



Programma di Gestione e Conservazione delle  
Zone Umide  
PZU No.: GFP-001

REV.	Descrizione			
00	Prima emissione documento			
01	Revisione come da commenti ricevuti in data 18/09/2024			
02	Revisione come da commenti ricevuti in data 27/09/2024			
02	01.10.24	S.Caramia	S.Pozzato	P.Pasolini
01	24.09.24	S.Caramia	S.Pozzato	P.Pasolini
00	05.09.24	S.Caramia	S.Pozzato	P.Pasolini
REV.	DATA	PREPARATO	REVISIONATO	APPROVATO

## Sommario

1.	INTRODUZIONE	4
1.1	Obiettivi del programma	4
1.2	Campo di applicazione:	4
2.	DESCRIZIONE DEL PROGRAMMA	6
2.1	Contesto e motivazioni:	6
2.2	Struttura organizzativa:	6
2.3	Partecipanti e stakeholders:	6
3.	PIANIFICAZIONE DEL PROGRAMMA	6
3.1	Strategia e approccio metodologico:	6
3.2	Criteri di selezione dei progetti:	7
3.3	Timeline e milestones:	8
4.	IDENTIFICAZIONE E SELEZIONE DELLE SORGENTI E SERBATOI DI GHG	11
4.1	Criteri d'identificazione	11
4.2	Criteri di rilevanza e materialità:	12
5.	QUANTIFICAZIONE E MONITORAGGIO DELLE EMISSIONI E DELLE RIMOZIONI DI GHG	12
5.1	Metodologie di quantificazione:	12
5.2	Strumenti e tecnologie di monitoraggio:	12
5.3	Piani di raccolta dati:	13
6.	GESTIONE DELLA QUALITA' DEI DATI	13
6.1	Controlli interni e procedure di verifica:	13
6.2	Gestione delle incertezze:	13
6.3	Procedure di audit:	13
7.	RENDICONTAZIONE	14
7.1	Formati e template di report:	14
7.2	Frequenza della rendicontazione:	14
7.3	Meccanismi di revisione e feedback:	14
8.	VERIFICA E VALIDAZIONE	15

8.1	Requisiti per la verifica indipendente:	15
8.2	Criteri di validazione:	15
8.3	Pianificazione delle attività di verifica:	15
9.	GESTIONE DEL RISCHIO E MIGLIORAMENTO CONTINUO	16
9.1	Identificazione e mitigazione dei rischi:	16
9.2	Procedure di miglioramento continuo:	16
9.3	Indicatori di performance:	16
10.	REGISTRO CREDITI DI CARBONIO	16
10.1	Descrizione:	16
10.2	Caratteristiche:	17
10.3	Funzionalità:	17
11.	CONCLUSIONI E RACCOMANDAZIONI	19
11.1	Sintesi dei risultati attesi:	19
11.2	Raccomandazioni per il futuro:	19
12.	APPENDICI	20
12.1	Glossario dei termini:	20
12.2	Riferimenti normativi:	23

## 1. INTRODUCTION

### 1.1 Program Objectives

The program aims to reduce greenhouse gas (GHG) emissions and enhance their removal through sustainable management of Italian wetlands. Objectives include protecting biodiversity, mitigating the effects of climate change, and improving the quality of wetland ecosystems. These objectives will be pursued through the implementation of advanced management practices and the promotion of conservation initiatives.

### 1.2 Applicability

The programme is applicable to projects in Italian wetlands with high biodiversity and carbon sequestration potential, including areas such as marshes, peat bogs, lakes. Areas crucial for the ecological balance and reduction of GHG emissions at national level. The programme is applicable to projects that protect an area greater than 180 ha, where it is clear that any financial contribution derived from the sale of Carbon Credits generated by the project itself will support the financing of maintenance and improvement activities. Improvement activities include the application of devices aimed at increasing the accuracy of monitoring activities, the application of systems for the reduction of emissions generated by the use of energy and fuel (e.g. photovoltaic panels, electric propulsion engines and any innovative technological solutions), the planting of new plants, the minimisation of reclamation activities and the restoration of canals and embankments. The Proponent shall demonstrate that the proposed project needs the contribution generated by the sale of Carbon Credits for at least one of the following reasons:

- **Financial Barrier:** a financially more advantageous alternative to the current project would have generated more greenhouse gas emissions into the atmosphere.

- **Technological Barrier:** a technologically less advanced and therefore less costly alternative, also in terms of risk management, would have generated a greater share of greenhouse gas emissions.
- **Barrier by established practice:** established practice, regulatory and policy requirements were not sufficient to stimulate the implementation of innovative projects.
- **Other:** elements such as institutional barriers or lack of information, limited organisational capacity, managerial and financial resources, or the ability to absorb new technologies, would have generated more greenhouse gas emission.

The Project Proponent must guarantee total and absolute adherence to PZU Programme No.: GFP-001 for at least 10 years from project validation. This time window has been identified as the minimum threshold to ensure that the project activities can be sustained over time, even after project completion, and thus create a concrete positive environmental impact. The Proponent, through the implementation of the project, will therefore have to demonstrate that the following risks can be avoided:

- **Deforestation:** the project shall be protected and no unauthorised deforestation shall occur. Exceptions are extreme weather events that are not the responsibility of the proponents.
- **Land Use Change:** the submitted project scope shall not change over time, except for drastic changes that are duly justified and following which an analysis will be conducted to confirm adherence to the requirements of the programme.

They must also ensure the continuous monitoring of the project area, the proper implementation of the submitted activities and their effectiveness. In order to demonstrate that the project has been monitored, Proposers must provide an annual report, containing all information on the project's progress, the success rate of the implemented activities, the critical issues encountered, and the congruence with the expected results for the analysed period.

## 2. PROGRAM DESCRIPTION

### 2.1 Background:

Wetlands play a key role in absorbing atmospheric carbon, filtering water, and preventing flooding/marine ingress. However, they are particularly vulnerable to anthropogenic activities, such as urbanisation, intensive agriculture, and climate change, which undermine their ecological functionality, context and rationale.

### 2.2 Organisational Structure:

2.3 The programme is managed by a coordinating committee composed of experts in ecology, natural resource management, and climate change. The committee includes representatives from government agencies, universities, non-governmental organisations, and local communities, ensuring integrated and collaborative management.

### 2.4 Participants and stakeholders:

The programme involves a wide range of stakeholders, including public institutions, local communities, NGOs, research organisations, and other relevant actors. The active involvement of all participants is essential to the success of the programme.

## 3. PROGRAM PLANNING

### 3.1 Strategy and methodological approach:

The programme's methodological approach includes the initial assessment of GHG emissions and removal potential, the planning of interventions for the conservation and sustainable management of wetlands, and the continuous monitoring of results. This approach is based on scientifically validated practices and the adoption of innovative technologies for monitoring and managing natural resources.

### 3.2 Projects' Selection Criteria:

Project selection within the programme is based on strict criteria to ensure that the wetlands chosen are those that can make the greatest contribution in terms of ecological conservation and reduction of greenhouse gas emissions. The main selection criteria include:

- **Carbon sequestration capacity:** Project areas should show a high potential for carbon sequestration. This can be assessed by analysing the type of vegetation present, the depth and composition of the soil, and the presence of ecosystems with high carbon storage capacity, such as peat bogs or mangroves.
- **Degradation Status:** Project areas that show signs of degradation, such as loss of biodiversity, soil erosion, saline intrusion, or reduction of water capacity, may be prioritised for restoration and conservation work. The degree of degradation will be assessed through field surveys, historical analysis, and satellite data.
- **Ecological Relevance:** Sites that host critical habitats for threatened or endemic species, or that perform key ecological functions, such as coastal protection, water cycle regulation, and natural water filtration, are considered a priority. The presence of these features can be confirmed through ecological studies and environmental mapping.
- **Ecological connectivity and landscape integration:** Project areas will be evaluated in terms of their connectivity with other natural ecosystems, such as forests, rivers, or other wetlands. Areas that can contribute to the creation of ecological corridors or improve landscape continuity are particularly valued.
- **Conversion or Loss Risk:** Project areas at risk of loss or conversion to other land uses, such as urbanisation or intensive agriculture, are considered high priority. The selection will give priority to sites that need immediate protection to prevent conversion or destruction.
- **Community interest and Access:** Preference is given to sites where there is a strong local community interest in conservation and sustainable resource management. The possibility of access

and the existence of local facilities for site management and maintenance are also key factors.

- **Favourable hydrological conditions:** Project areas with stable and natural hydrological regimes are preferable, but areas that, although impaired, show potential for hydrological restoration through management interventions are also considered. This includes the assessment of water quality, the stability of water levels, and the possibility of sustainable water management.
- **Compliance with existing conservation plans:** Project areas that are already identified as priority conservation areas in regional, national or international plans are eligible. This includes sites recognised as Special Protection Areas (SPAs), Sites of Community Importance (SCIs), or Ramsar areas.

These programme parameters make it possible to identify wetlands that not only have a high ecological value and carbon sequestration potential, but can also benefit significantly from the conservation and sustainable management interventions provided by the programme.

### 3.3 Timeline and milestones:

The eligible project under PZU Programme No.:GFP-001 will be subject to 5 phases, each of which is characterised by specific milestones that mark progress towards quantification of greenhouse gas (GHG) absorptive capacity, identification and management of improvement interventions, third-party verification and validation, and quantification and marketing of carbon credits through Natural Capital Carbon Registry (NCCR).

The timeline covers a five-year period and includes the following phases and milestones:

#### **Phase 1: Site Selection and Planning**

- **Milestone 1.1:** Completion of the selection process for eligible sites, using ecological and technical criteria to identify wetlands with the greatest potential for carbon sequestration and biodiversity conservation.



- **Milestone 1.2:** Finalisation of action plans for each selected site, including budgets, necessary resources, and strategic partnerships. Definition of operational and logistical-organisational priorities for the implementation of the actions.

## **Phase 2: Preliminary Studies and Baseline Data Collection**

- **Milestone 2.1:** Completion of preliminary ecological studies for all selected sites. These studies include in-depth analysis of soil, water quality, biodiversity composition, and land use in order to collect essential data for quantifying GHG emissions.
- **Milestone 2.2:** Stabilisation of the baseline for GHG emissions and key ecological indicators. Collect and archive initial data on which to base comparisons with subsequent results. This phase also includes detailed mapping of sites using GIS and other remote sensing technologies.

## **Phase 3: SSR Identification and Credits quantification data calculation**

- **Milestone 3.1:** Identification of greenhouse gas sources, sinks and removals (SSR) at each site. This process includes determining carbon flows and detecting direct and indirect emissions through the analysis of collected data and the use of specific models for wetlands.
- **Milestone 3.2:** Calculation of GHG emissions and removals at each site, using IPCC guidelines and other recognised methodologies. This calculation will enable the accurate quantification of carbon credits generated or potential emission reductions.
- **Milestone 3.3:** Internal validation of data and preliminary review of calculations, ensuring that all variables have been correctly considered and that the results are consistent with the programme's objectives.

## **Phase 4: Improvement and Implementation Plans Definition**

- **Milestone 4.1:** Development of improvement plans for each site based on the results of carbon credit quantification and the specific ecological needs of each area. The plans will include measures aimed at maximising carbon sequestration capacity and improving ecosystem quality.
- **Milestone 4.2:** Implementation of improvement measures at the sites, with continuous monitoring to verify the effectiveness of the actions taken. Improvement activities include water management, habitat restoration, and other sustainable ecological practices.

**Phase 5: Monitoring, Validation and Verification, Results sharing and Quantification and Commercialisation of Carbon Credits (Months 43-60)**

- **Milestone 5.1:** Continuous monitoring of sites to assess the effectiveness of the measures implemented, with constant review of GHG emissions and ecological indicators. This phase includes the collection of post-intervention data for comparison with the baseline.
- **Milestone 5.2:** Completion of the final project impact assessment, with a particular focus on the amount of carbon credits generated, biodiversity improvement, and the ecological resilience of wetlands.
- **Milestone 5.3:** Production of the final report and dissemination of results to stakeholders, local communities, and institutions. Planning of next steps for programme continuity and extension to other potentially eligible areas.
- **Milestone 5.4:** Quantification and marketing through the Natural Capital Carbon Registry (NCCR) to provide financial support for project management, maintenance, and improvement activities.

This detailed timeline, with clearly defined phases, ensures a systematic and rigorous approach to wetland management, from data collection to carbon credit quantification and the implementation of improvement

measures. However, the project may have a differently structured timeline, provided that this is justified by the project proponent and approved by the coordinator.

## 4. GHG SOURCES AND RESERVOIRS IDENTIFICATION AND SELECTION

### 4.1 Identification Criteria

The programme provides for a detailed inventory to identify the main sources of GHG emissions and natural carbon sinks in wetlands. This inventory is the starting point for planning management and conservation activities. For wetlands, emissions from anaerobic decomposition, peatland drainage and hydrological changes must be reported, in addition to carbon storage in soils and biomass. (IPCC 2006 Guidelines for National Greenhouse Gas Inventories, Volume 4: Agriculture, Forestry and Other Land Use (AFOLU), in particular Chapter 7: Wetlands), the IPCC 2013 Wetlands Supplement supplements this information by providing methodologies for reporting emissions.

### 4.2 Materiality and Relevance Criteria:

The programme evaluates the selection of project sources and sinks against relevance criteria, including carbon storage capacity, vulnerability to climate change, and the ecological importance of the area. Modelling and analysis tools are used to ensure that all relevant sources and sinks are identified and monitored.

## 5. GHG EMISSIONS AND REMOVALS QUANTIFICATION AND MONITORING

### 5.1 Methodology and quantification:

Quantifying GHG emissions and removals is essential for assessing the effectiveness of the programme.

To be eligible for the programme, the project must be based on internationally recognised scientific calculation methodologies,

such as the IPCC guidelines, etc. These methodologies must include estimates of emissions from the decomposition of organic matter, human activities and interactions between the various components of the ecosystem.

## 5.2 Monitoring Tools and Technologies:

In order to be eligible for the programme, the project must provide for continuous monitoring of GHG emissions and removals through the use of advanced technologies such as remote sensing systems, GIS (Geographic Information Systems), drones, and environmental sensors. These tools enable real-time data collection on environmental conditions and GHG emissions, providing a detailed and up-to-date view of the current and historical situation of wetlands.

## 5.3 Data collection plans:

The project must implement a detailed plan that includes at least the following points: the definition of sampling areas, the frequency of measurements, and data management procedures. The plan ensures that data is collected in a systematic and consistent manner, providing a solid basis for analysis and reporting. The data collected will be stored and made available to programme participants for analysis and sharing. The frequency of collection will be determined based on the characteristics and morphology of the project area.

# 6. DATA QUALITY MANAGEMENT

## 6.1 Internal Audits and Verification procedures:

The programme requires that data quality is ensured through a system of internal controls. Each stage of the project's data collection and analysis process is subject to checks to ensure its relevance and relevance. Regular internal audits are carried out to identify and correct any anomalies in the data collection process.

## 6.2 Uncertainties Management:

Uncertainties in measurements and estimates of GHG emissions and removals are managed through the use of advanced statistical methodologies and modelling techniques. These techniques allow uncertainty to be quantified and minimise the impact on overall results. Uncertainty mitigation strategies are also adopted, such as the use of high-quality data and regular calibration of measurement instruments.

## 6.3 Audit Procedures:

External and internal audit procedures are essential to ensure the transparency and credibility of the programme. External audits are conducted by a third party to verify the programme's compliance with the ISO 14064-2 standard. Internal audits, conducted by the coordination committee, ensure that the programme is followed and implemented accurately and efficiently.

# 7. REPORTING

## 7.1 Reporting formats and templates:

Reporting on the results of projects participating in the programme follows the standardised PZU Template No.: GFP-002 to ensure clarity, consistency and transparency. Reports include details on programme progress, GHG emissions and removals, actions taken and results achieved. Each report is divided into specific sections to facilitate consultation and analysis by stakeholders.

## 7.2 Reporting Frequency:

The programme requires that the frequency of reports be stated in the project document and at key programme milestones. This frequency ensures that progress is monitored regularly and that any issues can be identified and resolved promptly. Frequent reporting also keeps stakeholders informed and ensures transparency in programme operations.

### 7.3 Feedback and Review Mechanisms:

The programme requires that project reports be reviewed by the coordination committee and external experts to ensure the accuracy and relevance of the information provided. Feedback mechanisms are established to allow stakeholders to express their opinions and suggestions on the reports. The feedback received is integrated into the programme's continuous improvement process, ensuring that reporting practices evolve in line with stakeholder needs and international best practices.

## 8. VERIFICATION AND VALIDATION

### 8.1 Independent Verification Requirements:

Independent verification is a key element in ensuring the reliability and credibility of programme results. Each project within the programme is subject to verification and validation by an ISO 14064-2 accredited third-party body. The body will conduct thorough assessments to verify that GHG emissions and removals have been quantified correctly in accordance with the reference standard.

### 8.2 Validation Criteria:

The programme validation criteria include data accuracy and completeness, compliance with approved methodologies, and transparency in the reporting process. Validation ensures that projects effectively contribute to GHG emission reductions and removal enhancements. Validation is carried out at the beginning of the project and during key milestones, ensuring that each phase of the project complies with the requirements.

### 8.3 Verification activities planning:

Verification activities to ensure compliance with the programme are strategically planned to cover all critical phases of the project. Planning includes defining the time and resources required for verification, as well as selecting accredited verification bodies. Regular verification allows any problems to be identified promptly and the necessary corrections to be made to ensure the success of the project.

## 9. RISK MANAGEMENT AND CONTINUOUS IMPROVEMENT

### 9.1 Risks identification and mitigation:

Risks associated with the programme, such as unexpected climate change, technical problems or regulatory changes, are identified and assessed at the start of the programme. Mitigation strategies are developed for each identified risk, including the adoption of resilient technologies, diversification of funding sources and continuous updating of management practices.

### 9.2 Continuous Improvement Process:

The programme includes a regular review of the practices implemented and the results achieved. Based on lessons learned and feedback received, changes are made to improve the effectiveness of the actions taken. Continuous improvement is integrated into the programme through a cycle of planning, execution, verification and corrective action.

### 9.3 Performance indicators:

Specific indicators are used to monitor the effectiveness of the programme. These include the amount of GHG reduced or removed, the quality of wetland ecosystems, and the degree of involvement of local communities. The indicators are monitored regularly and the results are used to inform management decisions and adapt intervention strategies.

## 10. CARBON CREDITS REGISTRY

### 10.1 Description:

The Natural Capital Carbon Registry (NCCR) is a platform designed to securely record, track and manage carbon credits generated by environmental projects. It is the registry chosen by the programme. Using blockchain technology, it guarantees a high level of transparency and security for transactions. Below is a general description of the registry's features and functionalities.

### 10.2 Characteristics:

The programme registry is designed to track carbon credits generated by Italian environmental projects validated and verified in accordance with ISO 14064-2. In addition to meeting the requirements of ISO 14064-2, credits must also support biodiversity conservation and be part of a long-term project. Project developers and coordinators may be landowners ('Landowners') or any consulting companies appointed by them.

Buyers will have access to the Natural Capital Carbon Registry (NCCR) through Green Future Project ("GFP"). GFP will act as an agent for landowners in identifying buyers. Buyers will be companies seeking to acquire credits generated by projects validated and verified in accordance with ISO 14064-2 with the explicit intention of retiring these credits.

All carbon credits issued under the projects will be tokenised, which will result in the creation of semi-fungible tokens for each tonne of carbon recognised. The registry will provide real-time monitoring of all token transactions and make the transfer of ownership of each token visible. Once retired, the token will be permanently removed from circulation and the registry will track the buyer who retired the token. The registry, being blockchain-based, will be publicly visible.



### 10.3 Functionalities:

The registry uses blockchain technology to ensure the security and transparency of credit transactions for projects eligible for the programme. This ensures that all records are immutable and tamper-proof, providing a reliable system for credit management.

Each credit is represented by a semi-fungible token (SNFT) on the blockchain. These tokens are backed by certificates representing specific amounts of credits.

Credits are issued as tokens, each representing a predefined value. The process ensures that all tokens are accurately accounted for and securely stored.

The platform allows for token management, including tracking ownership, transferring ownership, and redeeming tokens as needed.

The platform facilitates the secure transfer of credit ownership via blockchain transactions. Each transfer is recorded, ensuring that the new owner's information is accurately updated and verifiable.

The system provides robust tracking capabilities, allowing users to monitor the movement and status of their tokens. This includes real-time updates and detailed transaction history.

The registry supports the permanent withdrawal of tokens, ensuring that they cannot be reused or double-counted. This process is essential for maintaining the integrity of the credit system. Token withdrawals are transparently recorded on the blockchain, including metadata such as the withdrawal timestamp and the last known owner, ensuring a clear and immutable record.

The platform features an intuitive front-end web application that includes functionality for issuing, transferring and retiring tokens, as well as viewing transaction history and current balances.

The platform includes robust authentication and authorisation mechanisms, such as login-protected areas, to ensure that only authorised users can access and carry out transactions.

All transactions and data are protected using industry-standard encryption and security protocols, ensuring the confidentiality and integrity of user information.

The ledger is built on a scalable architecture, leveraging Google Cloud services and Docker containerisation technologies for reliable performance and easy scalability.

Using relational SQL databases, the platform ensures efficient and secure data storage and retrieval, supporting the high demands of credit management.

## 11. CONCLUSIONS AND RECOMMENDATIONS

### 11.1 Summary of expected results:

The programme is expected to lead to a significant reduction in GHG emissions and an improvement in removal capacities in Italian wetlands. Expected results also include biodiversity conservation, improved water quality and increased awareness among local communities of the importance of wetlands.

### 11.2 Recommendations for the future:

Further actions are proposed to expand the programme and improve the results achieved. These include extending management practices to new areas, adopting innovative technologies and strengthening collaboration between various stakeholders. The recommendations are based on lessons learned during programme implementation and international best practices. The contribution derived from the commercialisation of carbon credits generated by the projects will support management and improvement activities.

## 12. APPENDICES

### 12.1 Glossary:

**GHG** - Greenhouse gases are gases present in the atmosphere that contribute to global warming by trapping heat radiated from the Earth's surface.

**Wetlands** - natural environments characterised by the presence of water, which may be permanent or seasonal, fresh, brackish or salty, ecosystems that include marshes, swamps, peat bogs, lagoons, ponds and river mouths.

**Carbon Credits** - negotiable certificates representing the reduction, avoidance or removal of one tonne of (CO<sub>2</sub>e) from the atmosphere.

**Proponent** - an individual, company or entity that submits a proposal for the assessment and validation of a project. This role involves the responsibility of clearly and comprehensively outlining the objectives, implementation and benefits of the project.

**Stakeholders** - individuals, groups or organisations that have an interest in or are affected by the activities related to the project.

**Special Protection Areas (SPAs)**: areas designated for the conservation of wild birds, particularly along migration routes, established under the European Union Birds Directive (79/409/EEC) with the aim of maintaining and managing suitable habitats for migratory bird populations.

**Sources, Sinks and Absorbers (SSR)**: Components of the environment that respectively emit, store or absorb greenhouse gases (GHG). Sources include activities such as the combustion of fossil fuels, while natural sinks can be forests and soils, which store carbon. Sinks are ecosystems, such as wetlands, that remove CO<sub>2</sub> from the atmosphere.

**Baseline** - An initial reference point established for GHG emissions and other key ecological indicators, against which the results of a project are measured. The baseline is essential for assessing the effectiveness of interventions to reduce emissions or improve carbon sequestration capacity.

**IPCC (Intergovernmental Panel on Climate Change)** - The United Nations organisation that provides scientific assessments on climate change. IPCC guidelines are widely used for quantifying GHG emissions and removals.

**ISO 14064-2** - An international standard that specifies requirements for the design and management of projects for reducing GHG emissions or increasing their removal. The standard is part of the ISO 14064 series, which focuses on the management and verification of greenhouse gas emissions.

Natural Capital Carbon Registry

**(NCCR)** - A platform designed to register, track and manage carbon credits generated by environmental projects. It uses blockchain technology to ensure transparency and security in transactions, enabling real-time monitoring and withdrawal of credits from the market.

**Monitoring** - The process of collecting and analysing data on GHG emissions, environmental conditions and the effectiveness of the measures implemented. Continuous monitoring is essential to verify that projects are meeting their targets and to make any necessary adjustments.

**Audit** - A systematic, independent and documented process for obtaining evidence and evaluating it objectively to determine the extent to which audit criteria are fulfilled. In the context of the programme, audits are used to verify compliance with ISO 14064-2 standards and the quality of the data collected.

**Biomass** - Organic material derived from plants and animals that can be used as an energy source. In wetlands, plant biomass contributes to carbon sequestration by storing CO<sub>2</sub> that would otherwise be released into the atmosphere.

**Ecological connectivity** - The ability of a landscape to allow the movement of species and genetic flow between fragmented habitats. It is a key concept for biodiversity conservation, especially in ecosystems such as wetlands.

**GIS (Geographic Information System)** - A computer system for acquiring, managing, analysing and visualising geographic data. It is used to map and monitor the ecological characteristics of wetlands and to support land-use planning and management.

**Critical Habitat** - Specific areas that are crucial for the long-term survival of threatened or endemic species. The protection of these habitats is essential for preserving biodiversity in wetlands.

**Quantification Methodologies** - Standardised procedures used to measure and calculate GHG emissions and removals. Methodologies must comply with international standards, such as those of the IPCC, to ensure data reliability and comparability.

**Mitigation** - Initiatives aimed at reducing or preventing the emission of greenhouse gases into the atmosphere. In the context of wetlands, mitigation may include the conservation of existing ecosystems, the restoration of degraded areas and the implementation of sustainable agricultural practices.

**Improvement Plans** - Strategies developed to increase the effectiveness of wetland management activities by improving carbon sequestration capacity, habitat quality

and ecological resilience. Improvement plans are tailored to the specific needs of each site.

**Ecological Restoration** - The process of assisting in the recovery of an ecosystem that has been degraded, damaged, or destroyed. In wetlands, ecological restoration may include restoring natural hydrology, removing invasive species, and reintroducing native species.

**Carbon Sequestration** - The process by which carbon is removed from the atmosphere and stored in natural reservoirs such as soils, forests, and plant biomass. Wetlands play a critical role in carbon sequestration due to their ability to store large amounts of organic matter.

**Stakeholder Engagement** - The active involvement of stakeholders in project decisions and activities. This process ensures that the interests of all stakeholders are considered and that there is collective support for the programme's initiatives.

**Independent Verification** - An assessment process conducted by a third party to confirm that GHG emissions have been quantified and reported in accordance with recognised standards, such as ISO 14064-2. Independent verification adds credibility to the programme's results and ensures transparency.

## 12.2 Regulatory References:

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