X</td> <td>marine/coastal (**)</td> </tr> <tr> <td style="text-align: center;"></td> <td>inland (***)</td> </tr> <tr> <td style="text-align: center;"></td> <td>artificial (****)</td> </tr> </table> <p>(**) including estuaries, deltas and costal lagoons</p> <p>(***) including rivers, marshes and peatlands</p> <p>(****) including ponds, wastewater treatment areas, salt exploration sites and aquacultures</p> </div> <div style="width: 45%;"> <p>A1.3 Dominant salinity</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40px; text-align: center;"></td> <td>fresh water</td> </tr> <tr> <td style="text-align: center;">X</td> <td>brackish water</td> </tr> <tr> <td style="text-align: center;"></td> <td>salt water</td> </tr> </table> </div> </div> <p>A1.4 Presence of water</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <th style="width: 25%;">Permanent</th> <th style="width: 25%;">Seasonal</th> <th style="width: 25%;">Temporary</th> <th style="width: 25%;">Intermittent</th> </tr> <tr> <td></td> <td></td> <td></td> <td>X</td> </tr> </table>		X	X	marine/coastal (**)		inland (***)		artificial (****)		fresh water	X	brackish water		salt water	Permanent	Seasonal	Temporary	Intermittent				X
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A.2	Scientific Background	<p>The area has scientific information and data on:</p> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="width: 40px; text-align: center;">X</td> <td>A2.1 Floristic Species</td> </tr> </table> <p>If yes, please describe the level of the available information (*****)</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Within the Saline wetland, the submerged macrophyte <i>Ruppia maritima</i> (beaked tasselweed, EUNIS A5.5343; Bern Convention Resolution 4 habitat, A5) is widely distributed across all three water bodies which are part of Saline wetland. Common reed, <i>Phragmites australis</i>, essential for wetland structure and function, perished due to excessive salinity in water and sediment. Ecological restoration is required, including reed transplantation from suitable donor sites.</p> </div> <p>(*****) please provide a short description of the most emblematic habitat and species</p>	X	A2.1 Floristic Species																				
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		<p>Please indicate the study surface coverage:</p> <table border="1" style="float: right; margin-left: auto;"> <tr> <td style="width: 15%;">Whole area</td> <td style="width: 15%;">100%</td> </tr> <tr> <td>Partial</td> <td></td> </tr> </table>	Whole area	100%	Partial					
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Partial										
		<p>Floristic map</p> <table border="1" style="margin-left: auto;"> <tr> <td style="width: 15%;">Yes</td> <td style="width: 15%;">No</td> </tr> <tr> <td></td> <td style="text-align: center;">X</td> </tr> </table>	Yes	No		X				
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	X									
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Old	Recent	Up-to-date								
	X									
		<p>Floristic monitoring plan</p> <table border="1" style="margin-left: auto;"> <tr> <td style="width: 15%;">None</td> <td style="width: 15%;">Under preparation</td> <td style="width: 15%;">Under implementation</td> <td style="width: 15%;">In force</td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> </tr> </table>	None	Under preparation	Under implementation	In force	X			
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X										
		<table border="1" style="margin-left: auto;"> <tr> <td style="width: 15%; text-align: center;">X</td> <td style="width: 15%;">A2.2 Vegetation</td> </tr> </table>	X	A2.2 Vegetation						
X	A2.2 Vegetation									
		<p>If yes, please describe the level of the available information (*****)</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>The Saline woodland is composed of both native and non-native tree species, including conifers and broadleaves, with mature Aleppo pine as the dominant element. Several non-native species show good adaptation to local site conditions. However, browsing, seed predation and trampling by wildlife severely hinder natural regeneration, posing risks for long-term forest sustainability.</p> </div>								

(*****) please provide a short description of the most emblematic habitat and species

Please indicate the study surface coverage:

Whole area	100%
Partial	

Vegetation map

Yes	No
X	

Habitat map (sensu 92/43 EEC)

Yes	No
X	

Please indicate the detail level of the information

Low	Medium	High
		X

Old	Recent	Up-to-date
		X

Vegetation monitoring plan

None	Under preparation	Under implementation	In force
X			

A2.3 Evolution of vegetal landscape

If yes, please describe the level of the available information (*****)

		<p>The area evolved from a marine lagoon into saltpans and, about a century ago, into wetlands. In the 1960s it was largely barren, with scarce vegetation dominated by holm oak and olive. During that period, conifers and other non-native species were introduced, shaping today's mixed woodland composition.</p>								
		<p>(****) please provide a short description of the most emblematic habitat and species</p>								
		<p>Please indicate the study surface coverage:</p> <table border="1" style="float: right; border-collapse: collapse;"> <tr> <td style="padding: 5px;">Whole area</td> <td style="padding: 5px;">100%</td> </tr> <tr> <td style="padding: 5px;">Partial</td> <td style="padding: 5px;"></td> </tr> </table>	Whole area	100%	Partial					
Whole area	100%									
Partial										
		<p>Evolution of vegetal landscape map</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td style="padding: 5px;">Yes</td> <td style="padding: 5px;">No</td> </tr> <tr> <td style="padding: 5px; text-align: center;">X</td> <td style="padding: 5px;"></td> </tr> </table>	Yes	No	X					
Yes	No									
X										
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Old	Recent	Up-to-date								
		X								
		<p>Vegetal Landscape monitoring plan</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td style="padding: 5px;">None</td> <td style="padding: 5px;">Under preparation</td> <td style="padding: 5px;">Under implementation</td> <td style="padding: 5px;">In force</td> </tr> <tr> <td style="padding: 5px; text-align: center;">X</td> <td style="padding: 5px;"></td> <td style="padding: 5px;"></td> <td style="padding: 5px;"></td> </tr> </table>	None	Under preparation	Under implementation	In force	X			
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X										
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If yes, please describe the level of the available information (*****)

The Saline wetlands (12 ha) on Veli Brijun are an artificial system of three shallow ponds created on former saltpans. This fragile brackish habitat, important for migratory birds, is under pressure from climate change, eutrophication and drought, with ponds drying up in 2022. Hydrological monitoring is underway, and abandoned mid-20th century wells may provide additional water. Planned restoration includes water inflow, circulation, desiltation and habitat recovery.

(*****) please provide a short description of the most emblematic habitat and species

Please indicate the study surface coverage:

Whole area	100%

Hydrogeological cartography

Yes	No
X	

Please indicate the detail level of the information

Low	Medium	High
	X	

Old	Recent	Up-to-date
	X	

Hydro-geological monitoring plan

None	Under preparation	Under implementation	In force
		X	

		<p>Quality of Water monitoring plan</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 20px;"> <thead> <tr> <th style="width: 25%;">None</th> <th style="width: 25%;">Under preparation</th> <th style="width: 25%;">Under implementation</th> <th style="width: 25%;">In force</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> </tr> </tbody> </table> <p><input type="checkbox"/> A2.5 Faunistic resources</p> <p>If yes, please describe the level of the available information (*****)</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 20px;"> <thead> <tr> <th style="width: 25%;">Entomo-fauna</th> <th style="width: 25%;">Ichtyo-fauna</th> <th style="width: 25%;">Avi-fauna</th> <th style="width: 25%;">Mammal-fauna</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">X</td> <td></td> <td style="text-align: center;">X</td> <td></td> </tr> </tbody> </table> <div style="border: 1px solid black; padding: 10px; margin-bottom: 20px;"> <p>The fauna of Saline, though not highly diverse due to habitat degradation, holds significant ecological potential. Avifauna is monitored frequently. Birds remain the most prominent group, with 16 recorded breeding species, including blackbird (7 pairs), nightingale (5 pairs), and blackcap (4 pairs). Aquatic habitats support breeding coots (7 pairs), mallards (at least 6 pairs), and little grebes (2-3 pairs). Migratory species, such as herons and Charadriiformes, are attracted to shallow lakes. Among insects, dragonflies, particularly the southern darter (<i>Sympetrum meridionale</i>), are prevalent, with the southern emperor (<i>Aeshna affinis</i>) likely breeding locally. Herpetofauna includes the Italian wall lizard, black whipsnake, and European pond turtle (<i>Emys orbicularis</i>), but no frogs were recorded. Bats, with 14 species, are highly active above water surfaces. Ongoing targeted research focuses on specific insect groups (nocturnal butterflies and dragonflies) and aquatic ecosystems, including macrozoobenthos, plankton, and aquatic protists, to support conservation efforts.</p> </div> <p>(*****) please provide a short description of the most emblematic habitat and species</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 20px;"> <tr> <td style="width: 50%;">Whole area</td> <td style="width: 50%;">100%</td> </tr> </table>	None	Under preparation	Under implementation	In force			X		Entomo-fauna	Ichtyo-fauna	Avi-fauna	Mammal-fauna	X		X		Whole area	100%
None	Under preparation	Under implementation	In force																	
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Whole area	100%																			

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Yes	No														
	X														
		<p>Please indicate the knowledge on the conservation status of species</p> <table border="1" style="width: 100%; margin-top: 10px;"> <thead> <tr> <th style="width: 25%;">Directive</th> <th style="width: 10%;">Yes</th> <th style="width: 10%;">No</th> <th style="width: 55%;">Which Species</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; vertical-align: middle;">92/43/EEC</td> <td style="text-align: center;">X</td> <td></td> <td>European pond turtle (<i>Emys orbicularis</i>), listed in Annex II and IV, requiring strict protection and designation of Special Areas of Conservation (SACs). Several bat species (e.g., <i>Rhinolophus</i> spp., <i>Myotis</i> spp.) recorded in Saline are also listed in Annex II and IV, necessitating habitat conservation.</td> </tr> <tr> <td style="text-align: center; vertical-align: middle;">2009/147/EC</td> <td style="text-align: center;">X</td> <td></td> <td>All wild birds in Saline are protected.</td> </tr> </tbody> </table>	Directive	Yes	No	Which Species	92/43/EEC	X		European pond turtle (<i>Emys orbicularis</i>), listed in Annex II and IV, requiring strict protection and designation of Special Areas of Conservation (SACs). Several bat species (e.g., <i>Rhinolophus</i> spp., <i>Myotis</i> spp.) recorded in Saline are also listed in Annex II and IV, necessitating habitat conservation.	2009/147/EC	X		All wild birds in Saline are protected.	
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Low	Medium	High													
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Old	Recent	Up-to-date													

		X							
Faunistic monitoring plan									
None		Under preparation		Under implementation		In force			
		X							
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X	A2.6 Impacts of CC on wetland management								
Identification of CC pressures on wetland									
Yes		No							
X									
Please specify::									
CC pressure[GG1]				detail					
Heat waves				moderate					
Cold waves				low					
Fires				high					
Droughts				high					
Chemical-physical condition				high					
Lightening				low					
Winds				moderate					
Tides				low					

		<table border="1"> <tr> <td>Rainfalls</td> <td>high</td> </tr> <tr> <td>Floods</td> <td>high</td> </tr> <tr> <td>Storm surges</td> <td>medium</td> </tr> <tr> <td>Coastal sediment dynamics</td> <td>low</td> </tr> </table> <p>Identification of CC impacts on wetland</p> <table border="1"> <tr> <td>Yes</td> <td>No</td> </tr> <tr> <td>X</td> <td></td> </tr> </table> <p>Please specify:</p> <table border="1"> <thead> <tr> <th>CC impacts</th> <th>detail</th> </tr> </thead> <tbody> <tr> <td>Heat waves</td> <td>Water quality decline, biodiversity stress, reduced ecosystem resilience</td> </tr> <tr> <td>Cold waves</td> <td>Stresses fauna, affects reed survival</td> </tr> <tr> <td>Fires</td> <td>Damages vegetation, reduces resilience</td> </tr> <tr> <td>Droughts</td> <td>Lowers water levels, increases salinity</td> </tr> <tr> <td>Chemical-physical condition</td> <td>Alters water quality, promotes eutrophication</td> </tr> <tr> <td>Lightening</td> <td>Risks fire, damages flora/fauna</td> </tr> </tbody> </table>	Rainfalls	high	Floods	high	Storm surges	medium	Coastal sediment dynamics	low	Yes	No	X		CC impacts	detail	Heat waves	Water quality decline, biodiversity stress, reduced ecosystem resilience	Cold waves	Stresses fauna, affects reed survival	Fires	Damages vegetation, reduces resilience	Droughts	Lowers water levels, increases salinity	Chemical-physical condition	Alters water quality, promotes eutrophication	Lightening	Risks fire, damages flora/fauna
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Lightening	Risks fire, damages flora/fauna																											

		Winds	Erodes soil, affects reed stability										
		Tides	Influences salinity, coastal flooding										
		Rainfalls	Affects water levels, nutrient runoff										
		Floods	Inundates wetland, disrupts ecosystems										
		Storm surges	Causes flooding, marine litter influx										
		Coastal sediment dynamics	Alters habitat, impacts biodiversity										
<p>Identification of CC adaptation measures on wetland</p> <table border="1"> <tr> <td>Yes</td> <td>No</td> </tr> <tr> <td>X</td> <td></td> </tr> </table> <p>Please specify:</p> <table border="1"> <thead> <tr> <th>CC adaptation measure</th> <th>detail</th> </tr> </thead> <tbody> <tr> <td>Fires - Forest restoration and fire protection</td> <td>Study to restore woodlands with resilient species (e.g., replacing eucalyptus); enhance fire protection via Wetland Contract with island stakeholders.</td> </tr> <tr> <td>Droughts - Water retention systems</td> <td>Monitor water levels with gauges and sensors; restore water to enhance</td> </tr> </tbody> </table>				Yes	No	X		CC adaptation measure	detail	Fires - Forest restoration and fire protection	Study to restore woodlands with resilient species (e.g., replacing eucalyptus); enhance fire protection via Wetland Contract with island stakeholders.	Droughts - Water retention systems	Monitor water levels with gauges and sensors; restore water to enhance
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			resilience (out of the scope of GREW project).
		Chemical-Physical Condition - Water quality monitoring, biodiversity monitoring	Use sensors and citizen science to track water quality and eutrophication. Additionally, biological monitoring of target groups of invertebrates both on land and in water as they are proxy of the habitat quality, but also support bird ringing activities as birds are umbrella species for wetlands
		Winds - Windbreaks, reed restoration	Plan to restore (enhance resilience with more tolerant) tree species and replant reed (out of the scope of this project)
		Rainfall - Runoff management	Control nutrient runoff; track water quality with sensor, macrofaunal groups monitoring and citizen science contribution via app.
		Floods	Planning restoration
		Storm Surges - Coastal buffers	Use vegetation to reduce litter washed ashore,

			monitored via citizen science.
A.3	Values of the pilot wetland	<input checked="" type="checkbox"/> A3.1 Environmental heritage If yes, please describe the main features of this value (*****) <div style="border: 1px solid black; padding: 5px;"> <p>Salina, as part of the Brijuni National Park, lies within the Special Area of Conservation for species and habitat types (SAC) – HR2000604 Nacionalni park Brijuni, and the Special Protection Area (SPA) – HR1000032 Akvatorij zapadne Istre (Regulation on the Ecological Network and Competences of Public Institutions for Managing Ecological Network Areas, Official Gazette No. 80/19 and 119/23).</p> <p>The planned ecological restoration of Salina aims to enhance and protect the following:</p> <ul style="list-style-type: none"> • Freshwater or slightly brackish habitats, • Reedbed restoration (<i>Phragmites</i> sp.), • Brackish habitats, • Temporary freshwater habitats, • Habitats of the European pond turtle (<i>Emys orbicularis</i>), • Habitats of other rare and/or endangered plant and animal species, • Restoration of connectivity between water bodies, maquis, and forest (ecotone). </div> <p>(*****) please provide a short description of the most emblematic habitat and species</p>	
		<input checked="" type="checkbox"/> A3.2 Archaeological heritage	

		<p>If yes, please describe the main features of this value</p> <div style="border: 1px solid black; padding: 5px;"> <p>Salina lies within the spatial boundaries of the protected cultural landscape of the Brijuni Archipelago, inscribed by the Decision of the Ministry of Culture of the Republic of Croatia – Directorate for the Protection of Cultural Heritage (CLASS: UP/I-612-08/13-06/009, REF: 532-04-0104/11-13-1, dated 29 April 2023), in the Register of Cultural Assets of the Republic of Croatia – List of Protected Cultural Assets under number Z-5983. As a prerequisite for ecological restoration, the Ministry of Culture requires geomechanical drilling and archaeological interpretation at the site of the medieval saltpans, now transformed into wetlands. Beyond its role as saltpans, Salina holds archaeological value due to late antique sarcophagi and a late antique embankment designed to prevent flooding of fertile areas.</p> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <input checked="" type="checkbox"/> A3.3 Historical heritage </div> <p>If yes, please describe the main features of this value</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>The historical significance of Salina lies in its past as saltpans, later transformed in the 1960s into an exclusive hunting ground for former Yugoslav President Josip Broz Tito.</p> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <input type="checkbox"/> A3.4 Architectonical heritage </div> <p>If yes, please describe the main features of this value</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>(max 500 characters)</p> </div>
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		<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <input style="width: 30px; height: 20px; margin-right: 5px;" type="checkbox"/> A3.5 Ethnological heritage </div> <p>If yes, please describe the main features of this value</p> <div style="border: 1px solid black; padding: 5px; min-height: 40px;"> (max 500 characters) </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <input style="width: 30px; height: 20px; margin-right: 5px;" type="checkbox"/> A3.6 Landscape heritage </div> <p>If yes, please describe the main features of this value</p> <div style="border: 1px solid black; padding: 5px; min-height: 40px;"> (max 500 characters) </div>																																														
A.4	Main threats and impacts for the biodiversity of the pilot wetland	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" rowspan="2">description of the threat</th> <th colspan="3">relevance of the impact</th> </tr> <tr> <th>low</th> <th>medium</th> <th>high</th> </tr> </thead> <tbody> <tr> <td colspan="2">Agriculture</td> <td style="text-align: center;">X</td> <td></td> <td></td> </tr> <tr> <td colspan="2">Residential & commercial development</td> <td style="text-align: center;">X</td> <td></td> <td></td> </tr> <tr> <td colspan="2">Energy production & mining</td> <td style="text-align: center;">X</td> <td></td> <td></td> </tr> <tr> <td colspan="2">Transportation & service corridors</td> <td style="text-align: center;">X</td> <td></td> <td></td> </tr> <tr> <td colspan="2">Over-exploitation, persecution & control</td> <td style="text-align: center;">X</td> <td></td> <td></td> </tr> <tr> <td rowspan="3" style="vertical-align: top;">Land use modification</td> <td>Abandonment</td> <td></td> <td style="text-align: center;">X</td> <td></td> </tr> <tr> <td>Intensification</td> <td style="text-align: center;">X</td> <td></td> <td></td> </tr> <tr> <td>Other</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	description of the threat		relevance of the impact			low	medium	high	Agriculture		X			Residential & commercial development		X			Energy production & mining		X			Transportation & service corridors		X			Over-exploitation, persecution & control		X			Land use modification	Abandonment		X		Intensification	X			Other			
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		Human intrusions & disturbance		X	
		Natural system modifications			X
		Invasive & other problematic species & genes		X	
		Pollution	X		
		Geological events	X		
		Climate change & severe weather			X
		Other	Please specify:		
A.5	Main reasons and expectations that underpin the governance process for the pilot area	<p>What are the main drivers for promoting a voluntary governance process like a Wetland Contract in the pilot area? (i.e. why to implement a governance process? why to adopt such kind of tool?)</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>The primary driver for promoting a voluntary governance process like a Wetland Contract in the Salina pilot area is the need for inclusive, collaborative management to address its ecological and cultural significance. The Public Institution responsible for managing the area seeks to engage a broader range of stakeholders from the island and surrounding aquatorium to gain a comprehensive understanding of the site’s challenges and opportunities. Historically inaccessible, Salina has been impacted by natural succession and climate change, affecting its biodiversity and habitats. A Wetland Contract fosters stakeholder involvement, including those previously uninvolved in conservation, to support ecological restoration, enhance resilience against environmental pressures, and ensure sustainable management of this culturally and ecologically valuable area.</p> </div> <p>What are the specific objectives and expected results from the Wetland Contract of the pilot area?</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>The Wetland Contract for the Salina pilot area aims to promote holistic wetland conservation, encompassing coastal zones and groundwater, by engaging diverse stakeholders through the Blue Forum for Wetland Conservation. Our objectives include amplifying wetland protection efforts,</p> </div>			

		<p>fostering a collaborative community of scientists and stakeholders, and enhancing the sustainability of blue and green infrastructure across the region, with Saline as a key focal area. Expected results include strengthened ecological resilience and stakeholder-driven conservation strategies.</p> <p>Which might be the role of the Wetland Contract for adaptation of pilot wetland to Climate Change?</p> <p>The Wetland Contract for Saline’s adaptation to climate change plays a pivotal role by fostering active involvement of all stakeholders even indirectly connected to the area, ensuring continuous cooperation between the Public Institution and stakeholders. It promotes a better-maintained wetland through targeted management tools designed to combat climate change threats, such as droughts. It supports a well-maintained wetland through management tools tailored to address climate impacts, including adaptive water-level management, water quality control strategies, and habitat restoration. Additionally, it supports the development of high-quality educational activities to raise awareness and build resilience, enhancing the sustainability of Saline’s ecosystems.</p>																				
A6	Auto evaluation of the global knowledge level for the target area and additional information	<p>How do you evaluate the level of information regarding the target area?</p> <table border="1"> <tr> <td>Very poor</td> <td>Poor</td> <td>Sufficient</td> <td>Rich</td> <td>Complete</td> </tr> <tr> <td></td> <td></td> <td></td> <td>X</td> <td></td> </tr> </table> <p>How do you evaluate the quality of information regarding the target area?</p> <table border="1"> <tr> <td>Very low</td> <td>Low</td> <td>Sufficient</td> <td>High</td> <td>Very high</td> </tr> <tr> <td></td> <td></td> <td>X</td> <td></td> <td></td> </tr> </table> <p>How do you evaluate the level of information on CC regarding the target area?</p>	Very poor	Poor	Sufficient	Rich	Complete				X		Very low	Low	Sufficient	High	Very high			X		
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			X																			
Very low	Low	Sufficient	High	Very high																		
		X																				

Very poor	Poor	Sufficient	Rich	Complete
	X			

How do you evaluate the quality of information on CC regarding the target area?

Very low	Low	Sufficient	High	Very high
		X		

Please describe additional information you consider relevant not already in this report

(max 500 characters)

Please describe additional field of investigation you consider relevant for the target area to be added

Through the project, our pilot activities identified the need for additional fine-scale research on water parameters, flora, fauna, and hydrology to support effective conservation and management of Salina's habitat.