15th meeting of the Conference of the Contracting Parties to the Convention on Wetlands

"Protecting wetlands for our common future"
Victoria Falls, Zimbabwe, 23-31 July 2025

COP15 Inf.3

Report of the Secretariat on assessment of progress on wetland restoration: Full assessment report

Wetland degradation and loss continue at alarming rates, with as much as half of all wetland habitat types globally now lost or severely degraded.

Recognition of these losses is evidenced by national and organizational commitments to the restoration of millions of hectares of mangroves, reefs, inland waters, and coastal habitats.

Thousands of wetland restoration projects are currently underway across the globe, with nearly three-quarters of signatory countries involved in restoration activities at some level.

Long-term monitoring of restoration activities is essential to ensure continued ecological integrity, services, and function. However, a lack of coordination and limited implementation pose substantial challenges.

Building capacity among decision-makers and water resource managers, fostering cross-sectoral partnerships, and ensuring inclusive and participatory processes are key components for initiating restoration and monitoring, as well as long-term restoration success.

Lead Authors:
Gretchen Stokes and Sinomar Fonseca at the University of Florida, United States of America.

Introduction

Background

1. This report highlights the current state of, and progress towards, global wetland restoration in support of the direct request stated in Resolution XIV.6 of the Convention on Wetlands for the Secretariat to assess and report on global wetland restoration progress at the 15th Meeting of the Conference of the Contracting Parties (COP15). Additionally, it incorporates and advances insights from the 2018 Technical Note on Wetland Status and Trends, the 2021 Global Wetland Outlook, the recent publication entitled "Costs of wetland loss and degradation, and investment required to maintain and restore wetlands" (Convention on Wetlands, *in press*), and other relevant scientific literature. This work synthesizes existing knowledge, leverages existing global datasets, and contextualizes findings within international frameworks, which can provide actionable insights to guide and advance the goals of the Convention on Wetlands and other intergovernmental agreements and efforts. For example, links can be made to the United Nations (UN) Decade on Ecosystem Restoration (e.g., improving human well-being, slowing habitat degradation), Sustainable Development Goals (e.g., SDGs 6, 13, 15), the Kunming-Montreal Global Biodiversity Framework (KM-GBF) (e.g., Targets 2 (restoration), 11 (maintain and enhance NCPs), 8 (climate change), 7 (pollution)), and the European Union Restoration Law.

2. Intended deliverables for this report include
   i) a summary of degraded wetlands,
   ii) a summary of wetland restoration activities and commitments,
   iii) progress towards restoration using the KM-GBF Target 2 desired outcomes categories and available attributes, and
   iv) recommendations for next steps based on limitations and gaps in the assessment.

Context and need for wetland assessment

3. Wetlands (e.g., "areas of marsh, fen, peatland or water (natural or human-made wetlands; permanent or temporary; static or flowing; fresh, brackish or salt, including marine waters not exceeding six metres in depth" (Convention on Wetlands, 2016); provide essential ecosystem services, including regulating global climate, maintaining the hydrological cycle, safeguarding thousands of species, improving the quality and quantity of available water for human needs, and protecting regulating ecosystem services such as carbon sequestration.

4. Yet, despite their importance to human well-being, ecosystem regulation, and species biodiversity, the world's freshwater ecosystems are some of the most threatened on the planet. Sources estimate that as much as 3.4 million km² of inland wetlands have been lost since 1700, with a net loss of 21% of global wetland area (Fluet-Chouinard et al., 2023) and that nearly one-third of freshwater fish species are threatened with extinction (Sayer et al., 2025). As such, and recognizing the contributions and importance of global wetlands, numerous global non-governmental organizations (NGOs), intergovernmental organizations, and national governments have been considering strategies to reduce wetland degradation and promote restoration over the past few decades. Efforts include those by the Global Mangrove Watch, International Rivers, Global Peatlands Assessment, Wetlands International, the Society for Ecological Restoration (SER), the Society of Wetland Scientists, and the Global Coral Reef Monitoring Network.

5. Resolution XIV.6 highlights the need for a systematic evaluation of global wetland restoration efforts, to be primarily considered in the context of the Convention on Wetlands 4th Strategic Plan and other relevant targets established through resolutions adopted under the Convention. For instance, the following resolutions need to be considered in the context of this work, including principles and guidelines for wetland restoration (adopted as the annex to Resolution VIII.16 (2002): Recommendation 4.1: Wetland restoration; Recommendation 6.15: Restoration of wetlands; Resolution VII.17: Restoration as an element of national planning for wetland conservation and wise use; Resolution VIII.16: Principles and guidelines for wetland restoration; Resolution XII.11: Peatlands, climate change and wise use: Implications for the Convention of Wetlands; Resolution XIII.13: Restoration of degraded peatlands to mitigate and adapt to climate change and enhance biodiversity and disaster risk reduction; and potentially COP14 resolutions.

6. Consideration of frameworks such as Target 2 of the KM-GBF can be useful as well. Numerous recent efforts have worked to include fresh waters more directly into the KM-GBF, as well as inland fisheries. This work also aligns with other multilateral environmental agreements (MEAs) and restoration initiatives, including the Land Degradation Neutrality targets under the joint agreement with the UN Convention to Combat Desertification and the Convention on Wetlands, the SDGs (e.g., 15.1), the UN Decade on Ecosystem Restoration, the Global Environmental Facility (GEF) Ecosystem Restoration Integrated Program, and the Global Restoration Commitments and Pledges. Key global efforts, including the UN Decade and Freshwater Challenge, guide this analysis and highlight the urgency and scope of wetland restoration as a priority.

Purpose and objectives

7. The purpose of this work is to deliver a global assessment of progress on wetland restoration in response to Resolution XIV.6 of the Convention on Wetlands. First, existing data on wetland status and trends are compiled, with a focus on wetland degradation, loss, and restoration (recognizing sites where wetlands have been lost can be good targets for restoration). Second, global restoration commitments, efforts and outcomes are identified and assessed. Third, recommendations for accelerating restoration and improving monitoring mechanisms are provided. The contents of this report are divided into four sections:

   Section 1: Wetland degradation and loss

   OBJECTIVE 1: Estimate the area of degraded wetlands globally

   i) Compile available estimates of degraded wetland area.
   ii) Identify the extent of degraded wetlands and trends by wetland type and geographical regions.

   Section 2: Wetland restoration targets and commitments

   OBJECTIVE 2: Compile and analyse information on wetland restoration targets and commitments

   i) Identify the extent of, and trends in, wetland restoration targets and commitments, by wetland type and geographic regions.
   ii) Compare national targets and other commitments with globally established goals and targets.

   Section 3: Restoration efforts

   OBJECTIVE 3: Review existing initiatives, databases, and reports that track restoration efforts

   i) Compile available information on wetland restoration.
   ii) Identify wetland restoration extent and trends by wetland type, geographical region, and scale.

Section 4: Recommendations and gaps

OBJECTIVE 4: Identify and map ongoing restoration efforts globally

i) Assess progress made towards restoration and alignment with international commitments, including evaluation of stated goals with actual activities on the ground.

ii) Identify critical gaps, needs, and priorities for future action.

Approach and Key Concepts

Defining wetland restoration

8. The concept of ecological restoration can be traced back to early relationships between humans and nature and has evolved from a focus on improving degraded ecosystems (Berger 1987), to including values (Higgs, 1994), ecosystem structure and function (CBD 2016), and integration of people and nature (Martin, 2017) (Supplemental Table 1). Across these definitions, several principles of restoration are noteworthy in the context of this report. First, restoration typically implies a process or set of activities, rather than a stand-alone product. Second, in most cases, restoration implies improvement in the condition of an ecosystem (e.g., renewing damage, recovering degradation, restoring attributes). Third, because of the first and second dimensions, it is implied that restoration involves a temporal component (i.e., a process occurring over time to change the state of an ecosystem). Considering these dimensions of a process, a state change, and a temporal scale, restoration, therefore, proves to be inherently challenging to measure. Measuring restoration activities, success, or progress can be subjective in understanding a state change and identifying the target output (e.g., ecosystem function restored, ecosystem services improved). For example, an ecosystem may be progressing towards restoration from dam removal but the ecosystem impacted by restoration may not show signs of true improvement for many years.

9. The definition of ecological restoration from the Society for Ecological Restoration (SER, 2004), "the process of helping an ecosystem recover from damage, degradation, or destruction", is broadly used across global efforts and was modified by the UN Decade to define ecosystem restoration as "the process of halting and reversing degradation, resulting in improved ecosystem services and recovered biodiversity" (UNEP & FAO, 2023). Importantly, the KM-GBF calls for bringing 30% of degraded ecosystems "under effective restoration" (rather than aiming to fully restore 30% of degraded ecosystems) by 2030. While nuanced, this difference is noteworthy, where the goal does not require areas to be restored, given the long-term process involved for restoration, but rather requires initiation of effective restoration activities. Effective restoration is defined as standards-based restoration that achieves balanced net gain for people and nature (FAO, SCBD & SER, 2024). Although the Convention on Wetlands does not adopt this level of specificity to its definition or guidance, it is relevant to Parties undertaking effective restoration to meet the global targets.

10. The Convention on Wetlands defines restoration in its broadest sense, including activities that promote a return to previous conditions, as well as activities that improve wetland function, without necessarily seeking to return it to its pre-disturbance condition, as this may not always be possible (Resolution VIII.16; 2002). This definition is problematic as it focuses on a return to previous conditions. Because ecosystems are dynamic, the restoration community has tried to focus on ecological and ecosystem restoration as something that puts an ecosystem back on its pre-degraded trajectory (e.g., not back to its previous condition, but to its previous trajectory). This view, in turn, accommodates global environmental changes, including climate change.

11. Further, the Convention on Wetlands recognizes restoration as an element in national planning for wetland conservation (Resolution VII.17; 1999). The Convention also endorses the following principles in relation to restoration: (a) return to pre-disturbance conditions is not necessarily implied or required in restoration activities (Resolution XI.9, 2012), (b) conservation of existing wetlands is preferable to restoration (Recommendation 4.1; 1990), (c) the appropriate scale for restoration planning is at the catchment level (Resolution VIII.16; 2002), (d) adaptive management should be applied to restoration projects (Resolution VIII.14), and (e) long-term stewardship via ongoing management and monitoring is required (Annex to Resolution VI.1) (Table 1).

Synthesis of previous Convention on Wetlands efforts

12. The Convention on Wetlands has advanced, and continues to advance, the understanding of wetland restoration and principles and guidelines for wetland restoration (Table 1). Table 1 provides key sources of long-term commitment to advance wetland restoration by the Convention on Wetlands and other global agencies. Many of the sources include specific policies and highlight the urgent importance of wetland restoration efforts.

Table 1: Synthesis of work (N=17) by the Convention on Wetlands to advance the understanding of wetland restoration and inform the development of guidelines and principles for wetland restoration.

Category	**Output**	**Brief summary**
General wetland restoration priorities, principles and guidance	Recommendation 4.1: Wetland restoration (COP4, 1990)	Urges Parties to establish and operationalise wetland restoration projects with institutional commitments.
	Recommendation 6.15: Restoration of wetlands (COP6, 1996)	Promotes integration of restoration into national environmental policies and identification of key restoration sites.
	Resolution VII.17: Restoration as an element of national planning for wetland conservation and wise use (COP7, 1999)	Recognises restoration as essential to national wetland strategies.
	Resolution VIII.16: Principles and guidelines for wetland restoration (COP8, 2002)	Provides tools, principles, and planning methods for wetland rehabilitation.
Wetland type or purpose-specific guidance	Resolution XIII.13: Restoration of degraded peatlands to mitigate and adapt to climate change and enhance biodiversity and disaster risk reduction (COP13, 2018)	Addresses peatland restoration as a strategy for climate action, biodiversity, and disaster risk reduction.
	Resolution XIII.14: Promoting conservation, restoration and sustainable management of coastal blue-carbon ecosystems (COP13, 2018)	Addresses blue carbon ecosystems - mangroves, salt marshes, and seagrass beds.
	Resolution XIV.15: Enhancing the conservation and management of small wetlands (COP14, 2022).	Encourages the development of national and local plans to promote the conservation, restoration, and wise use of small wetlands.

	Resolution XIV.17: The protection, conservation, restoration, sustainable use and management of wetland ecosystems in addressing climate change (COP14, 2022)	Emphasises the role of wetlands in climate change mitigation and adaptation, urging integration into climate policies.
	Technical Report 11: Global guidelines for peatland rewetting and restoration (2021)	Offers detailed technical advice on peatland restoration interventions.
	Briefing Note 3: Avoiding, mitigating, and compensating for loss and degradation of wetlands in national laws and policies (2012)	Provides legal and policy examples from Contracting Parties on applying the "avoid-mitigate-compensate" sequence to minimize wetland degradation and loss.
	Briefing Note 4: The benefits of wetland restoration (2012)	Summarises convention guidance and raises awareness.
	Policy Brief 5: Restoring drained peatlands: A Necessary Step to Achieve Global Climate Goals (2021)	Links peatland restoration to climate and biodiversity targets.
	Briefing Note 10: Wetland restoration for climate change resilience (2018)	Highlights restoration's role in climate responses.
	Briefing Note 11: Practical peatland restoration (2021)	Provides methods and techniques for peatland rewetting and recovery.
Awareness and advocacy materials	Factsheet: Wetlands restoration: Unlocking the untapped potential of the earth's most valuable ecosystem (2021)	Provides general awareness on wetland values and restoration.
	Factsheet: Restoring drained peatlands: Now an environmental imperative (2021)	Communicates peatland restoration importance and approaches.
	Factsheet: Realizing the full potential of marine and coastal wetlands: Why their restoration matters (2021)	Highlights coastal wetland benefits and restoration potential.

Wetland classification

13. For the purposes of this report, the wetland classification system developed by the Convention on Wetlands is used, which includes three broad categories: marine and coastal wetlands (Cadier et al., 2020), inland wetlands, and human-made wetlands (Convention on Wetlands, 1990). Among global efforts, the Convention on Wetlands uses one of the broadest definitions of wetlands (including marine areas 6m deep or shallower, e.g., coral reefs), while many other studies and contexts refer to a narrower definition (e.g., wetlands as peatlands, wetlands in freshwater areas only). Often, wetlands are considered semi-aquatic ecosystems with water or waterlogged soils for periods of time. The opportunity in using the broadest definitions of wetlands for this assessment is that it allows for a larger synthesis of existing material, including coastal and marine areas, while the challenge becomes the synthesis of datasets utilizing varying definitions and classifications systems. Therefore, congruent definitions and consistent reporting standards are important considerations for reporting by the Convention on Wetlands.

Spatial and temporal considerations

14. Wetland restoration is a critical environmental endeavor aimed at reviving and sustaining the ecological functions and services provided by these vital ecosystems. Given the complexities in defining restoration, additional spatial and temporal dimensions must be considered in the assessment of restoration progress. Considerations include delineation of boundaries for reporting restoration activities, quantification of restoration area across watershed scales, integration of disparate data sources, identification of target attributes for restoration activities, and definition of a baseline and temporal bounds for restoration progresses (Table 2).

Table 2: Spatial and temporal considerations involved in evaluating wetland restoration.

Considerations	Description	Opportunities / Recommendations
Geopolitical boundaries vs. watershed boundaries; overlapping restoration areas from nearby activities	Data are often reported by countries as national statistics, yet most large river systems and many lakes are transboundary and cannot be measured exclusively using country boundaries.	Use of catchment boundaries instead of national boundaries is preferred (e.g., HydroBASINS) to capture restoration efforts within functional ecosystem units; catchment boundaries often align across tools to increase usability.
Distinguishing, measuring, and accurately quantifying *area of active intervention* and *area of intended benefits*	Area of intended benefits (i.e., area impacted by restoration) is often much larger than the footprint of the area of active intervention (area of restoration focal area activities) and may span beyond the boundaries of a tributary or lake into the broader watershed and can have substantial downstream or lateral effect to the ecosystem.	Area under active intervention should focus on the footprint of the treatment area, whereas the area of intended benefits includes the footprint of the overall impact area. Projects and planning teams should consider each of these components and report as such.
Using "area under effective restoration" is the most appropriate and standardized metric for wetlands	Measuring restoration success can be highly dependent on the target ecosystem attribute. Restoration activities often have a target attribute (e.g., ecosystem function, ecosystem structure, improved biodiversity) but because these can be variable, comparing restoration across areas is inconsistent.	Area under restoration as area of intended benefits should include the largest encompassing watershed that captures the downstream effects of the activity and the area upstream (e.g., important to look at wetland restoration impact and not just the restoration activity site).
Defining a baseline (condition prior to treatment), reference (historical condition), and target goal should be carefully considered	Setting a baseline (starting point of the ecological condition to which progress towards ecological restoration may be compared) and setting a target goal (e.g., the state to which the ecosystem is targeted for restoration efforts) may vary depending on metrics and perceptions of pre-treatment condition.	Presenting a synthesis and comparison of multiple sources using different time scales can be used to understand broad patterns; for the purposes of reporting for Target 2, 2010 to 2020 is a reference; in contrast, baselines can be considered as pre-treatment condition.
Defining the timeframe over which improvement occurs	Some activities may see immediate improvement while others may be initially	Getting to full recovery may take a long time and is variable, but indicators of a trajectory toward

and the trajectory of ecosystem recovery may be highly variable	unquantifiable and require a longer timeframe for evaluation.	restoration are valuable, particularly in the short term; some changes are difficult to quantify because of natural variability; expectation to document progress quickly or clearly should be tempered.

Approaches and considerations for defining area under restoration

15. The FAO and a wide range of collaborators have proposed a definition of area impacted by restoration (area of intended benefits) for freshwater (inland waters) ecosystems as "the area over which the restoration underway is expected to provide any of the outcomes identified under Target 2" (Steel et al., 2025). The goals of Target 2 include enhancing biodiversity, enhancing ecosystem functions and services, enhancing ecological integrity, and enhancing connectivity. This report utilizes these four desired outcomes (KM-GBF) as the framework for evaluating progress towards global wetland restoration. Given the challenges with conceptualizing and indicating restoration, the four desired outcomes provide a measurable set of indicators with the understanding that there is not a single (one-size-fits-all) approach for measuring restoration activities or progress.

16. The Convention on Wetlands distinguishes the following terms, which are used throughout the report when referring to area under restoration and area restored: *area of active intervention* (e.g., area being treated, area with on-the-ground activities) and *area of intended benefits* (e.g., area intended for impact, where enhancements are expected). As such, for flowing freshwater (inland waters) ecosystems, the area under restoration should be considered as the aggregate of three types of potential areas: (1) the direct area of on-the-ground restoration activity; (2) the upstream area expected to benefit from improved biodiversity; and (3) the downstream and lateral areas expected to see enhanced biodiversity or enhanced water quality and flows (Steel et al., 2025). For non-flowing freshwater ecosystems, the area under restoration should be considered as the aggregate of three types of potential areas: (1) the direct area of on-the-ground restoration activity; (2) the surface area of the wetland or waterbody being restored (if different than (1)); and (3) any nearby aquatic units or sub-watersheds that are connected through surface flows or subsurface flows. In the case of marine and human-made wetlands, additional considerations may be needed.

Indicators for measuring wetland degradation and restoration

17. The headline indicator for KM-GBF Target 2 is "area under restoration" from which countries use various and nationally relevant definitions to define the areas under restoration in their contexts. One important consideration for identifying and quantifying restoration efforts for wetlands identified by the Convention on Wetlands, is that the classification system includes both marine and inland environments. In freshwater (inland waters) restoration efforts, the indicators or goals most often include the flow of water (quantity and timing) and sediment, nutrients, chemicals across watersheds. For example, lake managers often use nutrient loading as an indicator for water quality and river managers may use inundation timing and quantity to monitor flow across landscapes. In contrast, the health of corals may be tracked in a more discrete quantification or using proxy measures (e.g., shark abundance). While watershed considerations are less relevant for far offshore reefs, land-based sources of pollution, often delivered through rivers, is a significant determinant for near-shore and continental shelf reefs. Notably, however, few restoration projects

that focus on the watershed level articulate and quantify the expected coral reef outcomes and even fewer measure them. This report leverages the desired outcomes as useful components for conceptualizing progress towards restoration (Table 3). In addition, the Restoration Project Information Sharing Framework provides a resource for coordinated monitoring and reporting on ecosystem restoration, including 17 headline indicators linked to the UN Decade (Gann et al., 2019).

Table 3: KM-GBF Target 2 desired outcomes (2022) and associated headline indicators (Gann et al., 2019) and associated potential indicators and data sources (Steel et al., 2025).

Primary Target 2 desired outcomes + *Headline indicators*	**Attribute / potential indicator**	**Source dataset(s)**
Enhanced ecological integrity *Ecosystem integrity*	● Protected areas ● Vegetated riparian areas ● Riverbank erosion ● Wetland gain / loss ● Lake depth, volume ● Sedimentation rate or change ● Sentinel/indicator species	● Protected Areas of the World ● Copernicus Global Land Service ● Riverbank Erosion and Accretion ● Global wetland loss reconstruction ● HydroLAKES
Enhanced connectivity	● Naturally flowing rivers ● Ground and surface water connectivity	● Mapping the world's free-flowing rivers
Enhanced ecosystem functions and services	● Forest cover change ● Lake water quality ● Water stress and variability ● Water use ● River sediment ● River discharge ● Phenological shifts in lakes ● Future streamflow and water temperature ● Nutrient inputs, loads	● Global Forest Change 2000-2021 ● Lake Water Quality 2019-present ● Aqueduct Water Risk Atlas 4.0 ● Global monthly sectoral water use ● Global River Sediments ● HydroRIVERS ● Global annual lake ice phenological dataset 1861-2099 ● FutureStreams ● EarthSTAT Nutrient Application
Enhanced biodiversity *Biodiversity target status*	● Watershed invasive species ● Climate impacts on fish ● Native species distribution and abundance	● Number of Harmful Invasive Species by Freshwater Ecoregion ● Fish species impacted by flow and water temperature extremes

WETLAND EXTENT AND DEGRADATION

Summary and Key Messages

It is estimated that at least 35% of wetlands have been lost since 1970 and wetland loss and degradation continue at an alarming rate, driven by land-use change, pollution, water abstraction, climate change and infrastructure development. These changes reduce the ability of wetlands to provide critical services such as flood regulation, carbon storage and habitat connectivity, and jeopardise their role in supporting climate and biodiversity objectives. Existing estimates suggest similarly substantial loss and degradation in many wetland types. For example, 20-50% of salt marshes, 20-35% of mangroves, 30% of seagrasses and up to 50% of coral reefs have been lost. According to global restoration frameworks such as FERM and the Restoration Barometer, up to 50% of wetland habitat types globally are now considered severely degraded. Peatland degradation is also widespread, with more than 50% degraded in parts of Europe and Africa. Achieving KM-GBF Target 2 will require the effective restoration of at least 30% of degraded inland, coastal and marine wetlands by 2030. Based on available global estimates of wetland loss, this could correspond to 900,000 to 1.1 million km² of degraded wetlands that require restoration. Achieving this target depends not only on ambition, but also on improved tracking, coordination and sustained action.

18. A synthesis of wetland extent and degraded wetlands is both useful and necessary before assessing wetland area under restoration and global wetland restoration commitments. As restoration implies a change in condition (e.g., from degraded to less degraded), establishing a baseline of current or historical wetland extent helps to track wetlands that have been lost or degraded, from which an understanding of progress from degraded to restored wetlands can be built. Understanding the area and extent of degraded wetlands, combined with an understanding of the ecosystem services they provide (e.g., fish for food), can also help to identify priority areas where substantial investment may be most beneficial. This section uses existing information to provide a synthesis of degraded wetlands, in line with the findings of the Global Wetlands Outlook (Convention on Wetlands, *in press*).

Wetland extent

19. The IUCN Global Ecosystem Typology distinguishes five major realms, across which the Convention on Wetlands classification system identifies 40 specific wetland types categorized into 3 primary wetland types (marine/coastal wetlands, inland wetlands, human-made wetlands). Most major land cover and land use datasets with global coverage distinguish major land classifications (e.g., Global Land Analysis and Discovery; Hansen et al., 2022) but do not further divide classes into the level of specificity used by the Convention (e.g., subterranean, caves, man-made wetlands). Several classes, such as kelp forests (Mora-Soto et al., 2020), coral reefs (Lyons et al., 2024), and tidal marshes (Worthington et al., 2024), have been classified as such through specific algorithms and classification typologies. Well-known land cover and land use classifications, such as Copernicus Land Monitoring Service, are useful for identifying changes (e.g., 2015 to 2019, 100 m resolution) in major categories (e.g., permanent water bodies, herbaceous wetlands), but more ambiguous for others (e.g., open sea, forests) which may or may not fit the criteria for wetland types considered by the Convention on Wetlands.

20. An updated framework for the Global Lakes and Wetlands Database (GLWD v2) distinguishes 7 waterbody types and 26 other wetland types into 33 non-overlapping types (Lehner et al., 2024).

Each classification incorporates hydrological, geomorphic, and biotic factors, improved spatial resolution of 15 arc-seconds (approximately 500m) and fractional coverage for finer details, incorporating diverse data sources such as satellite imagery and field data. The database also captures temporal dynamics, including seasonal flooding and ephemeral wetlands, making it a critical tool for understanding and managing inland surface water systems. The classification's key strengths include its hierarchical structure and its ability to map wetlands at global scales with better accuracy. Classes such as "lacustrine wetlands," "saltmarshes," "mangroves," and "peatlands" align with ecological and hydrological functions, supporting diverse research and conservation needs. It turns out that this comprehensive mapping facilitates targeted restoration by identifying priority areas, such as ephemeral wetlands, which are particularly vulnerable. This holistic database provides a robust foundation for policymakers and conservationists to enhance wetland resilience and ensure sustainable ecosystem services for future generations.

21. Another increasingly useful framework is the hierarchical, hydro-ecological classification system developed by Junk (2024; e.g., coastal wetlands, inland wetlands, artificial wetlands). This classification offers a conceptual framework that begins with hydrological parameters as the core organizing principle, supported by ecological variables at finer scales. The classification includes the introduction of "wetscapes" (large, complex wetland systems) and "functional units" (specific landscape units within wetscapes). Hydrological parameters combined with ecological and socio-economical aspects are referred to as “wetscapes” and defined as “*large landscape units in which different wetland types closely interact with terrestrial and/or deep-water ecosystems, providing the environmental conditions required by specific plant and animal populations”.*

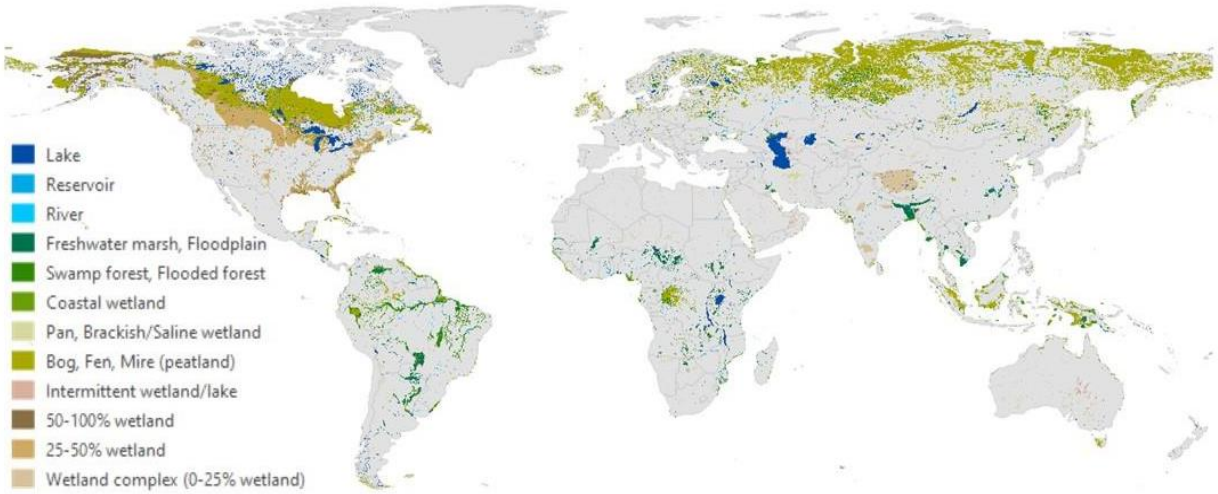


Figure 1: Global wetland extent showing all wetland classifications around the world (Source: Lehner & Doll (2004) *and Global Peatlands Initiative).*

22. In total, the estimated area of global wetlands ranges from 14.13 million km² (Convention on Wetlands, *in press*) to 18.2 km² (13.4% of global land area; Lehner et al., 2024) to 29.83 million km² (Hu et al., 2017) (Figure 1). Asia has the largest total wetland area (9.72 million km²; 31.8%), followed by South America and North America (7.95 and 5.65 million km²; 27 and 16%, respectively). Together these three continents comprise 78% of all global wetland areas (Davidson et al., 2018; Hu et al., 2017). Importantly, estimates vary widely and are highly dependent on estimation and validation methods and input data sources (e.g., substantially smaller total estimate

of wetlands: 6.38 million km², including 6.03 million km² of inland wetlands and 0.35 million km² of coastal tidal wetlands; Zhang et al., 2022).

Mangrove extent

23. Globally, the estimated area of global mangrove habitat is approximately 147,358.99 km² (2020), covering 15% of the total coastline (Leal & Spalding, 2024; Figure 2). Recent efforts to advance the identification of mangroves successfully mapped over 826,000 units of mangroves worldwide (Leal & Spalding, 2024). Indonesia is the country with the highest percent of the world's mangrove forests (20%; over 22,000 km² of mangroves), followed by Mexico (7.7%), Australia (7.1%), Brazil (6.9%), and Nigeria (6.8%). Malaysia, Myanmar, Bangladesh, Papua New Guinea, India, Mozambique, and Madagascar each contain 2-4% mangroves and all other nations have less than 2% of the total mangrove area on earth.

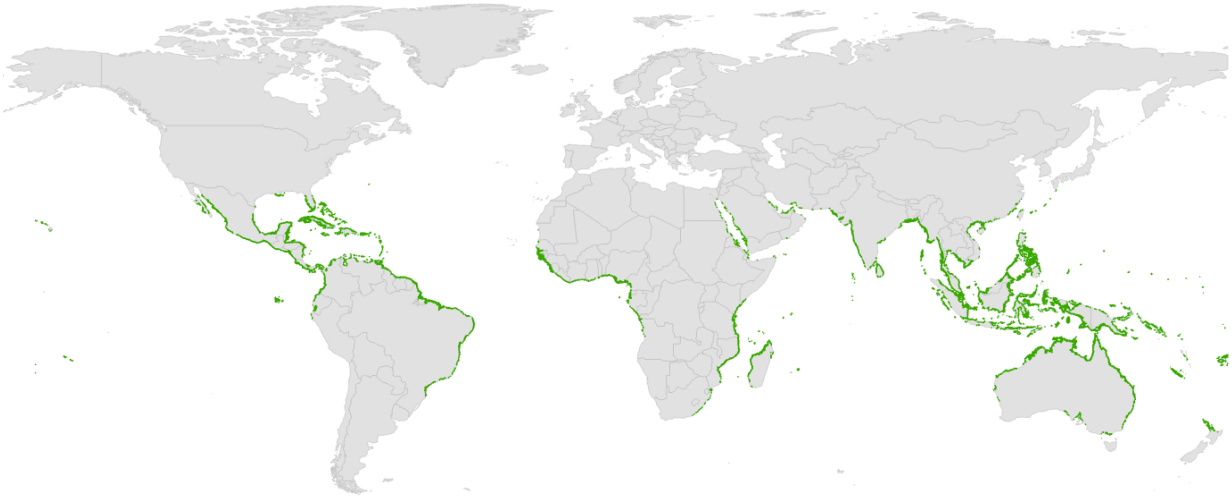


Figure 2: Global mangrove extent in 2020 (Leal & Spalding, 2024).

Coral reef extent

24. Coral reefs are critically important ecosystems, yet they occupy only a small fraction of the Earth's surface. Previous estimates suggested coral reefs covered an area between 260,000 and 600,000 km², accounting for less than 0.1% of Earth's total surface and less than 0.2% of the ocean's surface (UNEP-WCMC et al., 2021; Figure 3). However, recent updated estimates by Lyons et al. (2024) suggest a total area of approximately 348,361 km² of shallow coral reefs and an additional 80,213 km² of coral habitat. Indonesia contains the largest share of the world's coral reefs (18.3%), followed closely by the Philippines (13.6%), making their coral ecosystems as significant by area as their mangrove forests. Other notable countries, each accounting for 2–5% of global coral reef area, include Papua New Guinea, Saudi Arabia, Egypt, Australia, Solomon Islands, Mozambique, Tanzania, Fiji, and New Caledonia (UNEP-WCMC et al., 2021). Globally, more than 17,000 individual coral reefs have been mapped, providing critical data to monitor and assess their condition and distribution.

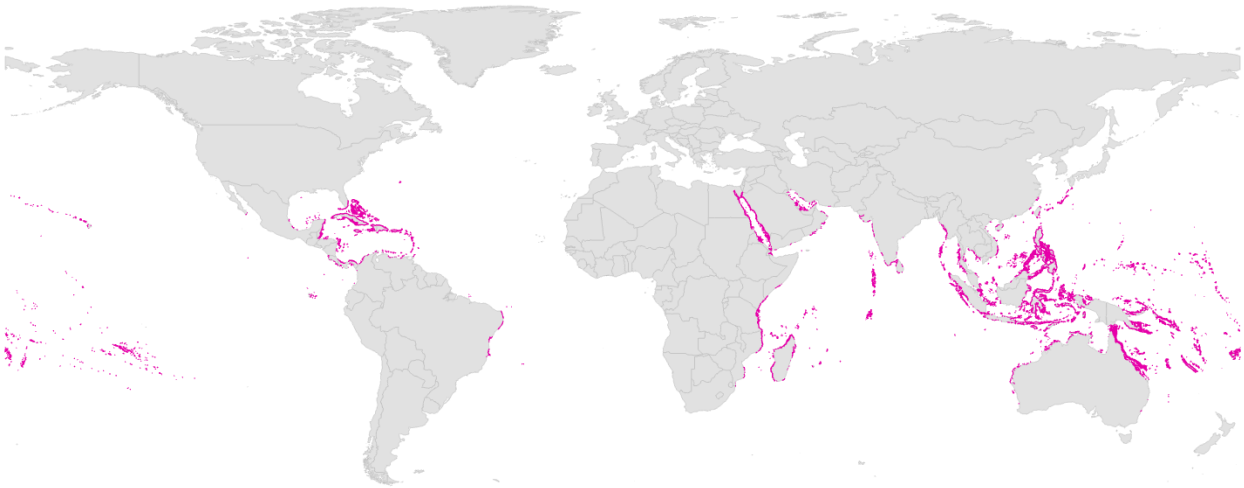


Figure 3: Global distribution of coral reefs (UNEP-WCMC et al., 2021).

Peatland extent

25. Peatlands are estimated to cover about 500 million hectares (ha) globally, about 3-4% of all land surface, though they store up to one-third of the world's soil carbon (Global Peatlands Assessment (GPA); UNEP, 2022; Figure 4). In terms of area of peatlands, Russia and Canada hold the vast majority of peatlands (61% and 20% respectively), followed by the United States (4.5%), Indonesia (2.4%), Brazil (1.1%), and Finland (1.1%). All other countries have less than 1% of the total area of peatlands as classified by the GPA.

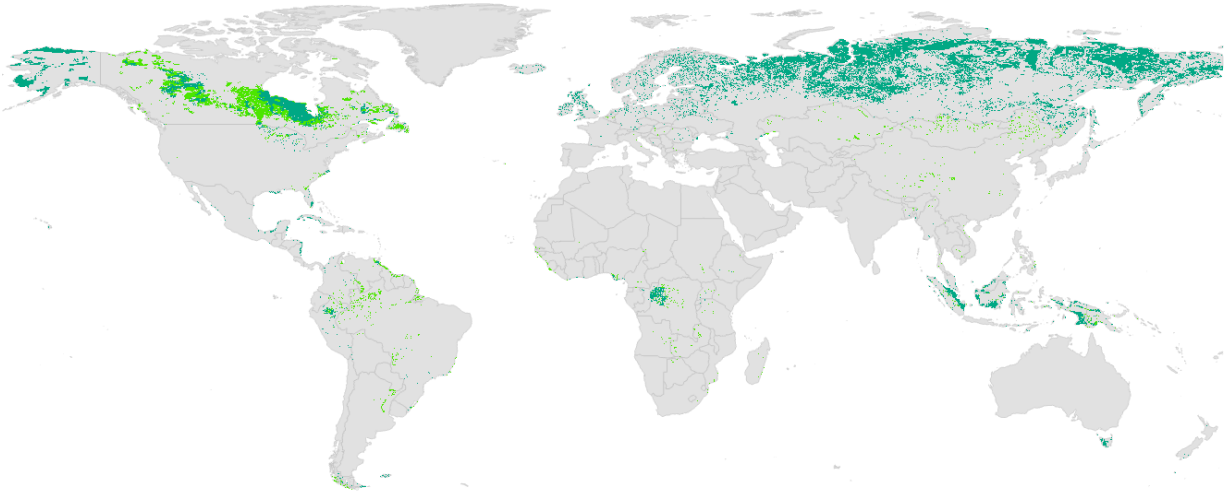


Figure 4: Global distribution of peatlands (UNEP, 2022).

26. The following table (Table 4) presents a compilation of global wetland extent and associated metrics categorized by wetland type. It includes data from various projects and sources, detailing estimated wetland coverage, classification by type, and key data gaps or considerations. This synthesis provides a comparative perspective on global wetland distribution, highlighting discrepancies in measurement methodologies, gaps in spatial coverage, and challenges in data consistency across different regions and wetland classifications.

Table 4: Compilation of global wetland extent by wetland type.

Project / Title (data source)	**Estimated extent** (km or km²)	**Wetland type**	**Data gaps and considerations**
Global Lakes and Wetlands Database (GLWD v2; Lehner et al., 2024)	18.2 million km² of wetlands globally (13.4% of the global land area excluding Antarctica)	33 types classified into 4 realms	Improved methodologies on global estimates; still inconsistencies with definitions and national inventories
	278,700 km²	Estuarine waters	
	4,616,500 mid-point estimation between 2,053,000 – 7,180,000 km²	Inland marshes and swamps	
	589,300 km²	Rivers and streams	
	2,715,300 km²	Lakes	
Global Standard for Wetlands Conservation (Ramsar Sites Information Service, 2025)	2.58 million km² of designated Wetlands of International Importance globally (this is ~14% of the total listed by Lehner et al., 2024)	Convention on Wetlands typologies	Provides national level information related to Convention on Wetlands criteria, management plans, and threats
Global distribution of tidal marshes (Worthington et al., 2024)	Total area of tidal marshes estimated to cover 52,880 km² across 120 countries and territories	Tidal marshes (saline, brackish, and freshwater tidal marshes)	High uncertainty of past estimates ranged from 22,000 to 400,000 km²; no previously consistent maps
The global distribution and trajectory of tidal flats (Murray et al., 2019)	127,921 km²	Tidal flats	Delineating heterogenous habitat remains challenging despite advances in satellite-imagery resolution and algorithms
Amazonian Peatland Extent (Hastie et al., 2024)	Total peatland extent in the Amazon estimated at 251,015 km² (larger than Congo; 30% smaller than recent estimates)	Amazonian Peatlands (flooded forests)	Lack of ground validation data and mapping for specific areas; new field surveys are needed for high accuracy mapping
Global wetland dataset at 30m resolution (Zhang et al., 2024)	Measures global wetland in 8 sub-categories of wetland types with ~87% accuracy (2000-2022)	Permanent water, swamps, marshes, tidal flats, saline, mangroves, salt marshes	Limited inland wetland mapping compared to coastal wetlands; needs high-confidence training samples for accurate classification
Global Coral Reef Monitoring (GCRMN)	Total global area of coral reef coverage estimated to be 259,647 km² (2025) in > 100 countries; only 0.2% of seafloor area but support 25% of marine species	Coral reefs	At 1.5°C warming, 70-90% of reefs may be lost; at 2°C, almost all reefs will be gone. Climate change and bleaching events are increasing rapidly.
Allen Coral Atlas (Lyons et al., 2024)	348,357 km² (shallow reefs); 80,214 (habitats)		

Global map of kelp forests and intertidal green algae (Mora-Soto et al., 2020)	17,088 km²	Kelp forests	Satellite-based information
UNEP-WCMC et al., 2021; Blume et al., 2023	358,814 km²	Seagrass	Compilation of existing spatial databases + satellite imagery, including newly discovered Bahamas extent
Global Mangrove Watch (Leal & Spalding, 2024; Bunting et al., 2022)	151,120 km²; nearly 14.9% of the 2,139,308.93 km of all coastlines (linearly)	Mangroves	Limited availability of ground-truthed data; challenging to draw causal links to drivers of change
The Sustainable Wetlands Adaptation and Mitigation Program (Gumbricht et al., 2017)	Tropical and subtropical wetlands distribution estimated to be 4.7 million km² (5.3 million km² including open water)	Open water, mangrove, swamps, fens, riverine, lacustrine, floodplains, marshes	Lack of data (ground) validation in tropical regions; problems estimating wetland areas due to soil moisture index

Defining wetland degradation

27. Defining wetland degradation can be highly variable and context dependent. Wetland degradation can be conceptualized as any process, action, or disturbance (human or natural) that limits, reduces, or hinders the condition, function, structure, or ecosystem services of a wetland. It involves deterioration of a wetland's ability to provide essential ecological services such as water filtration, habitat for wildlife species, carbon sequestration, and flood regulation. Degradation can occur from direct actions to wetland area or more broadly within the watershed, which can cause, for example, hydrologic alterations or biological invasions. Examples of wetland degradation include wetland drainage or physical reduction in size, water pollution, species loss or declines, change in timing or duration of natural hydrological cycles, and sedimentation. In the context of this report, wetland degradation refers to an impaired state or loss of a wetland that necessitates or induces the need for wetland restoration measures to improve its function, structure or services.

Wetland loss and degradation estimates

28. With 35% of global wetland area lost since 1970, wetlands are disappearing three times faster than forests, making them the most threatened ecosystem globally (Convention on Wetlands, 2021). Other estimates near 3.4 million km² of inland wetlands have been lost since 1700 with a net loss of 21% of global wetland area (Fluet-Chouinard et al., 2023). It is estimated that 50% of warm-water coral reefs (1870-2019), 20-50% of saltmarsh areas (1850-2019), 20-35% of all mangrove cover (1980-2010), and 30% of all seagrass areas (1970-2000) have been lost (UNEP-WCMC et al., 2021) (Table 5). In the case of coastal wetlands, it is estimated that approximately 50% of areas have been lost, and up to 90% of remaining coastal wetlands are projected to be lost by 2100 (Crooks et al., 2011). From 2009 to 2018, coral cover declined by 14%, which was a substantial loss for coral reefs, followed by several subsequent bleaching events. While the above estimates are the most recent reported, this report acknowledges the variability in frequency of updated statistics and therefore the potential uncertainty in corroborating studies from mixed time periods.

29. Recent attention to the value of mangroves has led to advancements in understanding mangrove degradation. It is estimated that between 1996 and 2000, the total extent of mangroves decreased by 5,245.24 km² and that nearly 20% of mangrove species are now threatened with extinction (IUCN Red List, 2025; Table 5). The five countries with the most substantial loss in this time frame were Indonesia (-1,739.04 km²), Australia (- 483.91 km²), Mexico (-447.88 km²), Myanmar (-385.81 km²), and Cuba (-291.88 km²) (Leal & Spalding, 2024). In contrast, global peatland degradation is estimated at approximately 12% loss (e.g., degraded to the extent that peat is no longer formed). This number ranges, however, from 50% degraded peatlands in Europe, to 13% degraded in Asia and 2% degraded in North America. In Africa, twelve countries reported that more than 50% of their peatlands are already degraded.

30. In the case of the world's major rivers, it is estimated that nearly two-thirds of large river systems are impeded (e.g., not considered to be 'free-flowing') by dams, drainage channels, or other flood protection structures (Grill et al., 2019). In addition, as much as three-quarters of the flow of the world's major rivers is artificially interrupted before it reaches the ocean. These are alarmingly high rates of human impact on riverine and lotic systems, largely because of water demands for energy, human consumption, recreation, and agricultural needs.

Table 5: Degraded or lost wetland estimates. Note that degraded or lost wetlands are not necessarily under restoration but help provide baseline information from which restoration efforts can build.

Wetland type	Estimated metric	Project / Title (Data source)
Inland and coastal wetlands	64-71% of global wetlands have been lost since 1900.	Trends in global wetland area (Davidson et al., 2014)
Global	Of 2,870 million ha of converted land (1992–2015), ~2% is wetlands.	Global priority areas for ecosystem restoration (Strassburg et al., 2020)
Mangroves	From 1996 - 2020, mangrove extent decreased by 5,245.24 km². Of the 64 species of mangroves globally, 12 are considered threatened.	Global Mangrove Outlook
Inland wetlands	3.4 million km² of inland wetlands have been lost since 1700 (primarily conversion to croplands); net loss of 21% of global wetland area.	Global wetland loss from 1700-2020 (Fluet-Chouinard et al., 2023)
Coral reefs	From 2009 to 2018, coral cover declined by 14%, due to recurring large-scale coral bleaching events and inadequate recovery time between events.	Global Coral Reef Monitoring Network (GCRMN)
Seagrasses	Since 1879, 29% of the known seagrass extent has been lost. Seagrasses have been declining at a rate of 110 km²/yr since 1980. At least 22 of the world's 72 seagrass species are in decline.	Ocean+ 2025 (IPBES, 2019; Waycott et al., 2009)
Mangroves	From 1996 to 2016, global mangrove extent decreased by more than 6,000 km². From 1980 - 2010, 20-35% of mangrove cover was lost.	Ocean+ 2025 (Spalding et al., 2010)
Coral reefs	From 1870 to 2019, 50% of warm-water coral cover was lost; over 50% of all coral reefs have been substantially degraded; reefs are expected to decline by 70-90% with 1.5°C warming.	Ocean+ 2025 (IPBES, 2019)

Coastal wetlands	In the last 100 years, 50% of coastal wetlands have been lost and up to 90% of remaining wetlands are projected to be lost by 2100.	Ocean+ 2025 (Crooks et al., 2011)
Saltmarshes	20 - 50% loss in saltmarsh cover between 1850 and 2019	
Rivers (global)	37% of rivers longer than 1,000 km remain free flowing over their entire length and 23% flow is uninterrupted to the ocean	Free flowing rivers (Grill et al., 2019)

Protected areas

31. In understanding wetland degradation, it is both useful and necessary to examine the world's protected areas as a potential mechanism for slowing degradation and improving the status and integrity of wetland ecosystems globally. Theoretically, sites designated as protected areas by the World Commission on Protected Areas (WCPA)[1] of the IUCN should be under "effective management by 2012 using participatory and science-based site planning processes and effective participation of stakeholders"; yet the degree of protections varies widely, challenged by illegal harvest of species, limited enforcement or monitoring capacities, and cross-sectoral compliance.

32. Currently, there are 39 wetland World Heritage Sites, 96 river Biosphere Reserves, and 2,532 listed Wetlands of International Importance covering 257,909,286 ha. However, not all inland water types are well-represented. Only 10% of large rivers (Abell et al., 2017) and just 11% of seasonal wetlands are protected globally (Reis et al., 2017). As of February 2025, the World Database on Protected Areas (WDPA) contained a total of 305,196 records (303,313 protected areas), covering 244 countries and territories (UNEP-WCMC et al., 2025). There was a total of 6,484 records for Other Effective Area-based Conservation Measures (OECMs), covering 15 countries and territories (UNEP-WCMC et al., 2025). It is estimated that a total of 16.4% (n=286,811 protected areas) of all terrestrial and inland waters are covered as protected areas and 8.35% (n=16,502 protected areas) of marine waters are protected (UNEP-WCMC et al., 2025).

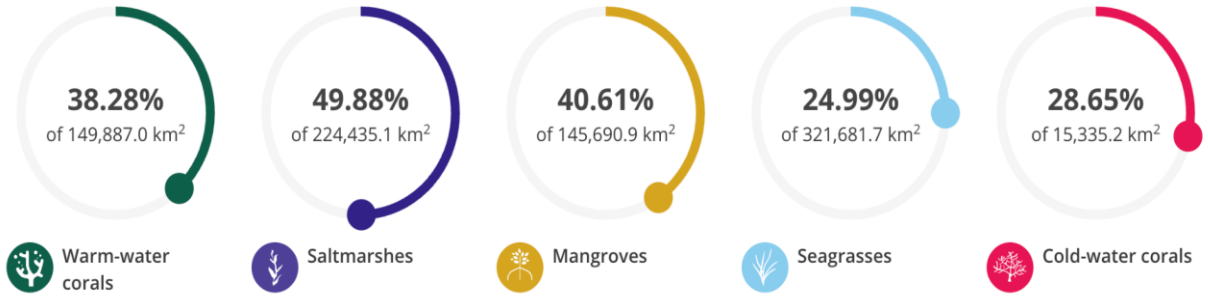


Figure 6: Proportion of habitat within protected and conserved areas (Derived from Ocean+ Habitats; UNEP-WCMC, 2025).

33. In terms of habitat types, it is estimated that approximately 45% (24,200 km²) of the world's tidal marshes are found within the world's protected areas (Worthington et al., 2024), 42% of mangroves are within protected areas (Leal & Spalding, 2022), 32% of the total area of coral reefs fall within protected boundaries (Marine Conservation Institute, 2018), and approximately 31% of

[1] See https://iucn.org/our-union/commissions/iucn-world-commission-protected-areas-2021-2025.

tidal flats are within protected areas (Worthington et al., 2024). The MPAtlas estimates that 36% of the 100 largest marine protected areas are considered to be “fully protected” or “highly protected” (Marine Conservation Institute, 2024). In addition, 6.2% of national marine areas are in “fully protected” or “highly protected” zones; two countries (Palau, United Kingdom) have protected at least 30% of their marine areas in zones classified as “implemented” and “fully protected” or “highly protected”. Of the countries with the largest coral reef area, Australia and New Caledonia boast the highest proportion of fully protected coral reef area. Indonesia, Fiji, and the Philippines have some level of protection for less than half of all coral reefs, while Papua New Guinea, Saudi Arabia, Micronesia, and French Polynesia have little to no protected coral reefs (Burke & Wood, 2021).

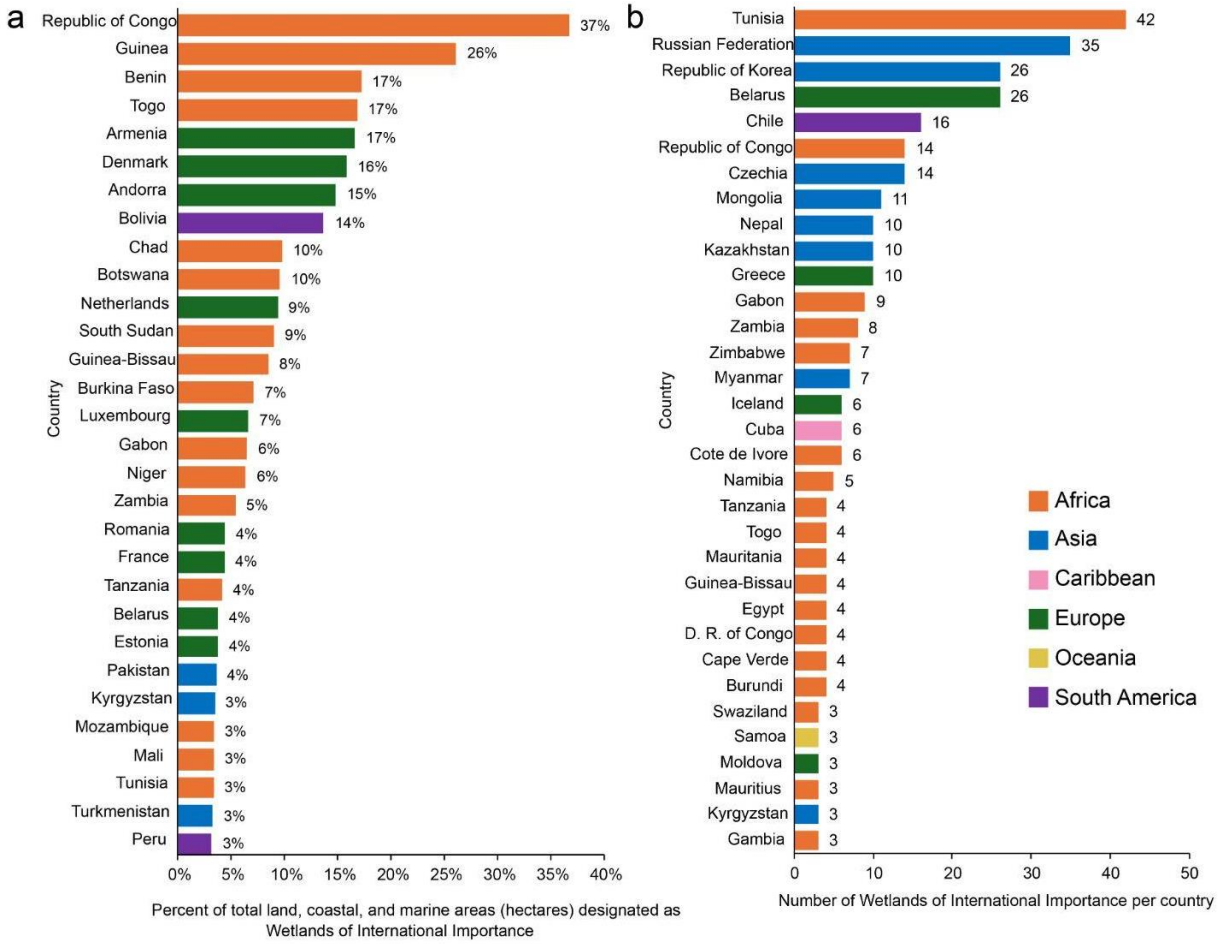


Figure 7: Percentage area (a) and number (b) of Wetlands of International Importance by country.

Wetlands of International Importance

34. Similarly, examining the presence and extent of Wetlands of International Importance can help contextualize progress towards reducing degradation and areas where restoration activities may be prioritized. In total, there are currently 2,532 Wetlands of International Importance covering 257,909,286 ha (more than 2.5 million km^2) of the world’s surface area (Ramsar Sites Information Service, 2025; Figure 7). Of the designated sites, there are approximately twice the number of inland sites (n=2,051) than marine or coastal wetlands sites (n=1029) or human-made wetlands

(n=914). Europe has the most Wetlands of International Importance (n=1,134) followed by Asia (n=445), Africa (n=428), North America (n=222), Latin America and the Caribbean (n=217), and Oceania (n=86). Nearly twice the number of sites have management plans (n=1,309) compared to those that do not (n=770) (Figure 7).

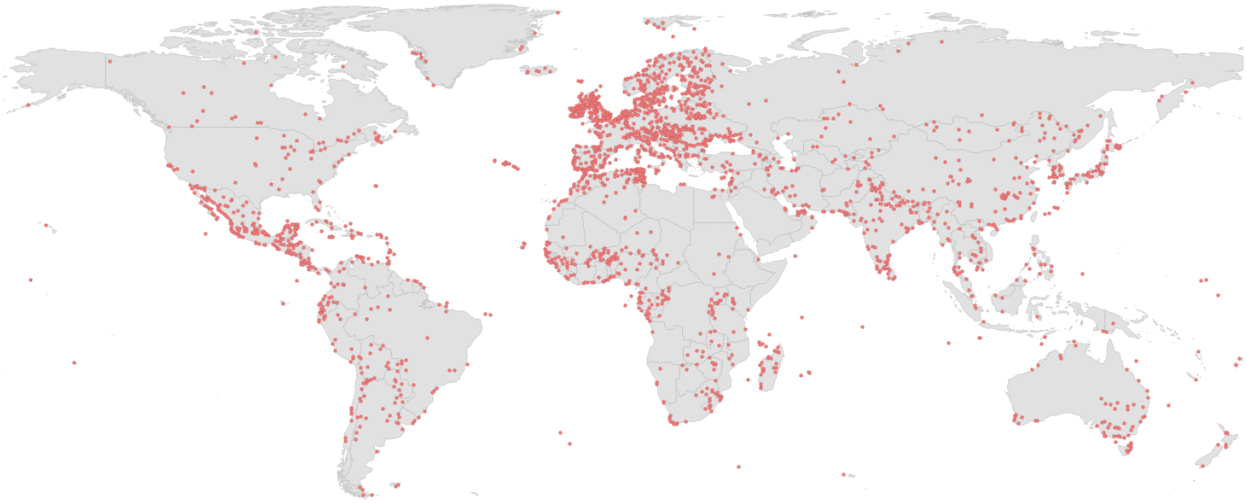


Figure 8: Global distribution of 2,532 Wetlands of International Importance (pink circles) covering 257,909,286 ha of earth's surface (Ramsar Sites Information Service, 2025).

35. Wetlands of International Importance with associated threat data show the greatest threats come from pollution, resource use, system modifications, and agriculture or aquaculture (Figure 8). Most Wetlands of International Importance are under multiple threats. Importantly, 67 sites are designated as transboundary, while the remaining sites (n=2,465) are designated within a single country. This finding has implications for the need for transboundary basin management and using catchment areas instead of administrative delineations to understand and track wetland dynamics.

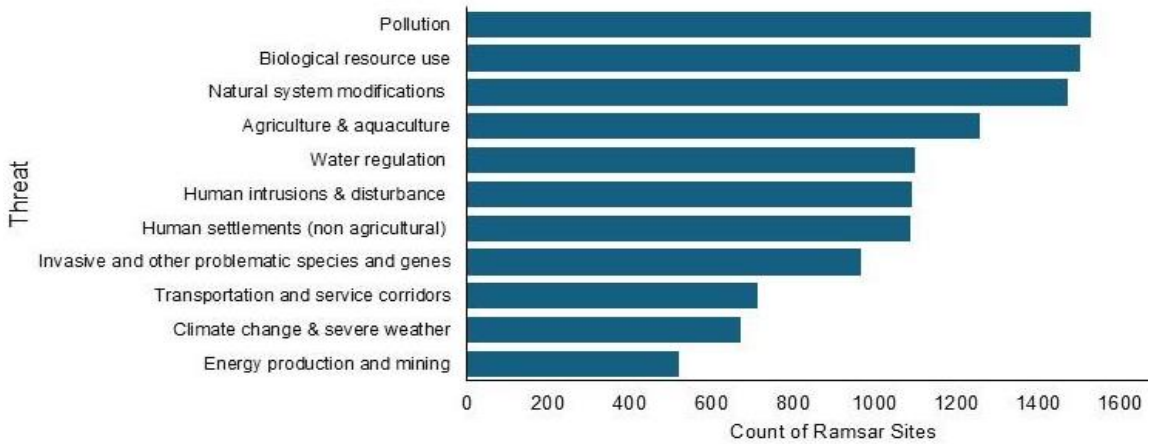


Figure 9: Count of threats to Wetlands of International Importance (x-axis), as classified in the Ramsar Sites Information Service, from the greatest threats to the least threats (Ramsar Sites Information Service, 2025).

WETLAND RESTORATION COMMITMENTS

Summary and Key Messages

Having established an understanding of the global extent of wetlands and degraded wetlands, national, regional and local commitments are necessary to promote progress towards restoration. This section distinguishes between commitments and actual wetland restoration work, recognising that commitments and pledges do not always translate into real action. Global restoration ambitions include the restoration of more than 400,000 ha of mangroves, 300,000 km of rivers, 350 million ha of wetlands, and 450 million ha of degraded terrestrial landscapes. At COP15, approximately 66% of Contracting Parties reported having established or partially established national targets for wetland restoration, while 74.2% had identified or partially identified priority sites for wetland restoration. This reflects an increasing strategic focus on wetland restoration, building on spatial planning and national target setting. Several countries also reported specific area-based targets, but the total area committed to restoration under the Convention remains a long way off from the GBF target. Globally, large-scale initiatives signal growing momentum. In the Framework for Ecosystem Restoration Monitoring (FERM), 20 countries have committed a total of more than 44 million ha of wetlands for restoration, while the IUCN Restoration Barometer indicates ecosystem-wide pledges of over 50 million ha across 18 countries (of which wetlands are a minor proportion). Importantly, however, 36 countries and territories remain absent in restoration commitments of any kind, emphasizing the need for global engagement to achieve ambitions and targets. Overall, restoration commitments and pledges are ambitious, but do not signal assurance of achievement, therefore emphasizing the need for equally ambitious restoration activities.

36. The first step to assessing wetland restoration commitments is to understand where there is theoretical attention or prioritization and then examine whether these commitments have been translated into progress in terms of area restored. National commitments indicated in the Convention on Wetlands 4th Strategic Plan (2016-2024) urged Contracting Parties and Convention partners to "commit and identify wetland restoration" (Goal 2) and "maintain or restore ecological character" (Target 5). Despite the ambiguity (i.e., Target 5 without numerical targets), the number of countries reporting national targets increased marginally from COP 11 to 15. Globally, commitments for restoration boast impressive statistics and ambitious goals for the next 5 to 10 years, with most commitments targeting completion by the year 2030 (Table 6).

Table 6: Global wetland restoration initiatives by scale (UNEP, 2021).

Name	Description / Target	Scale
Freshwater Challenge	Restore 350 million ha (~3.5 million km²) of wetlands and 300,000 km of degraded rivers by 2030.	Global
KM-GBF	Restore at least 30% of degraded terrestrial, inland water, and coastal marine ecosystems by 2030.	Global
United Nations Decade on Ecosystem Restoration 2021-2030	Prevent, halt and reverse ecosystem degradation and recover biodiversity, and ecosystem integrity; enhance human health and well-being, including sustainable delivery of ecosystem goods and services; and mitigate climate change.	Global
Wetlands International	Restore 70% of organic land including drained peatlands by 2050.	Global

Global Restoration Commitments and Pledges	Wetlands, peatlands, and mangrove restoration account for 10.4% of the global restoration commitments.	Global
Kelp Forest Challenge	Restore 4 million ha (~40,000 km²) by 2040.	Global / kelp forests
4 per 1000 Initiative	Achieve annual growth of 4% in soil carbon stocks by improving organic matter and promoting carbon sequestration in soils.	Global
The Mangrove Breakthrough (Global Mangrove Alliance)	Safeguard 15 million ha of mangroves by 2030 by halting mangrove loss (16,800 ha), restoring half of recent losses (409,200 ha), and doubling protection of mangroves globally (6.1 million ha)	Global / mangroves
Global Peatlands Initiative	Conserve, restore, and sustainably develop peatlands.	Global / peatlands
International Coral Reef Initiative	Preserve coral reefs and related ecosystems around the world through informal partnerships.	Global / reefs
Bonn Challenge	Restore 350 million ha (~3.5 million km²) of forest and landscapes by 2030.	Global / Forests and landscapes
Great Green Wall Initiative	Restore 100 million ha (~1 million km²) of currently degraded land by 2030.	Africa / Landscapes
Regreening Africa	Restore ecosystems in 8 countries and improve the resilience of 500,000 households.	8 countries in sub-Saharan Africa
World Restoration Flagships	Restore 10,000 ha (~100 km²) of mangroves by 2030 in Sri Lanka.	Sri Lanka mangroves
Lamu Blue Carbon Project	Conserve and restore 4,000 ha (~40 million km²) of mangrove forests along Kenya's coast.	Kenya mangroves

37. Other key platforms, like FERM and the Restoration Barometer, synthesize restoration commitments reported at the national level (n=33 different countries between the two platforms). In FERM, 20 countries have committed nearly 44.3 million ha of wetlands (*'freshwater' or 'peatlands'*) to restoration. The most ambitious commitments are in Pakistan (25 million ha), China (10 million ha), and Kazakhstan (8 million ha), which represent 97% of total committed area (Table 7). Although substantially small land masses, Comoros, Saint Lucia, and Vanuatu (113,000 ha), Sri Lanka (5,000 ha), and Sao Tome and Principe (4,000 ha) have proportionally large goals.

38. Countries (n = 18) reporting pledges for the Restoration Barometer effort include all restoration areas, rather than only focusing on a single wetland or project area. Because of this, the numbers appear substantially larger than those reported in FERM. However, such information acknowledges the country's active role in making commitments for restoration. More than 70% of commitments are pledged by Cameroon, Mexico, Kenya, Costa Rica and Madagascar. Countries reporting commitments in both platforms (FERM and Restoration Barometer) are Bangladesh, Colombia, Kazakhstan, Kenya, and Sri Lanka (Table 7).

Table 7: Restoration commitments reported by countries in FERM and the Restoration Barometer.

Country	FERM area committed to restoration (ha)	Restoration Barometer area pledged for restoration (ha)
Pakistan	25,000,000	
China	10,000,000	
Kazakhstan	8,000,000	1,500,000
Argentina	500,000	
Nepal	366,000	
Mauritania	262,000	
Comoros, St. Lucia, Vanuatu	113,000	
Morocco	60,000	
Philippines	10,000	
Sri Lanka	10,000	200,000
United Arab Emirates	5,000	
Sao Tome and Principe	4,000	
Afghanistan	3,000	
Indonesia	250	
United States	195	
Brazil	153	
Bangladesh	150	750,000
Kenya	100	5,100,000
Colombia	30	1,000,000
Egypt	24	
Cameroon		12,062,768
Mexico		8,468,280
Costa Rica		5,000,000
Madagascar		4,500,000
Peru		3,200,000
Rwanda		2,000,000
Ghana		2,000,000
Guatemala		1,200,000
Mozambique		1,005,000
El Salvador		1,000,000
Uganda		650,295
Kyrgyzstan		323,000
Tajikistan		66,000
Total	**44,333,902**	**50,025,343**

39. Importantly, commitments, intents, or promises made by an organization, government, or institute are only the first step towards restoration. Often, restoration commitments represent a formal or planned effort to restore wetlands. However, sufficient financial, practical, logistical, and organizational capacities are necessary to shift from a commitment to implementation of restoration activities. Ensuring ultimate success in wetland restoration involves securing the funds, community engagement, and institutional support not only for a discrete set of activities but also for long-term monitoring, as the impacts of restoration can take years or even decades to become evident. Although not mentioned in the above examples and seldom seen as a type of commitment, the idea of “no net loss” (e.g., mitigation banking to make up for wetland destruction) or “no additional loss” may be a useful and pragmatic commitment in some contexts where protection may be more useful or advantageous than major restoration efforts and interventions.

40. Although global commitments and pledges are encouraging, a critical and persistent challenge remains: the gap between ambition and tangible restoration outcomes. This implementation gap is evident in the small number of projects that progress beyond the planning stage, and in the slow adoption of robust monitoring systems. The success of restoration efforts depends not only on the volume of commitments, but also on sustained political will, adequate financing and the long-term capacity to implement and track progress effectively. Unless these barriers are addressed directly, the restoration goals set out in the KM-GBF and the SDGs risk remaining merely aspirational.

WETLAND RESTORATION EFFORTS

Summary and Key Messages

Global efforts toward wetland restoration are gaining momentum, supported by a robust policy foundation and increasing alignment across global initiatives and national targets. However, a persistent gap remains between commitment and implementation and bridging the gap between ambition and action continues to be a challenge. For example, at COP14, only 8% of Contracting Parties reported that wetland restoration activities had progressed to the implementation stage (Target 12.3). By COP15, this figure rose to 53.6% of Parties reporting that restoration or rehabilitation programmes had been implemented since COP14. This increase is likely to reflect a combination of on-the-ground progress and improvements in national reporting. Complementary data from the Restoration Barometer show that of the 50 million ha pledged, only 14.2 million ha (28%) were reported as under active restoration as of 2022. In the case of FERM, although the scale of commitments is high, quantified and verified data for wetland-specific progress remain limited. Monitoring and reporting of wetland restoration is challenged by most indicators focusing on area alone, which yields limited understanding of long-term outcomes, biodiversity gains, or social impacts. As a result, it remains difficult to assess the extent to which reported restoration efforts contribute to ecological recovery or achievement of KM-GBF Target 2.

41. After reviewing wetland extent and degradation and restoration commitments at different scales, this section synthesises regional, national and local wetland restoration efforts that are working to bring wetlands under effective restoration. While many global commitments are made on a global scale, it is most effective to summarise progress towards wetland restoration at regional and smaller scales, as these are the scales at which most activities are implemented.

Indicators of restoration and evaluating success

42. Key restoration indicators such as land cover, biodiversity, carbon stocks and degraded areas are among the most commonly used in technical analyses, but the range of indicators is broad and highly context dependent. For this effort, restoration efforts and outcomes are reported using the guidelines developed by the FAO Freshwater Restoration Working Group (Steel et al., 2025). The GBF Target 2 desired outcome categories (e.g., improved ecological integrity, improved connectivity, improved biodiversity, and improved ecosystem functions and services) and associated ecological attributes (habitat complexity, connectivity, water quality, biotic composition, hydrological regime) are used (Table 5; Moreno-Mateos et al., 2012).

43. When evaluating areas under restoration or areas restored, it is valuable to assess which efforts are successful. However, definitions of 'success' can range from taking the first steps towards overarching goals to a fully thriving wetland decades after restoration activities have been completed. The main objective of this report is to assess areas under restoration and progress towards restoration, but it is beyond the scope of this report to assess the success of individual projects.

Sources of data for restoration synthesis

44. For the purposes of synthesising existing data on restoration efforts globally, spatial data products are most useful and practical. Additional data sources include national reports on the implementation of the Convention on Wetlands (e.g., formal reporting mechanism under the Convention on Wetlands), the UN Freshwater Explorer, and supplementary information from peer-reviewed literature (Table 3).

45. In addition, web-based tools and data products can contribute to an understanding of existing restoration commitments and efforts. For example, FERM aims to integrate existing indicators and datasets from the reporting processes of the Rio Conventions, the Bonn Challenge, and other international restoration commitments under the Convention on Wetlands. By consolidating diverse sources of information and making them more accessible, FERM supports data-driven approaches and enhances the monitoring of restoration indicators on a global scale. Additionally, its geospatial platform fosters improved data collection methods and ensures progress in restoration efforts.

Regional restoration efforts

46. To synthesise regional restoration efforts, information was compiled from the FERM database, World Restoration Flagship projects, and literature synthesis of other relevant projects. For the purposes of this report, there are too many individual projects to highlight them all; instead, results are summarised to highlight themes by region and wetland type. Themes relating to project-defined successes and overall objectives of the effort are also highlighted. Synthesis of regional efforts provides an understanding of high-level efforts that have gained traction since initial commitments were made and offers insights into which components of projects have been effective, funded, or successfully completed in different regions of the world.

47. First, World Restoration Flagship projects with a focus on wetland restoration are highlighted (n=10; Table 8). Of the 10 projects, four currently have a restoration area greater than or equal to the 2030 restoration target, indicating early success in meeting the 2030 targets under the KM-GBF. The main themes of these featured Flagship Projects include a focus on forestry, but with water as the ultimate goal; integrated, co-developed, or community-led project designs; and nature-based solutions (NbS; i.e., addressing complex socio-environmental challenges by harnessing natural processes and ecosystem functioning; e.g., agroforestry, blue carbon, green infrastructure). All flagship projects have significant resources allocated to their success, involve multiple actors (e.g., NGOs, government, community organisations), and include elements of capacity building or resilience planning, given the anticipated future challenges of climate change. Most, but not all, efforts include some components of the four established metrics for restoration (e.g., enhanced biodiversity, connectivity, ecosystem services and function, and ecological integrity).

Table 8: World Restoration Flagship projects related to freshwater and peatland restoration as of December 2024 (UNEP & FAO, 2024).

Project name	Area under restoration (ha)	Restoration goal by 2030 (ha)	Key focus
The Kilimanjaro Project: Riverside agroforestry to protect water for 5 million people	4,500	3,000	Utilising agroforestry to leverage riparian zone restoration of 20 rivers; led by NGOs
Extrema City Hall Conservator das Aguas Project	1,000	1,000	Locals planting 2 million trees in the Atlantic Forest to stabilize riverbanks and prevent erosion; led and implemented by government
Rehabilitating Ziway-Shalla Lakes for people and nature	1,212	300	Landscape approach to restoring a critical migratory flyway; led by Dutch and Ethiopian NGOs alongside small farmers
Nature Kenya: Tana Delta Restoration Initiative	5,000	50,000	Restoring functionality of the delta and training residents in sustainable agriculture practices
Living Indus Initiative	1,350,000	25,000,000	Community resilience through nature-based solutions; led by Government of Pakistan and FAO
Namami Gange	30,000	135,000	Reforesting the Ganges basin and promoting sustainable farming; led by India's government
Small-Island Developing States Ecosystem Restoration Flagship	4,000	113,000	Multinational initiative involving scaling up ridge-to-reef restoration in Vanuatu, Comoros, and Saint Lucia
Borneo Nature Foundation: Restoration of Borneo's tropical peat-swamp forests	25,000	50,000	Empowering communities to restore burnt peatlands in Sebangau National Park by planting 1 million native trees over 5 years and blocking drainage channels to rewet peatlands
Life Peat Restore Poland	1,350	689	Constructing 214 peatlands from natural and local materials, and removing trees and shrubs to facilitate natural regeneration
Restoration of peatland in Snæfellsnes peninsula	100	1,000	Filling ditches and building dams to facilitate water retention on historically drained areas for agriculture

National restoration efforts

48. The national level is currently the most commonly reported unit for understanding restoration activities. However, it is noted that, ideally, catchment level reporting will be increasingly used by countries to recognise catchments as the most hydrologically meaningful unit for reporting, rather than using administrative (country) boundaries. This section highlights some of the major efforts to collate national restoration efforts, including (a) the Restoration Barometer, (b) FERM, (c) the Mangrove Alliance Tracker, (d) the RESTOR database, and (e) national reports submitted to the Convention on Wetlands for meetings of the Convention of the Parties. Importantly, effective

restoration is based on benefits to both nature and people (KM-GBF Target 2). However, gross acreage of commitments does not specify whether the projects that make up those commitments are well-designed (e.g., afforestation of mangroves where mangroves do not belong). As such, careful attention should be paid to the specific metrics and outcomes for each effort.

a. Restoration Barometer

49. The Restoration Barometer was created by IUCN as a global restoration tracker and for countries who have committed to restore landscapes under international goals or targets (IUCN, 2022). The tool has been endorsed by 50 countries and is used by 22 countries. In total, as of 2022, 18 countries pledged to restore 50,025,343 ha, of which 14,240,519 ha are reported to be under restoration (Figure 9). However, these numbers are for all ecosystems. Within the last report, 2 countries reported progress on peatland restoration, 9 countries in coastal and mangrove habitats, and 8 in rivers, streams, lakes, and wetlands. Notably, however, the majority of reported areas treated or committed focused on reforestation, emphasizing the need for specific commitments to wetland areas.

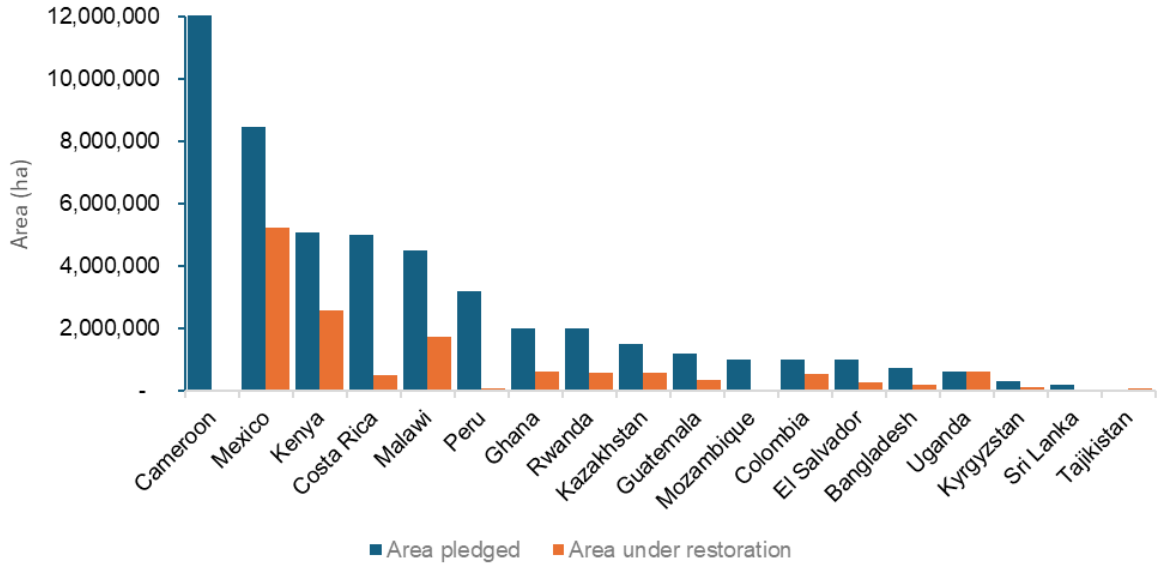


Figure 10: Area pledged (blue) and area under restoration (orange) reported to the Restoration Barometer by individual countries (n=18) (IUCN, 2022).

b. FERM

50. Of the 435 initiatives reported in FERM (as of February 2025), 148 are reported as having links to fresh waters (n=130) or peatlands (n=33; some overlapping with freshwater). The majority of the freshwater and peatland projects are originally linked to the Society of Restoration (SER) (n=119; more being added in real time) and fewer linked directly to GEF (n=9) and FERM (n= 24). A total of 28 countries have reported projects in FERM by reporting areas under restoration numerically, ranging from the largest areas in Kazakhstan (7 million ha), China (2 million ha), and Pakistan (1,060,000 ha) to the smallest areas in Vietnam (38.8 ha), Colombia (30 ha), Kenya (29 ha), Venezuela (20 ha), and Mexico (2 ha). However, it should be noted that many of the projects, particularly those from SER, did not have areas under restoration explicitly recorded in the FERM

database. Many of the SER projects appear to be highly localised, with very small areas under restoration, such as a single lagoon, pond or stretch of river. In contrast, many of the projects reported directly through GEF or FERM appeared to be larger projects with much larger areas under restoration.

c. Mangrove Alliance Tracker

51. In the State of the World's Mangroves report (Leal & Spalding, 2024), a total of 8,183 km² of mangroves are considered 'restorable'. If half of this area was able to be restored (409,200 ha; goal of 'The Mangrove Breakthrough'), it is estimated that the new habitat would generate as much as 25 billion commercially important fish and shellfish annually and support 4.1 million small-scale fisheries. Additional benefits from mangrove restoration include safeguarding carbon in soil and above-ground biomass, mitigating damages from storms, and reducing flood risk to as many as 15 million people each year (Global Mangrove Alliance, 2022). The 'Mangrove Breakthrough' project was launched in 2024 with $4 billion of financial support and a goal of safeguarding 15 million ha of mangroves by 2030. Mangrove restoration efforts have been increasing, yet it is estimated that at least 50% of mangroves are still threatened. While there have been some natural gains in mangrove extent, it is estimated that restoration efforts accounted for 25% and 33% of mangrove expansion in Southeast Asia and Africa, respectively. The Mangrove Alliance Tracker was developed to more closely monitor progress towards restoration, but current estimates are not well-established for specific gains beyond the generalizable statistics provided in summary reports and briefings.

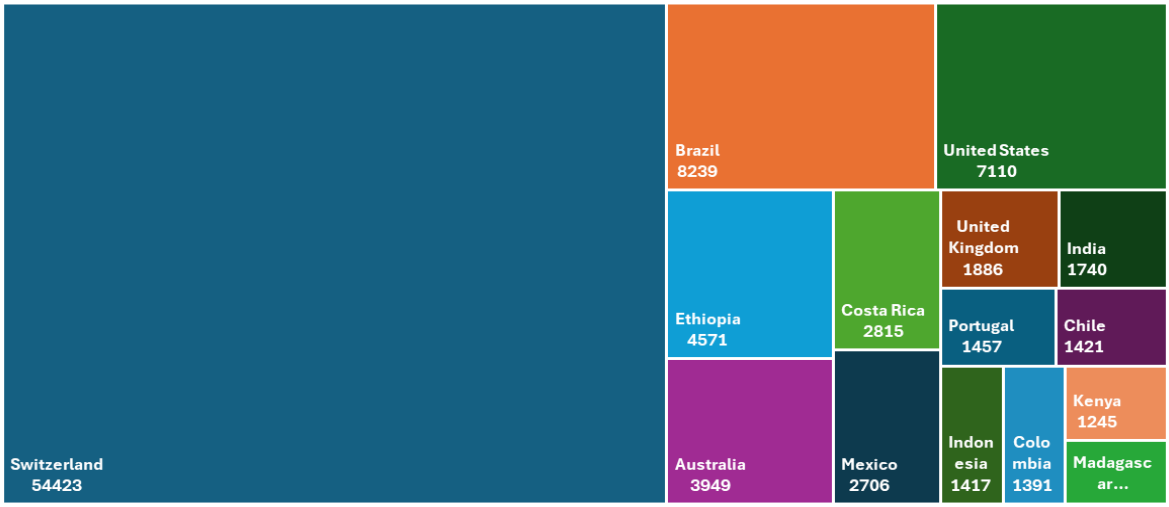


Figure 11: Number of sites reported for the top 15 countries (sized proportionally) in the RESTOR database.

d. RESTOR database

52. Restor is an open source and crowd-sourced online platform for reporting restoration projects or activities by organisations or individuals. In many instances, projects reported in RESTOR are also highly localised. In total, there are approximately 106,000 public sites listed in the online portal; however, the projects are not linked or searchable by habitat types or ecosystem categories, which makes it difficult to assess the proportion of projects related to freshwater ecosystems. As in the case of the Restoration Barometer, however, it still provides an overall idea of the countries who

are actively involved in restoration activities and are participating in sharing their activities openly. Switzerland boasts the highest number of sites (n=54,423) followed by Brazil (n=8,283), and the United States (n=7118) (Figure 10). The countries with the largest number of reporting organizations are Kenya (n=358 organizations), India (n=277 organizations), and Nigeria (n=233 organizations).

e. National reports to the Convention on Wetlands

53. National reports are voluntary, completed by country representatives with information regarding the country's progress on the implementation of wetland goals and commitments. The Conference of the Parties (COP) represents the core decision-making body attended by government representatives like ministers and officials from countries that have ratified the Convention. Observers and partners include international and regional organizations, scientists, experts, and civil society groups, and private sectors involved in wetlands conservation. The Plan 4th Strategic Plan (2016-2024) emphasises national reporting as the basis for tracking implementation of targets. However, it lacks specific quantitative targets which reduces the Convention`s ability to assess integral progress in wetland restoration. Nonetheless, general national implementation progress can be conceptualized using information provided by the Contracting Parties.

Table 9: Continental participation in COP events by number of countries and percentages by region.

	COP10 (2008)		**COP11 (2012)**		**COP12 (2015)**		**COP13 (2018)**		**COP14 (2022)**		**AVG**
Continent	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*%*
Africa	41	76%	47	87%	46	85%	50	93%	31	57%	80%
Asia	25	52%	24	50%	20	42%	27	56%	24	50%	50%
Europe	44	100%	42	95%	35	80%	42	95%	41	93%	93%
Latin America & Caribbean	24	75%	23	72%	22	69%	22	69%	21	66%	70%
North America	3	100%	3	100%	3	100%	3	100%	3	100%	100%
Oceania	5	36%	7	50%	5	36%	6	43%	4	29%	39%
n countries	**142**		**146**		**131**		**150**		**124**		

54. At a regional level, Europe and North America consistently have the highest COP participation. Africa's participation is high but fluctuates; Latin America and the Caribbean's participation is moderate; Asia and Oceania have the lowest participation (Table 9). This highlights the possible influence of institutional or political stability in well-represented regions and potential logistical, financial, or political constraints in underrepresented regions. Strategies are needed to enhance participation from underrepresented regions and ensure equitable global representation in wetland and climate negotiations.

55. In terms of priority wetland restoration sites identified between COP 10 and 12, most countries (67%-70%) identified some restoration sites, while few (15%-16%) did not identify any. The percentage of countries with planned restoration sites remained relatively stable (12%-16%) (Table

10). From COP 13 to 14, more countries identified sites (43% to 53%), and fewer had no sites identified (17% to 10%) (Table 11; Table S8).

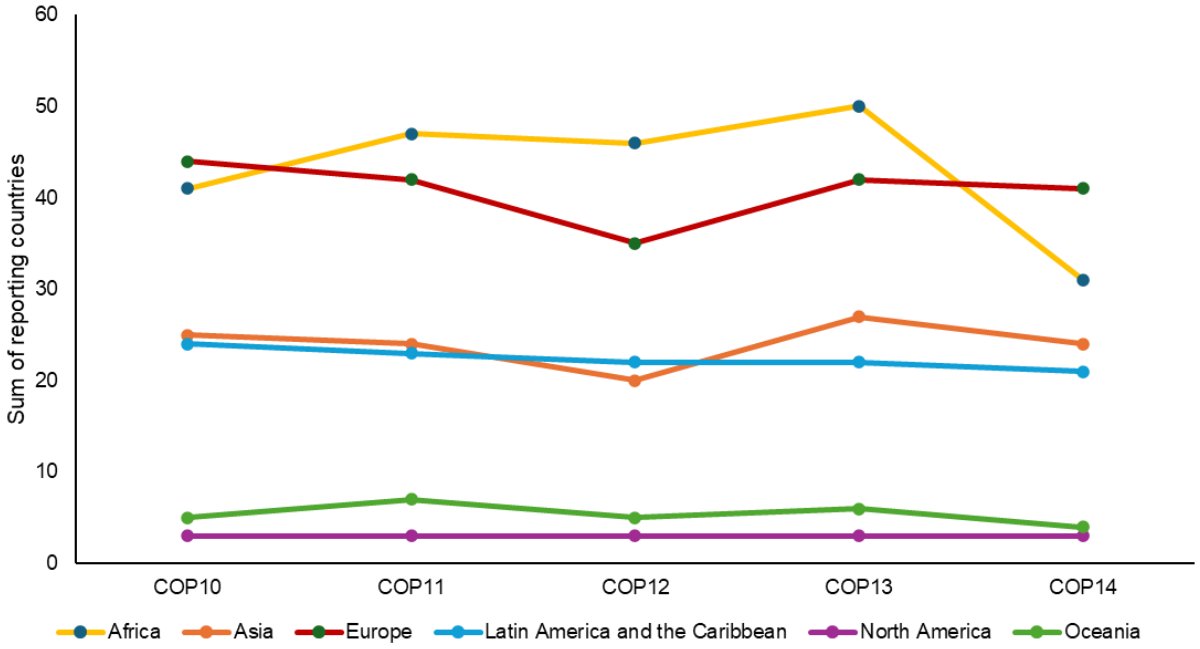


Figure 12: Trends of the sum of countries in each region (colors) reporting on national progress towards restoration to the Convention on Wetlands (x-axis) over time from COP10 to COP14 (y-axis).

Table 10: Number and percentage of countries by continent that identified priority wetlands restoration sites (Yes), did not identify sites (No), or had planned sites (Planned) across COP10, COP11, and COP12.

Wetland restoration sites identified	Yes		No		Planned		(blank)		Total
	n	%	n	%	n	%	n	%	
COP 10 (2008)	**95**	**67%**	**23**	**16%**	**23**	**16%**	**1**	**1%**	**142**
Africa	25	*61*	11	*27*	5	*12*			41
Asia	18	*72*	4	*16*	3	*12*			25
Europe	33	*75*	2	*5*	8	*18*	1	*2*	44
Latin America & Caribbean	13	*54*	6	*25*	5	*21*			24
North America	3	*100*		*0*		*0*			3
Oceania	3	*60*		*0*	2	*40*			5
COP 11 (2012)	**99**	***68%***	**25**	**17%**	**21**	***14%***	**1**	**1%**	**146**
Africa	28	*60*	12	*26*	6	*13*	1	*2*	47
Asia	17	*71*	5	*21*	2	*8*			24
Europe	33	*79*	3	*7*	6	*14*			42
Latin America & Caribbean	13	*57*	4	*17*	6	*26*			23
North America	3	*100*		*0*		*0*			3

Oceania	5	*71*	1	*14*	1	*14%*			7
COP 12 (2015)	**92**	***70%***	**20**	**15%**	**18**	***14%***	**1**	**1%**	**131**
Africa	21	*46*	14	*30*	10	*22*	1	*2*	46
Asia	16	*80*	1	*5*	3	*15*			20
Europe	28	*80*	3	*9*	4	*11*			35
Latin America & Caribbean	19	*86*	2	*9*	1	*5*			22
North America	3	*100*							3
Oceania	5	*100*							5

Table 11: Percentage of wetlands restoration sites per category, including sites: identified (A), not identified (B), planned for future identification (D), and partially identified (C).

Category	***COP 13 (%)***	***COP 14 (%)***	***Difference***
Yes (A)	*43%*	*53%*	*+10%*
No (B)	*17%*	*10%*	*-7%*
Planned (D)	*7%*	*8%*	*+1%*
Partially (C)	*22%*	*21%*	*-1%*
Unknown (X)	*1%*	*2%*	*+1%*
Not Relevant (Y)	*5%*	*2%*	*-3%*
Blank	*5%*	*3%*	*-2%*

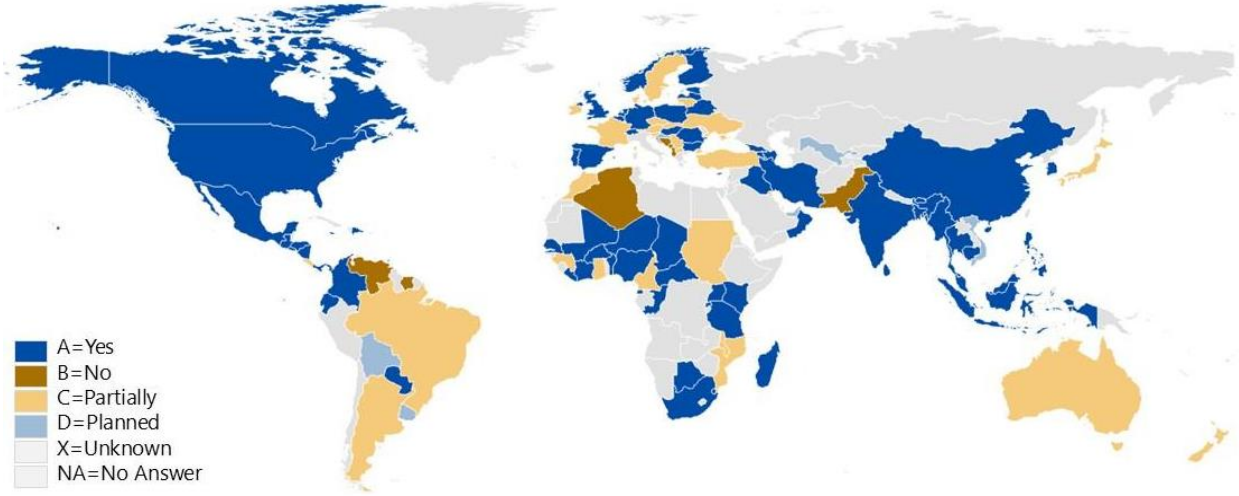
56. The number of wetland restoration sites identified increased by 11% from COP13 to COP15 (Table 12) and decreased by 41% in the number of countries without any prioritized sites. Priority sites in Asia dropped sharply from COP 13 (30%) to COP15 (5%), which was similar to the trends in Europe and Latin America. Only Africa shows a rebound in the number of restoration sites identified from COP 14 to COP 15 (16% to 23%), possibly indicating renewed efforts or strengthened regional coordination.

Table 12: Number and percentage of countries by continent that identified priority wetland restoration sites (Yes), did not identify sites (No), or had planned, partially, unknown, not related and blank (no answer) sites (Planned) across COP13, 14 and 15.

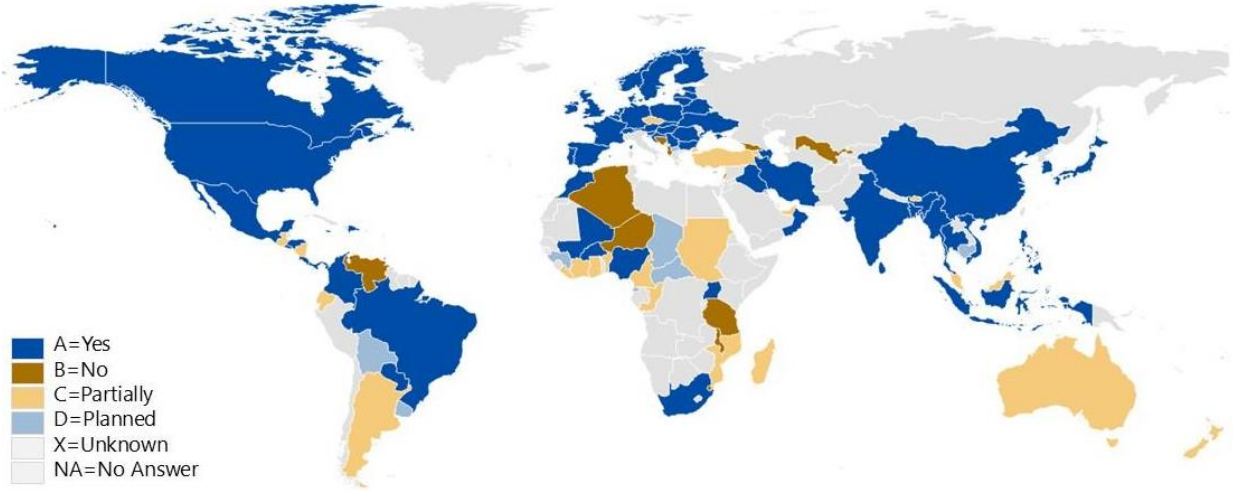
Restoration sites identified	**Yes**		**No**		**Planned**		**Partially**		**Unknown**		**Not Rel.**		**Blank**		**Total**
	n	*%*	**n**	*%*	**n**	*%*	**n**	*%*	**n**	*%*	**n**	*%*	**n**	*%*	**n**
COP 13	**64**	*43*	**25**	*17*	**11**	*7*	**33**	*22*	**2**	*1*	**8**	*5*	**7**	*5*	**150**
Africa	13	*26*	10	*20*	6	*12*	12	*24*			4	*8*	5	*10*	50
Asia	12	*44*	8	*30*	2	*7*	3	*11*			1	*4*	1	*4*	27
Europe	29	*69*	4	*10*	1	*2*	6	*14*			2	*5*			42

LA & Caribbean	6	*27*	2	*9*	2	*9*	10	*45*	1	*5*			1	*5*	22
North America	3	*100*													3
Oceania	1	*17*	1	*17*			2	*32*	1	*17*	1	*17*			6
COP 14	**66**	*53*	12	*10*	**10**	*8*	**26**	*21*	**3**	*2*	**3**	*2*	**4**	*3*	**124**
Africa	8	*26*	5	*16*	4	*13*	10	*32*	1	*3*			3	*10*	31
Asia	15	*63*	2	*8*	2	*8*	3	*13*			1	*4*	1	*4*	24
Europe	29	*71*	3	*7*	2	*5*	5	*12*	1	*2*	1	*2*			41
LA & Caribbean	10	*48*	2	*10*	2	*10*	5	*24*	1	*4*	1	*4*			21
North America	3	*100*													3
Oceania	1	*25*					3	*75*							4
COP 15	**49**	*44*	**11**	*10*	**9**	*8*	**34**	*30*	**2**	*2*			**7**	*6*	**112**
Africa	13	*43*	7	*23*	1	*3*	5	*18*	1	*3*			3	*10*	30
Asia	12	*60*	1	*5*			6	*30*					1	*5*	20
Europe	16	*39*	2	*5*	6	*15*	14	*34*					3	*7*	41
LA & Caribbean	7	*41*	1	*6*	2	*12*	6	*35*	1	*6*					17
North America	1	*50*					1	*50*							2
Oceania							2	*100*							2

a. Have national wetland restoration targets been established?



b. Have priority sites for wetland restoration been identified?



c. Since COP13, have wetland restoration programs, plans or projects been implemented?

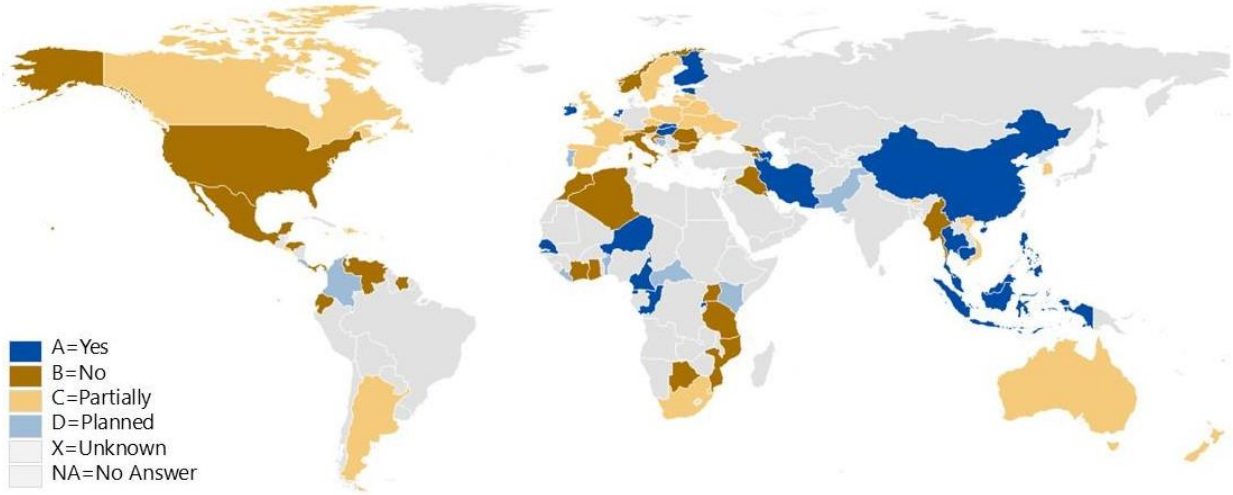


Figure 13: Summary maps of countries reporting to the Convention on Wetlands for COP14.

57. National reporting for the Convention on Wetlands shows a link to development status. Based on aggregated data with the Human Development Index (HDI), there is a clear disparity in participation. Countries with Very High Development status have the highest reporting percentage (38%) and the lowest proportion of non-reporting (19%) compared to the other HDI countries. High Development countries show an almost equal split between reporting (27%) and non-reporting (28%) while Medium and Low Development countries have the lowest reporting percentages (18% and 17%, respectively) and are among the highest non-reporting rates (27% for both). These disparities highlight potential challenges in technical or financial resources, conflicting conservation and development agendas, or a lack of access to reporting mechanisms (Table 13). Targeted support for data collection, capacity building, and integration into international reporting frameworks could help increase participation, particularly in Medium and Low Development countries, where wetlands are crucial for local livelihoods and ecosystem health.

Table 13: The percentage of countries reporting and not reporting national reports to the Convention on Wetlands by development status category (HDI).

HDI	REPORTING	NOT REPORTING
Very High Development	38%	19%
High Development	27%	28%
Medium Development	18%	27%
Low Development	17%	27%

58. National reports submitted to COP 15 show diverse and multifaceted strategies for wetland restoration reflected in achievements, challenges, and priorities (Table 14).

Table 14: Summary of wetland restoration achievements, challenges, and priorities derived from country reports submitted to the Convention on Wetlands for COP 15.

Achievements	Examples
Conservation and restoration actions	Tangible conservation and restoration efforts like ecosystem-based management, rewilding, and riverbed rearrangement to improve resilience
Site designations and protected areas	Expansion of site designations, establishment of protected areas and nomination of new sites; official gazettement processes ensure legal protection for additional wetlands
Governance, citizen participation, and awareness	Inclusive governance and public engagement; citizen participation mechanisms; public awareness campaigns and educational initiatives
Legal and institutional frameworks	Integration of wetlands into national laws, policies, and protected areas; establishment of policies and enforcement to ensure compliance
Commitments to international agreements	National Wetlands Plans; policy alignment with the KM-GBF, Convention on Biological Diversity, Sustainable Development Goals, etc.
Research, monitoring, and data integration	Data-driven conservation strategies, development of mapping and monitoring frameworks, national wetland inventories, species and habitat monitoring initiatives, and integrated national management tools
Partnerships and financial commitments	Public-private partnerships and financial commitments to support wetland conservation; leveraging national and international funding mechanisms; transboundary cooperation and joint management of shared wetlands
Challenges	
Financial and resource constraints	Lack of funds, insufficient financial support, and dependency on external resources; limited personnel, infrastructure, training, and equipment; reduced capacity for monitoring, enforcement, and policy execution
Governance, policy, and institutional coordination	Weak or outdated policies, bureaucratic inefficiencies, and lack of cooperation; absence of national wetland strategies, regulatory instruments, and cross-sectoral collaboration; political transitions that can hinder progress; poor alignment of conservation and development priorities
Land-use conflicts and development pressures	Urban expansion, infrastructure projects, and agribusiness lead to habitat loss and biodiversity decline

Climate change and environmental pressures	Climate change threats, included extreme rainfall, prolonged droughts, water scarcity, and flooding; ecological threats included nitrogen deposition, invasive species, and water flow reductions
Awareness, compliance, and engagement	Lack of public awareness and participation; limited familiarity with Convention provisions; inadequate training of wetland managers; absence of guidelines; poor enforcement mechanisms and low compliance
Priorities	
Inventory and monitoring	Update and implement national wetland inventories; integrate GIS and dynamic modeling for climate impact assessments
Governance and legal frameworks	Strengthen regulatory mechanisms, update national strategies, and improve legal frameworks for wetland protections
Conservation and restoration	Restore degraded wetlands; prioritise rehabilitation of wetland habitats and implementation of national conservation plans
Capacity building and awareness	Raise awareness about wetlands, promote an environmental culture, and foster indigenous and local community engagement
Financial and technical support	Secure funds and technical resources through fundraising and international cooperation
Sustainable use and "wise use principles"	Prioritise sustainable tourism, ecological balance, and wise-use to ensure long-term wetland benefits
Transboundary cooperation	Strengthen cross-border collaboration for improved coordination of wetland conservation
Climate change adaptation	Incorporate climate resilience into wetland strategies; use modeling and adaptation planning to mitigate climate change impacts

Synthesis of country reporting across Convention on Wetlands, FERM and Restor platforms

59. Of a total of 217 countries and territories, 113 of them submitted reports to the Convention on Wetlands, 50 have associated entries listed within the FERM platform (including GEF, SER, and FERM restoration efforts), and 174 have sites or organizations listed in the RESTOR open-source restoration reporting platform (Table S3). However, a total of 16 countries and 16 territories are absent from reporting to any of the above platforms (RESTOR, FERM, nor Convention on Wetlands national reports) about their wetlands. This poses a significant gap in global wetland restoration and monitoring (Table 15).

60. Small islands and coastal territories are especially important for wetland conservation because of their high biodiversity, vital ecosystem services and key roles in global ecological connectivity. Several of them do have protected areas (e.g., Belarus, Palau), which may contribute to wetland conservation but go unreported in larger frameworks for restoration. Their geographic locations enhance regional and global ecological connectivity, supporting migratory bird routes and nurseries, fisheries, ecotourism and climate resilience. Further, the lack of reporting does not necessarily imply inaction on conserving wetlands; instead, it might relate to a gap in data visibility, collaboration, or capacity for engagement in the global reporting process.

61. Strengthening partnerships, supporting data-sharing initiatives, and investing in local capacity for monitoring and reporting could help bridge these gaps. Given their ecological significance, integrating these countries and territories into global wetland restoration frameworks is crucial for achieving comprehensive and effective conservation outcomes. Their participation enhances global wetland resilience, and contributes to broader climate adaptation, biodiversity protection, and sustainable development goals.

Table 15: List of countries which have not reported in Convention on Wetlands national reports, FERM, nor RESTOR organizations or sites (n=16). Additional territories (n=16) that meet these criteria of non-reporting are: American Samoa, Saint-Martin, Pitcairn Islands, Cook Islands, Curacao, Turks and Caicos Islands, French Polynesia, New Caledonia, Montserrat, Brunei Darussalam, British Virgin Islands, Anguilla, United States Virgin Islands, Palestine, Northern Mariana Islands.

Country name	Important wetland types or areas	No. Wetlands of International Importance
Belarus*	2.5 million ha of wetlands, including Sporovsky peatland reserve and Pinsk marshes - some of the largest peatlands and marshlands in Europe	26
Bermuda	~50 ha of mangroves and swamplands; 50% reduction of coastal mangroves since 1900; one-third of inland wetlands have decreased and one half have increased in area	7
Guinea-Bissau*	Mangroves cover 338,652 ha (9.4%) (ranked first globally in proportional area covered by mangroves); 1,203 km² of tidal flats	4
Samoa*	402 km² of coral reefs and ~4.8 km² or 1270 ha of mangroves (represents less than 1% of global mangrove area)	3
Swaziland*	Wetlands cover only 0.25% of total land area but are important to endemic birds and mammals	3
Djibouti*	Ramsar wetland covers 3,000 ha; protected areas cover 355 km² (land) and 12 km² (marine)	1
Grenada*	~297 ha of mangroves across the major islands; recommended that approximately 50% of mangrove habitat should be protected	1
Monaco*	9.3 ha Ramsar site protects marine area and seagrasses, recently added a floating eco-district of reclaimed land	1
Palau*	966 km² of coral reefs support more than 1300 species of fish and 350 species of corals; 477,148 km² of marine area is fully protected	1
Fed. States of Micronesia	Covers > 6.7 million km² of the Pacific Ocean, including 4% of the world's coral reefs and 60% of known coral species.	0
Kosovo	Henc wetland is one of the most important wetlands in the country (50 ha); a full wetland assessment has not yet been conducted	0
Nauru	15 km² of coral reefs; 100% considered highly or very highly threatened	0
Qatar	~500 ha of mangroves cover the coastline; mangrove area has increased ~6% in the past 30 years	0

Saint Vincent & the Grenadines	168 km² of coral reefs with moderate to poor reef and habitat health, plus 0.7 km² of mangroves and 28 km² of seagrasses support	0
Tonga	1,662 km² of coral reefs and 3.36 km² of mangroves across more than 170 islands	0
Tuvalu	1,210 km² of coral reefs but less than 10% of coral reef area is currently protected	0

**Indicates countries with one or more Ramsar wetland sites (n=8 of the above countries).*

Local restoration efforts

62. Case studies also emphasize the disruption to wetland processes from human activities, leading to habitat loss, reduced ecosystem services, and increased flood risks. In the Mahakam Delta, for example, 60–75% of mangroves were converted to shrimp ponds, exacerbating erosion and habitat degradation (Bosma et al., 2012; Sidik, 2010) and in the Ganges-Brahmaputra Delta, embankments and upstream dam construction hindered sediment deposition, reducing agricultural productivity and accelerating land subsidence (Gain et al., 2017).

63. Specific types of restoration initiatives include temporary levee breaches to restore sedimentation and alleviate waterlogging (Adnan et al., 2019; Gain et al., 2017), dredging shallow, narrow channels to increase freshwater and sediment delivery to floodplains (Giosan et al., 2014), and automated tidal control systems (SmartGates) to simulate natural tidal regimes and promote the re-establishment of saltmarsh vegetation and sediment capture (Sadat-Noori et al., 2021).

64. Additional examples include constructing semi-permeable barriers to facilitate sediment deposition and reduce coastal erosion (Triyanti et al., 2017), river diversions to reintroduce sediment to deltaic plains by creating sediment deposition (Khalil et al., 2018; Day et al., 2016), mangrove replanting to promote natural recolonization, and rice cultivation channels to enhance land accretion (Ibáñez et al., 2010). These outcomes underscore the importance of integrating restoration into climate adaptation strategies.

65. Basin-scale case studies (Tables 16-19) highlight effective restoration efforts, innovative methodologies and successful outcomes at local scales. Identified through SER, IUCN, FERM, and the Restor database, the case studies demonstrate the dynamic and multidisciplinary nature of wetland restoration approaches.

Table 16: Summary of Chilika Lake local wetland restoration efforts.

Chilika Lake, India

February 20, 2014

November 02, 2022

Project description

Problem: Excessive silt (choking of the lake's inlet channel), salinity reduction, declining fish populations, biodiversity reduction, invasive species, and livelihood challenges.

Key actors and funding sources: Local communities, NGOs, international organizations, and the government, which provided financial support of more than $17 million.

Spatial and temporal scale: The entire Chilika Lake and its catchment area span 1,065 km². Restoration started in 1992, and with achievements by 2002, Chilika was removed from the Montreux Record.

Metrics used: Water quality parameters (monitoring of salinity levels, oxygen and clarity), biodiversity indicators (fish and prawn populations, bird counts, and species diversity), socio-economic metrics (e.g., income levels of local communities), and the Chilika Health Report Card (assessment of lake health).

Description of restoration activities

- Opened a new mouth to the sea to connect the lake directly to the Bay of Bengal, enhance tidal exchange, and restore salinity levels.
- Implemented participatory micro-watershed management to reduce silt inflow by involving local communities in soil conservation and afforestation efforts.
- Gained community engagement and livelihood support from training programs on sustainable fishing practices and eco-tourism as an alternative income source and opportunity to reduce fishing pressure.

Indicators of restoration success

- Ecological integrity: Improved water quality and stabilized salinity = resurgence of native species
- Biodiversity: Increased fish catch and the return of migratory bird populations
- Connectivity: The new sea mouth improved hydrological connectivity between the lake and the Bay of Bengal, facilitating nutrient exchange and species migration.
- Ecosystem function: Restoration efforts revitalized fisheries, bolstered eco-tourism, and provided flood protection to enhance the lake's ecosystem services.

Lessons learned and key takeaways

1. Community participation - Engaging local communities in planning and implementation fosters stewardship and ensures the sustainability of restoration efforts.
2. Ensuring integrated management approaches addresses both ecological and socio-economic aspects through a holistic strategy that leads to comprehensive restoration success.
3. Adaptive management and continuous monitoring - regular assessment and flexibility in management practices allow for timely interventions and sustained ecological balance.

Table 17: Summary of Murray River local wetland restoration efforts.

Coorong, Lower Lakes, and Murray Mouth (CLLMM) - Australia

January 16, 2015

November 02, 2022

Project description

Problem: Hydrological disruptions with over-extraction of water upstream; sediment accumulation that threatens estuarine functions and deteriorates water quality.

Key actors and funding sources: Basin authority, research institutes, Ngarrindjeri Nation, and conservation groups; Australian Government was the main funding source with more than $400 million reported since COP11, plus state and local government contributions, as well as research grants and NGOs support.

Spatial and temporal scale: Nearly 142,500 ha of wetlands including Coorong Lagoons, Lake Alexandrina, Lake Albert, and Murray Mouth. CLLMM restoration has been active since 2010, with long-term monitoring likely to extend beyond 2030.

Metrics used to evaluate restoration success: Hydrological metrics (water inflows, salinity levels), biodiversity indicators (migratory bird and fish monitoring; and aquatic vegetation recovery), soil and water quality (nutrient loads, acidity, presence of pollutants), community engagement metrics (number of conservation activities involving Indigenous and local groups), and long-term ecosystem monitoring (trends in ecological health across key sites).

Description of restoration activities

- Hydrological management and water flow restoration to restore natural wetland hydrology.
- Re-vegetation and habitat restoration to recover native plant species crucial for eco-resilience.
- Construction of fishways to improve migration of native fish species.

Indicators of restoration success

- Ecological integrity: Improved water flow connectivity.
- Biodiversity: Return of migratory shorebirds (red-necked stints, curlew sandpipers).
- Connectivity: Indigenous-led conservation initiatives that integrated traditional knowledge with monitoring efforts.
- Ecosystem function: Water purification, nutrient cycling recovery (reduction of algal blooms), and community engagement in conservation efforts.

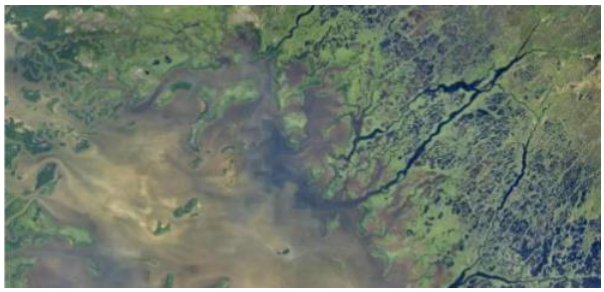
Lessons learned and key takeaways

1. Integrated water management - balancing water needs (agricultural, urban, nature) is essential.
2. Indigenous knowledge strengthens restoration (co-management approach with Ngarrindjeri Nation).
3. Climate variability requires adaptive strategies (i.e., flexible water allocations and long-term monitoring are necessary to ensure ecosystem stability).

Table 18: Summary of Everglades local wetland restoration efforts.

Everglades Restoration Plan - USA

February 20, 2014



January 1, 2024

Project description

Problem: Extensive water diversions, damming, and drainage for agriculture and urban development have disrupted natural water flows. Water pollution is widespread from agricultural phosphorus and nitrogen inputs. Habitat degradation, biodiversity loss, and reduction in wetland size pose concerns.

Key actors and funding sources: Federal and state agencies (US Army, SFWMD, FWS, NPS, EPA, FDEP and others); many nonprofit organizations (Everglades Foundation, Ducks Unlimited). Involved a multi-billion-dollar initiative with federal funds, land acquisition and nonprofits contributions.

Spatial and temporal scale: Long-term effort initiated in early 2000s; covers >46.619 Km² including Everglades National Park, Lake Okeechobee, Big Cypress National Preserve, Biscayne + Florida Bays.

Metrics used to evaluate restoration success: Water quality (e.g., phosphorus <10 ppb), water flow (flow rate), habitat recovery (submerged aquatic vegetation, wading birds), wildlife populations (e.g., alligators, wood storks), salinity monitoring, and carbon sequestration (soil organic matter, greenhouse gas flux).

Description of restoration activities

- Stormwater treatment areas were constructed to filter agricultural runoff (reduced P by 75% in water)
- Elevation of the Tamiami Trail roadway allowed natural water flow into Everglades.
- Everglades Agricultural Area Reservoir captured excess water, treated it, and slowly released it, reducing nutrient pollution and harmful discharges to coastal estuaries.

Indicators of restoration success

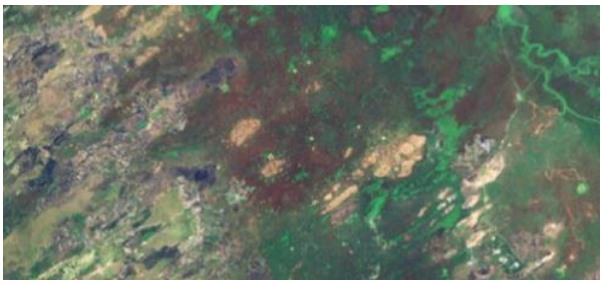
- Ecological integrity: Recovery of native plant species (e.g., sawgrass, periphyton communities), and reduction of algal blooms and eutrophication events.
- Biodiversity: Wading bird population recovery (wood storks, great egrets, roseate spoonbills), increased fish and alligator populations.
- Connectivity: Increased natural water flow that linked fragmented wetlands through new water storage areas; seasonal hydrology improvements benefited migratory species.
- Ecosystem function: Restored hydrological cycles benefited wildlife and human communities; carbon sequestration supported climate change mitigation; improved flood control increased water supply.

Lessons learned and key takeaways

1. Large-scale restoration requires long-term commitment and adaptive management to restore complex ecosystems, as well as regular funding and political support to maintain progress.
2. Science-based and multi-stakeholder collaboration are crucial for restoration implementation.
3. Addressing agricultural runoff and urban impacts is key for lasting restoration success (e.g., water management strategies like treatment areas and reservoirs reduced pollution and restored flows).

Table 19: Summary of Waza-Logone Floodplain rehabilitation efforts.

Waza Lagone Floodplain, Cameroon



February 20, 2014

November 02, 2022

Project description

Problem: Construction of the Maga Dam and Logone River embankments altered nearly 30% of the original floodplain, leading to ecological degradation, declining fish stocks, shrinking grazing lands, and wildlife habitat loss. As a result, communities experienced economic hardships from fewer available resources.

Key actors and funding sources: Managed by IUCN and implemented by the Cameroon Government, with principal funding from the Netherlands and support from the Netherlands Development Organisation.

Spatial and temporal scale: Covers over 8,000 km² in Cameroon's Far North Region. The initiative began in 1992 with pilot flood releases (1994, 1997). Restoration efforts continue via ongoing adaptive management

Metrics used to evaluate restoration success: Expansion of inundated areas post-flood releases, recovery of perennial grasslands, shifts in plant species composition, waterbird and antelope populations, fishery yields, livestock health and numbers, and community livelihoods through income and resource access.

Description of restoration activities

- Controlled flood releases: Opened blocked watercourses to reestablish natural flooding patterns.
- Community engagement and training: Eco-development, sustainable management of livestock, ecotourism, and water and sanitation projects; active participation from local communities.
- Development of management plans: Collaboration with stakeholders to develop and implement management plans for sustainable resource use in protected areas, such as Waza and Kalamaloue.

Indicators of restoration success

- Ecological integrity: Restoration of natural flooding regimes led to improved soil moisture, increased native vegetation, and stabilization of local ecosystems.
- Biodiversity: Notable increases in waterbird populations, with counts increasing from 59,000 (1993) to 87,000 (1997); recovery of fish species diversity and abundance.
- Connectivity: Reestablishment of hydrological links between rivers and floodplains, facilitating the movement and dispersal of aquatic and terrestrial species.
- Ecosystem function: Improved provisioning services, such as increased fishery yields and better grazing lands, supporting both wildlife and human livelihoods.

Lessons learned and key takeaways

1. Integrating community participation: Active involvement of local populations in planning and implementation fosters ownership and ensures the sustainability of restoration efforts.
2. Adaptive management: Continuous monitoring and flexibility to adjust strategies in response to ecological feedback are essential for long-term success.
3. Balancing conservation and livelihoods: Must address socio-economic + environmental objectives.

Tools to track restoration activities

66. Tracking restoration activities has become increasingly sophisticated thanks to technological advances, and now includes a variety of web-based applications, data-sharing portals, interactive tools, and collaborative platforms (Table 20).

Table 20: Examples of technological tools and platforms for tracking wetland restoration.

Tool	Description	Institution	Scale
Restoration Opportunities Assessment Methodology (ROAM)	A resource developed by IUCN and the World Resources Institute as a tool for countries to conduct forest and landscape restoration opportunity assessments and identify priority areas at national or subnational scales	IUCN	Global
Ramsar Sites Information Service (RSS)	A platform with an interactive mapping tool to access spatial data on the condition of Ramsar wetlands of international importance	Convention on Wetlands	Global
Framework for Ecosystem Restoration Monitoring (FERM)	Interactive portal for reporting restoration; developed for users or Parties to enter restoration activities and descriptions	FAO Task Force on Monitoring	Global
System for Earth Observation Data Access, Processing and Analysis for Land Monitoring (SEPAL)	Interactive website for users to understand data in their watershed and to help countries monitor and report on forests and land use by providing access to satellite data through a web portal	FAO	Global
Restor	Platform for open-source data entry and use; connects over 200,000 sites, 20,000 users, and 2,000 organizations to support restoration projects	RESTOR Network for Nature Positive Action	Global
Mangrove Restoration Tracker Tool (MRTT)	Data-sharing platform with the goal of conserving and restoring mangrove ecosystems	Global Mangrove Alliance (GMA)	Global
Restoration Resource Center (RRC)	Data-sharing platform to provide information for restoration practices, projects, conference presentations, and numerous restoration resources	Society for Ecological Restoration (SER)	Global
Global Coastal Wetlands Index App	Interactive web-based portal on the global status of coastal wetlands to inform conservation and management; includes 34 indicators of status and threats	The Global Wetlands Project	Global
Coral Reefs Dashboard & Coral Reefs Data Hub	Dashboard developed to track the status and outlook of coral reefs around the world	World Resource Institute (WRI)	Global
Marine Protection Atlas (MPAtlas) and MPA Guide	Open access database and web portal of marine protected areas and threats to marine ecosystems from the World Database on Protected Areas (WDPA) and self-reported data	Marine Conservation Institute	Global
Ocean+ Habitats	Living platform developed to provide decision-makers and communities of practice with the global information,	GEO BON, UN WCMC	Global

	knowledge and tools required to manage and conserve ocean ecosystems		
Mapping Ocean Wealth	Global partnership of scientists, policy makers and financial experts to map how and where ocean wealth is generated and valued	The Nature Conservancy	Global
Protected Planet	Interactive portal of protected areas and OECMs by country and around the globe, plus metrics on management effectiveness	IUCN, UNEP, WCMC	Global
Kelp Forest Challenge	Tracks kelp restoration projects and protection areas around the globe; allows searches by species, methodologies, organizations, and restoration reasons	Kelp Forest Alliance	Global
Aerial tools (general)	A review of unoccupied aerial vehicle use for wetland applications	Dronova, et al., 2021	Various
Watershed Planning Toolbox	A comprehensive resource for wetland and riparian restoration and conservation planning at the watershed scale	CO Wetland Information Center	Local

Available resources to guide science-based best practice wetland restoration activities

67. In addition to tracking tools for wetland restoration activities and progress, it is also important to highlight available resources developed to guide science-based best practices for wetland restoration (Table 21). For example, the International Coral Reef Initiative (2024) has compiled the most recent guidelines on coral reef restoration in a single source for users to reference and utilise in restoration planning. Other resources (e.g., 'Best Practice Guidelines for Mangrove Restoration' by the Global Mangrove Alliance) have been developed as a standalone resource for a single habitat type. Additional geographic-specific resources can be found in a list compiled by IUCN and the World Commission on Protected Areas (IUCN & WCPA, 2024).

Table 21: Examples of available tools and guidance to support science-based best practices for wetland restoration.

Resource name	**Description**	**Institution/authors**	**Target habitat**
Coral Reef Restoration Guidelines	A compilation of the most recent guidelines on coral reef restoration, compiled by Thomas Dallison.	International Coral Reef Initiative, 2021	Coral reefs
Restoration, creation, and management of salt marshes and tidal flats	Guidelines to support practitioners and decision-makers with evidence-based guidance of the restoration, creation, and management of salt marshes and tidal flats; served as the first module of the World Coastal Ecosystem Conservation Toolkit.	Cutts et al., 2024; Wetlands International	Salt marshes and tidal flats
Best practice guidelines for mangrove restoration	Guidelines developed to equip practitioners, governments, NGOs, scientists, local communities, industries, and funders with the best practices for science-based and inclusive mangrove restoration.	Beeston et al., 2023; Global Mangrove Alliance	Mangroves

Guidance on planning coastal restoration and setting targets	Provides guidelines for a stepwise approach to coastal habitat restoration using structured and systematic methodology. Intends to inform decision-making and adaptive management practices.	Gaffi et al., 2024; Wetlands International	Coastal habitats
Global guidelines for peatland rewetting	Provides technical guidance on peatland rewetting, especially with regional planners, site managers, and policy makers as the target audience.	Convention on Wetlands, 2021	Peatlands
Setting objectives for oyster habitat restoration using ecosystem services	A manager's guide for setting long-term management and restoration goals to improve oyster habitat restoration. Also accompanied by an interactive webpage to calculate area needed to restore conditions to specific standards or levels.	Zu Ermgassen et al., 2016; The Nature Conservancy	Oyster reefs

RECOMMENDATIONS AND ACTIONABLE STEPS

Summary and Key Messages

The following recommendations draw on the assessment's findings and highlight priority actions to support more effective wetland restoration:

1. **Restoration and protection -** Prioritise conservation over restoration; incorporate 'no net loss' principles into national policies and planning processes; strengthen legal protection for wetlands and halt further loss and degradation; and expand and connect protected area networks.

2. **Restoration monitoring and data integration** - Address key data gaps; develop clear guidance to align national reporting under MEAs and platforms; encourage voluntary, complementary reporting at catchment-scales; establish long-term monitoring and adaptive management systems that engage local stakeholders; and support capacity-building to improve national tracking systems.

3. **Policy, finance and enabling instruments** - Mobilise long-term funding through national budgets, public-private partnerships and biodiversity finance mechanisms; incentivise wetland restoration through economic instruments; and integrate wetlands into development planning and natural capital accounting.

4. **Governance and participation** - Ensure inclusive governance that enables indigenous peoples, local communities and other wetland users; enhance cross-sectoral coordination and leverage existing structures; and mainstream wetland restoration into sector-specific strategies and investment plans.

5. **Nature-based solutions and innovation** - Scale up nature-based solutions as part of integrated strategies for climate adaptation; use constructed wetlands strategically where appropriate; and support innovation, applied research, and traditional knowledge systems that enhance restoration effectiveness.

68. In light of the accelerating global impact of human activities on biodiversity and ecosystems, and the significant discrepancy between national commitments and actual restoration efforts, there is an urgent need to transition from pledges to execution, backed by policy coherence, funding and institutional capacity. This report summarises information that highlights several key findings, recommendations and gaps, pointing to strategic action steps for the near and long term to restore wetlands.

Identifying priority areas for wetland protection, conservation, and restoration

69. Recognising financial and practical limitations, prioritisation of wetland areas for conservation and restoration is necessary to identify areas of highest need for investments. Several efforts have worked to bring these areas into focus and help direct resources to the most strategic locations. One recent effort integrated wetland conservation value and human impact-related indicators to identify global areas of wetland conservation priority (Yi et al., 2024). In total, priority areas cover 28.3% (8.73×106 km^2) of the global potential wetland distribution (Yi et al., 2024; Figure 14).

70. The highest priority areas (e.g., Level 1; scored as 80-100) cover 6.8% of global wetland area, followed by 16.9% (Level 2; scored as 75-80), 3.8% (Level 3; scored as 70-75), and 0.8% (Level 1; scored as 60-70) (Yi et al., 2024). This effort highlights areas of highest priority which include northern latitude peatlands (Canada, Russia), river-floodplains of India and Nepal, much of the Amazon, much of the island regions of Papua New Guinea and Indonesia, and vast areas of sub-Saharan Africa including the Congo and Zambezi river-floodplain regions.

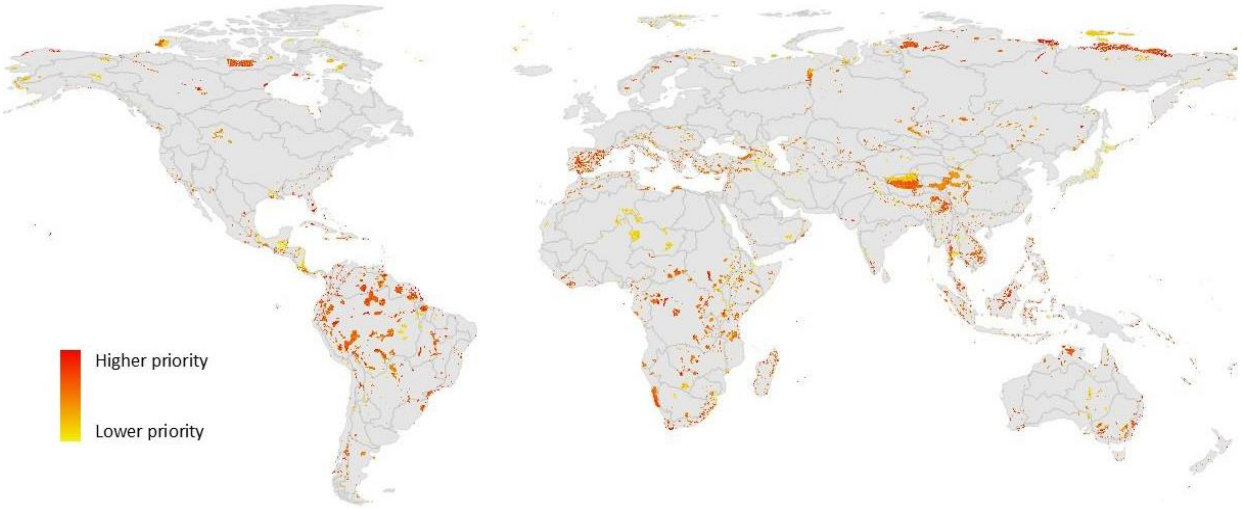


Figure 14: Global wetland conservation priority areas (Yi et al., 2024).

71. Another recent effort identified global priority areas for ecosystem restoration (though not explicitly focused on wetlands) with a focus on biodiversity (Strassburg et al., 2020; Figure 15). While Figure 14 shows conservation priority areas, this effort focused on areas for restoration (Figure 15). While many similarities exist, the northern peatland and central Amazon regions appear noticeably different, likely because they are not yet degraded but highly important (Figure 15). Understanding and synthesising the areas flagged in these two studies illuminates useful hotspots for current protections and future restoration efforts. Importantly, however, global scale maps like these may not always identify all priorities due to the datasets used and questions asked, especially as they relate to, or are applied to, wetlands. The high resolution of these efforts allows countries and regional planning bodies to utilise the information at watershed or localized scales and consider the importance of connectivity between currently protected areas and new areas.

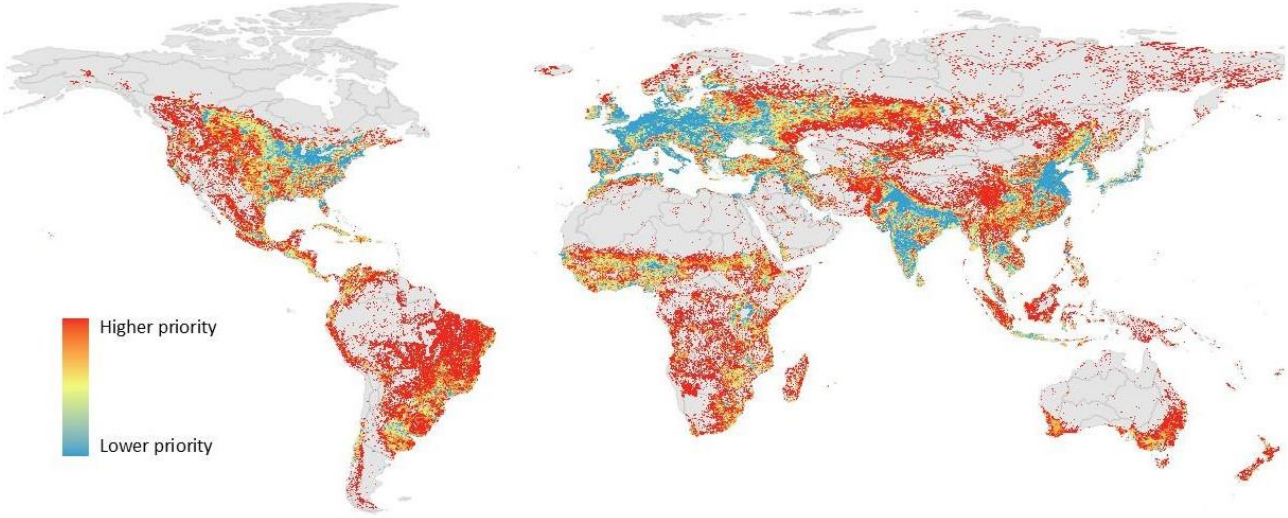


Figure 15: Global priority areas for ecosystem restoration with a focus on biodiversity conservation (Strassburg et al., 2020).

Key findings

72. **Global degradation of wetlands continues to occur at concerning rates, with an average loss of at least half of all wetlands globally** (over the past 30 to 100 years). It is estimated that the following have been lost: 21 to 70% of total inland wetland area, 50% of warm-water coral reefs, 20 to 50% of saltmarsh areas, 50% of coastal wetlands, 20 to 35% of all mangrove cover (1980-2010), and 30% of all seagrass areas (1970-2000) (Fluet-Chouinard et al., 2023; Crooks et al., 2011; UNEP-WCMC et al., 2021).

73. **Recognition of the importance of wetlands and severity of degradation is evidenced by widespread and highly ambitious targets for wetland restoration**. In total, global initiatives, regional projects, and country-level efforts have ambitions to restore at least 14,000 ha of mangroves, 300,000 kilometers of rivers, 44 million ha of wetlands in 20 countries (reported in FERM), 350 million ha of wetlands, and 450 million ha of degraded terrestrial landscapes (including inland waters).

74. **Wetland restoration activities and associated reporting are taking place in approximately three-quarters of countries**. For example, the majority of countries (n= 124 to 150; 64-77%) are submitting national reports to the Convention on Wetlands or have reported restoration sites in the RESTOR platform (n~80% of countries). However, only 32 countries have reported restoration activities in FERM (20 of which reported areas under restoration), which is where the more official country reporting occurs. In many places, local or privately driven restoration activities are not yet being counted toward country commitments.

75. **Participation by countries not yet engaged in restoration activities or reporting** (within globally-recognised frameworks) **is critical for the success of global wetland restoration efforts.** Implementation alone is one step but also participating in global reporting efforts is just as important for measuring global impact.

76. **Wetland restoration reporting is substantially lacking.** Even with new tools, estimating the area of wetlands under restoration largely still relies on country reporting, which is insufficient at the current reporting levels. Unlike restoration targets and commitments, which are well established globally, areas under restoration are not widely calculated and summarized. However, tools are being developed (e.g., FERM, Mangrove Tracker; Table 20) to aid in reporting restoration implementation.

77. **Reporting restoration area solely as the area of active intervention (area treated) often substantially underestimates the area of intended benefits (area impacted by treatment) and therefore fails to accurately reflect restoration benefits**. This is largely due to the high diversity in types of wetlands globally and their function and structure. For example, the average coral reef restoration project is just 100 m^2, yet can contribute to vast improvements in biodiversity and ecosystem functioning. Similarly, peatlands represent only 3% of the world's terrestrial land area but are highly important to global carbon dynamics.

Key gaps

78. One substantial gap revealed through this synthesis is the disparate nature of data sources, user platforms, interactive portals, and summary reports. The diversity of sources located across NGO, government, private cooperation, and individual initiative websites requires expert knowledge to locate, understand, and utilise them. Key databases on wetland restoration include those developed by FERM, RESTOR, GEF, CIFOR, Restoration Barometer, SER, and the Convention on Wetlands.

79. Production of data does not appear to be a pressing gap; instead, the bigger gap appears to be the dissemination, usability, and actionability of data. Data synthesis and science communication mechanisms can build capacity to connect data to users and decision-makers and communicate pertinent findings in understandable and relevant ways to users and decision-makers.

80. Proportionally, the area of protected wetlands is relatively small. For example, globally, only 16% of river reaches are protected (Abell et al., 2017) and 16% of the world's wetlands are protected under IUCN I-VI (Reis et al., 2017).

81. Although the majority of wetland activities are reported at the national level, this scale does not accurately or fully reflect the most hydrologically and ecologically meaningful scale for wetland areas (e.g., catchment boundaries). Therefore, there is a need to build capacity and training to promote and equip representatives to report restoration efforts at watershed scales.

82. Metrics for reporting progress towards restoration and indicators of restoration success are variable and largely reflect the direct area under restoration activities (rather than the area upstream or within the watershed more holistically). Using tools like FERM, which now allow users to select watershed areas to document areas under restoration, countries and organizations can more easily and accurately report areas under restoration.

83. Current outcomes appear to focus primarily on outcomes of restoration projects. However, valuation of the process (e.g., celebrating small successes or wins along the way of working towards an ultimate goal) may be useful for garnering support and stakeholder involvement. Similarly, long-term monitoring does not yet appear to be a major priority for funding agencies or policy makers but is required to allow adaptive management and ensure ultimate successes.

Recommendations and action steps

84. Looking ahead, there are fundamentally three approaches to wetland conservation along the mitigation hierarchy: (1) protect and conserve existing wetlands, (2) restore degraded wetlands, and (3) build new wetland areas. **Protecting existing wetlands and halting the loss of existing wetlands is the highest priority action globally because existing wetlands are irreplaceable in function and services.** Protecting these wetlands from further degradation, pollution, and development is crucial for maintaining the ecosystem services they provide. Conservation efforts should focus on strengthening legal protections, reducing human-induced threats and impacts, and ensuring sustainable management practices.

85. Second, **if protection or halting wetland loss are not possible, restoring degraded wetlands is the second priority.** Restoration can never replace what was lost in full (a recovery gap nearly always

exists) but it can, in many instances, provide a functioning ecosystem with many similar services. Restoring wetlands that have been drained, polluted, or otherwise degraded due to agricultural, industrial, or urban development can bring back lost ecological functions, enhance biodiversity, improve human health and wellbeing, and help mitigate climate change by increasing carbon sequestration. Restoration is often more cost-effective than offsetting impacts by creating new wetlands from scratch. Wetland restoration can focus on restoring hydrology (water flow), native vegetation, and soil properties to bring the wetland back to a healthy state. Restoration can also improve water quality, enhance habitat for endangered species, and restore ecosystem services like flood control, all of which benefit human health and wellbeing as co-benefits.

86. Finally, if the above options are not possible, or to supplement those activities, **constructed wetlands can be an option for increasing wetland area**. In some cases, where natural wetlands are lost or when specific ecosystem services are needed (e.g., wastewater treatment, stormwater management), constructing new wetlands can be beneficial. These constructed wetlands can provide valuable services, particularly in urban or industrial areas, but they cannot fully replace the biodiversity and ecological complexity of natural wetlands. As such, they should be considered as supplementary to the conservation and restoration of natural wetlands rather than as a replacement.

Figure 16: The four approaches to managing wetlands in the midst of global environmental change.

87. This assessment highlights actions important to the development and implementation of policies, strategies, and action plans in wetland restoration. **While the general trend points to increasing commitments for wetland restoration, long-term investments in the implementation of projects and in monitoring are much less established and warrant immediate attention**. Increasing engagement, capacity building initiatives and cross-regional collaborations may further strengthen implementation efforts through knowledge and data sharing initiatives and cooperative partnerships. The following actions are therefore recommended aims to improve progress towards global wetland restoration, which can be categorized as (1) restoration, (2) monitoring and data, (3) policy and protection, (4) governance and participation, and (5) nature-based solutions. Integrated spatial planning is particularly important as a tool that supports policy decisions related to wetland restoration (e.g., KM-GBF Target 1).

Strengthen restoration commitments and increase wetland protection

88. **Halt further loss and degradation of wetlands by enforcing legal protection and strengthening policies against drainage**. Despite global efforts and increased recognition of the value of wetlands, the degradation of wetlands continues. In turn, the first priority should be to halt the degradation of wetlands. This includes reducing local threats to marshes, reefs, rivers, lakes, floodplains, and riparian zones and removing the stressors and pressures on wetlands as a best practice for preventing further loss and degradation. Actions may include managing fisheries sustainably, eliminating destructive fishing, decreasing point and nonpoint pollution into waterways, and sustainably managing coastal and inland development. In addition, strengthening and enforcing regulations can help to prevent harmful actions like dredging, wetland drainage, dams and other impediments.

89. **Expand protected area networks to cover at least 30% of degraded wetlands, in line with KM-GBF Target 3.** This may include establishing, expanding, and effectively managing protected areas and other effective area-based conservation measures using evidence-based integration and synthesis of the intersection of wetland extent, current protected areas, and watershed dynamics. In addition, while in theory, protected areas are developed to conserve or restore biodiversity and improve ecological function and structure, this is often not the case for fresh waters, which may even be subject to negative impacts from the poor design of protected areas (Acreman et al., 2019). As such, consideration of freshwater dynamics is needed to improve the design and implementation of protected areas globally.

90. **Prioritise conservation over restoration, ensuring that remaining wetlands are effectively managed before investing in costly restoration.** One important aspect of restoration is incentivising strategic actions in alignment with watershed scale restoration and disincentivising actions driving further degradation and land conversion. This also includes recognition that restoration is not a substitute for protecting and wisely using wetlands (e.g., potential to restore a wetland is not justification for continued degradation).

Improve restoration reporting and monitoring

91. **Harmonise global reporting systems to improve data accessibility and interoperability.** Ample global datasets (e.g., FERM, RESTOR) synthesise the extent and degradation of wetlands and numerous tools have been created to support the reporting of wetland areas under restoration. Yet, sources are disparate and, in many cases, challenging to locate without prior knowledge of existing efforts to create tools. As such, integrating and aligning systems and tools for reporting on the extent, degradation, and restoration of wetlands is necessary. To this note, the forthcoming 5th Strategic Plan by the Convention on Wetlands will likely include new indicators on restoration.

92. **Adopt catchment-scale reporting rather than administrative boundaries to more accurately track restoration outcomes.** Acknowledge the transboundary nature of waterways and their associated ecosystem services and functions and encourage reporting mechanisms to allow for synthesis of data and monitoring across boundaries.

93. **Establish long-term monitoring and adaptive management plans to ensure resilience for restored wetlands amidst continued change.** Users and managers should consider utilising available tools

for monitoring, such as the FAO guidelines for basin-level restoration monitoring (Steel et al., 2025). Monitoring plans should identify the role of users in the design and implementation processes. Ideally, users, actors, and stakeholders play a role (e.g. capacity building) throughout the entire restoration process.

Enhance funding and resource mobilization

94. **Increase financial investment in wetland restoration through dedicated funding mechanisms** (e.g. climate finance, public-private partnerships). Financial constraints remain a major barrier to wetland restoration and conservation. To address this, countries must secure stable, long-term funding beyond short-term project-based financing. Strengthening public-private partnerships, leveraging national and international funding mechanisms, and fostering transboundary cooperation are essential strategies. Establishing multi-year funding models may also enhance the effectiveness and sustainability of wetland conservation efforts.

95. **Incentivise wetland restoration through tax incentives, market-based instruments, and carbon credit schemes**. In doing so, wetland restoration can be incentivised in a way that is economically attractive and beneficial to both landowners and businesses, while also delivering significant environmental benefits. For example, tax incentives can provide direct financial benefits to those engaging in wetland restoration, including tax credits or reductions for landowners who voluntarily protect and restore wetland areas on their property. Restoring wetlands also offers an opportunity to generate carbon credits through verified emissions reductions and carbon offset programs.

96. **Integrate the value of wetlands into national and natural capital accounting and elevate their services** (especially climate mitigation) **in budget allocations and economic development frameworks**. Recognise specifically the impacts of climate change and the potential role of wetlands in climate mitigation and adaptation. Decision-makers should take immediate and appropriate measures to recognise the full suite of environmental, cultural, and socio-economic benefits gained from wetlands restoration. Raising awareness of the value of coral reefs, coastal ecosystems, mangroves, marshes, and inland wetlands includes awareness of the cost of protection versus the cost of degradation and loss (Costanza et al., 1997). Involving multiple sectors across the land-water interface is key (e.g. forestry, fisheries, water management, and coastal development actors).

Promote inclusive and participatory restoration

97. **Ensure the involvement of indigenous peoples and local communities in wetland restoration plannin**g and encourage active participation by all watershed users. This includes encouraging inclusive participation in the creation and implementation of restoration goals and indicators (e.g., enhanced connectivity, ecological integrity, biodiversity, and ecosystem function and services), including governance systems that cross sectors and empower stewardship and underrepresented perspectives. This also includes the use of cooperative processes for developing indicators, goals, and governance processes (e.g., community-led restoration, co-management, co-production).

98. **Recognize the importance of gender inclusion for effective and equitable management of wetlands.** Women are often deeply involved in wetland-based livelihoods but continue to face systemic barriers to land ownership, resource access, and decision-making processes (Aguilar, 2021). A gender-responsive approach recognizes the distinct needs, knowledge, and contributions

of both women and men, fostering more sustainable and just conservation outcomes. Addressing gender inequalities—rooted in sociocultural norms and legal constraints—is essential to ensuring that wetland management is both complete and equitable. Empowering women enhances biodiversity protection, regulatory compliance, and community resilience. Moreover, gender equity is a critical consideration when designing plans that aim for fair distribution of benefits. Integrating transdisciplinary approaches further strengthens these efforts by aligning restoration outcomes with local, community, and place-based needs.

99. **Encourage cross-sectoral collaboration between ministries of the environment, agriculture, industry, water management and urban planning**. Enhancing and organising partnerships and organisations, like integrating users into basin management organisations and governance structures, can foster buy-in and continuity of engagement. Key stakeholders and users may ensure that restoration efforts are institutionalised and support long-term monitoring and accountability for watershed systems resilience. Leveraging existing capacities and decision-making structures within organisations, such as basin management organisations, regional fishery bodies, and other existing networks for water resource management, fisheries, forestry, and agriculture, is also key for long-term success.

Leverage nature-based solutions and innovative technologies

100. **Utilise constructed or human-made wetlands for services (such as water treatment or flood mitigation) in appropriate contexts**. In cases where natural wetlands are heavily degraded or natural restoration is not feasible, promote the use of constructed wetlands to mimic the structure and function of natural wetlands. These can include floating islands, synthetic peat moss, and constructed wetland cells that provide some key ecological services in urban areas.

101. **Incorporate nature-based solutions** (e.g. mangrove reforestation, river reconnection) **into national climate adaptation strategies and leverage NbS co-benefits for local communities.** Examples include utilizing smart water management technologies, promoting natural regeneration, using biotechnologies to stabilise soils in areas vulnerable to soil erosion, and using bioengineering techniques to remove excess nutrition. National strategies may also benefit from promoting the restoration of coastal wetlands, mangroves, and salt marshes as blue carbon ecosystems to take advantage of their high carbon sequestration potential.

102. **The current moment is critical for wetlands**, as increasing rates of wetland degradation warrant immediate actions to halt wetland loss and effectively implement restoration strategies. Several decades ago, the focus within ecological restoration largely focused on understanding the process and principles of restoration. Now, **the tools, foundational knowledge, and guiding principles to do so exist in many forms and the scientific evidence has been well-formulated to guide restoration processes.** Yet, one core challenge is transferring academic knowledge and complex datasets and tools into the hands of users. For example, evidence-based conservation and restoration planning needs to reflect the correct scale of catchment dynamics. These concepts may not be feasible to be incorporated by countries or regional managers without improved capacities and training.

103. With many ambitious restoration commitments already made, there is **an opportunistic window of tracking restoration efforts in real time and effectively understanding metrics** of long-term success. The Convention on Wetlands has a key opportunity to leverage national reporting

information to capture these actions and benefits. Through the Convention on Wetlands or other governing bodies, leveraging the vast resources presented in this report and making them available to users and constituents for immediate application will also be important for maximizing benefits and catalyzing the current momentum of activities.

104. The vast and disparate nature of global wetlands and the rapid changes they are undergoing necessitate creative and innovative approaches for monitoring and assessments. Simultaneously, rapid advances in technology and remotely-sensed data products can be challenging for users without specialised training to use and integrate. As such, **maximising benefits from multiple data sources is important**. For example, understanding the role and need for field-based data (e.g., where field-based data can fill gaps not attained by satellite data) and how it can be effectively paired with the spatial and temporal resolution of remotely sensed data can help to minimise costs and maximise monitoring information.

105. In addition, harnessing the current momentum of restoration into long-term monitoring, especially amidst climate change, will be essential to **ensure long-term protections of restoration sites and continued ecological repair** where intensive actions were made. Examining successful restoration efforts with long-term monitoring, including the case studies highlighted in this report, can provide examples of creative approaches to secure funding. Wetlands are distinctly positioned at the land-water interface and across multiple sectors at the food-water-energy nexus. As such, wetland restoration efforts have the opportunity to garner support across basin management organizations, fisheries management organizations, forestry organizations, and water resource management organizations.

106. Ultimately, improving **the state of global wetlands is in the interest of all humans, as life on land hinges upon the availability, quality, and quantity of water resources.** Improving the valuation of wetlands and their ecosystem services and improving the recognition of wetland restoration processes will help ensure continued success and continued provisioning of services from wetlands. Clear guidance, cohesive knowledge transfer, strategic capacity building, and strengthened partnerships will help to forge wetland restoration efforts and ensure the sustainability of global wetlands for ecological and human flourishing.

REFERENCES

Abell, R., Lehner, B., Thieme, M., & Linke, S. (2017). Looking beyond the fenceline: Assessing protection gaps for the world's rivers. *Conservation Letters*, *10*(4), 384-394. https://doi.org/10.1111/conl.12312

Acreman, M., Hughes, K. A., Arthington, A. H., Tickner, D., & Dueñas, M. A. (2020). Protected areas and freshwater biodiversity: A novel systematic review distils eight lessons for effective conservation. *Conservation Letters, 13*(1), e12684. https://doi.org/10.1111/conl.12684

Adnan, M. S. G., Dewan, A., Zannat, K. E., & Abdullah, A. Y. M. (2019). The use of watershed geomorphic data in flash flood susceptibility zoning: a case study of the Karnaphuli and Sangu river basins of Bangladesh. *Natural Hazards*, *99*, 425-448. https://doi.org/10.1007/s11069-019-03749-3

Aguilar, L. (2021). *Guidance on mainstreaming gender under the Ramsar Convention on Wetlands*. Secretariat of the Convention on Wetlands, Gland, Switzerland. https://www.ramsar.org/sites/default/files/guidance_on_mainstreaming_gender_en.pdf

Alexander, S. & McInnes, R. (2012). *The benefits of wetland restoration*. Ramsar Scientific and Technical Briefing Note No. 4. Ramsar Convention Secretariat, Gland, Switzerland. www.ramsar.org/bn/bn4.pdf

Beeston, M., Cameron, C., Hagger, V., Howard, J., Lovelock, C., Sippo, J., Tonneijk, F., van Bijsterveldt, C. & van Eijk, P. (eds.) (2023). *Best practice guidelines for mangrove restoration*. Global Mangrove Alliance. https://www.mangrovealliance.org/wp-content/uploads/2023/12/Best-Practice-Guidelines-for-Mangrove-Restoration_spreadsv5.pdf

Blume, A., Pertiwi, A. P., Lee, C. B., & Traganos, D. (2023). Bahamian seagrass extent and blue carbon accounting using Earth Observation. *Frontiers in Marine Science*, *10*, 1058460. https://doi.org/10.3389/fmars.2023.1058460

Bosma, R., Sidik, A. S., van Zwieten, P., Aditya, A., & Visser, L. (2012). Challenges of a transition to a sustainably managed shrimp culture agro-ecosystem in the Mahakam delta, East Kalimantan, Indonesia. *Wetlands Ecology and Management*, *20*, 89-99. https://doi.org/10.1007/s11273-011-9244-0

Bunting, P., Rosenqvist, A., Hilarides, L., Lucas, R. M., Thomas, N., Tadono, T., ... & Rebelo, L. M. (2022). Global mangrove extent change 1996–2020: Global mangrove watch version 3.0. *Remote Sensing*, *14*(15), 3657. https://doi.org/10.3390/rs14153657

Burke, L., & Wood, K. (2021). Decoding Coral Reefs: Exploring Their Status, Risks and Ensuring Their Futures. *World Resources Institute*, *13*. https://www.wri.org/insights/decoding-coral-reefs

Cadier, C., Bayraktarov, E., Piccolo, R., & Adame, M. F. (2020). Indicators of coastal wetlands restoration success: a systematic review. *Frontiers in Marine Science*, *7*, 600220. https://doi.org/10.3389/fmars.2020.600220

Convention on Wetlands (1990). *Recommendation 4.1: Wetland restoration*. 4th Meeting of the Conference of the Contracting Parties (COP4). Montreaux, Switzerland. https://www.ramsar.org/sites/default/files/documents/library/key_rec_4.01e.pdf

Convention on Wetlands. (1996). *Recommendation 6.15: Restoration of wetlands.* Proceedings of the 6th Meeting of the Conference of the Contracting Parties (COP6). Brisbane, Australia. https://www.ramsar.org/sites/default/files/documents/library/key_rec_6.15e.pdf

Convention on Wetlands. (1999). *Resolution VII.17: Restoration as an element of national planning for wetland conservation and wise use*. 7th Meeting of the Conference of the Contracting Parties (COP7) to the Convention on Wetlands. San José, Costa Rica. https://www.ramsar.org/sites/default/files/documents/library/key_res_vii.17e.pdf

Convention on Wetlands. (2002). *Resolution VIII.16: Principles and guidelines for wetland restoration*. 8th Meeting of the Conference of the Contracting Parties (COP8). Valencia, Spain. https://www.ramsar.org/sites/default/files/documents/pdf/guide/guide-restoration.pdf

Convention on Wetlands. (2012). *Resolution XI.9: An integrated framework and guidelines for avoiding, mitigating and compensating for wetland losses*. 11th Meeting of the Conference of the Parties to the Convention on Wetlands (COP11). Bucharest, Romania. https://www.ramsar.org/sites/default/files/documents/library/cop11-res09-e.pdf

Convention on Wetlands & UNCCD. (2014). Joint statement by the UNCCD and Ramsar Convention on wetlands and drylands. https://www.ramsar.org/sites/default/files/documents/library/wpc-pledge-ramsar-unccd.pdf

Convention on Wetlands. (2015). *Resolution XII.11: Peatlands, climate change and wise use: Implications for the Ramsar Convention*. 12th Meeting of the Conference of the Parties to the Convention on Wetlands (COP12). Punta del Este, Uruguay. https://www.ramsar.org/sites/default/files/documents/library/cop12_res11_peatlands_e.pdf

Convention on Wetlands. (2015). *The 4th Strategic Plan 2016 – 2024*. 12th Meeting of the Conference of the Parties to the Convention on Wetlands. Punta del Este, Uruguay. 4th_strategic_plan_2016_2024_e.pdf

Convention on Wetlands. (2016). *An Introduction to the Ramsar Convention on Wetlands, 7th ed*. (previously The Ramsar Convention Manual). Ramsar Convention Secretariat, Gland, Switzerland. https://www.ramsar.org/sites/default/files/documents/library/handbook1_5ed_introductiontoconvention_final_e.pdf

Convention on Wetlands. (2018). *Resolution XIII.13: Restoration of degraded peatlands to mitigate and adapt to climate change and enhance biodiversity and disaster risk reduction*. 13th Meeting of the Conference of the Contracting Parties to the Ramsar Convention on Wetlands (COP13). Dubai, United Arab Emirates. https://www.ramsar.org/sites/default/files/documents/library/xiii.13_peatland_restoration_e.pdf

Convention on Wetlands. (2018). *Resolution XIII.14: Promoting conservation, restoration, and sustainable management of coastal blue-carbon ecosystems*. 13th Meeting of the Conference of the Contracting Parties to the Ramsar Convention on Wetlands (COP13). Dubai, United Arab Emirates. https://www.ramsar.org/sites/default/files/documents/library/xiii.14_blue_carbon_e.docx

Convention on Wetlands. (2021). *Practical peatland restoration*. Briefing Note No. 11. Secretariat of the Convention on Wetlands, Gland, Switzerland. https://www.ramsar.org/sites/default/files/documents/library/bn11_practical_peatland_restoration_e.pdf

Convention on Wetlands. (2021). *Factsheet: Marine and coastal wetlands*. Secretariat of the Convention on Wetlands, Gland, Switzerland. https://www.ramsar.org/sites/default/files/documents/library/factsheet_wetland_restoration_coastal_e.pdf

Convention on Wetlands. (2021). *Factsheet: Wetland restoration – General*. Secretariat of the Convention on Wetlands, Gland, Switzerland. https://www.ramsar.org/sites/default/files/documents/library/factsheet_wetland_restoration_general_e_0.pdf

Convention on Wetlands. (2021). *Global guidelines for peatland rewetting and restoration*. Technical Report No. 11. Secretariat of the Convention on Wetlands, Gland, Switzerland. https://www.ramsar.org/sites/default/files/documents/library/rtr11_peatland_rewetting_restoration_e.pdf

Convention on Wetlands. (2021). *Restoring drained peatlands: A necessary step to achieve global climate goals*. Policy Brief No. 5. Secretariat of the Convention on Wetlands, Gland, Switzerland. https://www.ramsar.org/sites/default/files/documents/library/rpb5_restoring_drained_peatlands_e.pdf

Convention on Wetlands (2021). *Global Wetland Outlook: Special Edition 2021*. Secretariat of the Convention on Wetlands, Gland, Switzerland. https://static1.squarespace.com/static/5b256c78e17ba335ea89fe1f/t/61b8a904f3ceb458e9b5ca44/1639491853578/Ramsar+GWO_Special+Edition+2021%E2%80%93ENGLISH_WEB.pdf

Convention on Wetlands (*in press*). *Global Wetland Outlook: Special Edition 2025*. Secretariat of the Convention on Wetlands, Gland, Switzerland.

Costanza, R., d'Arge, R., de Groot, R., Farber, S., Grasso, M., Hannon, B., … & van den Belt, M. (1997). The value of the world's ecosystem services and natural capital. *Nature*, *387*(6630), 253–260. https://doi.org/10.1038/387253a0

Crooks, S., Herr, D., Tamelander, J., Laffoley, D., Vandever, J. (2011). *Mitigating climate change through restoration and management of coastal wetlands and near-shore marine ecosystems*. Environment Department Paper No. 121, The World Bank, Washington, D.C. http://hdl.handle.net/10986/18318

Cutts, V., Erftemeijer P. L. A., Gaffi, L., Hagemeijer, W., Smith, R. K, Taylor, N. G. & Sutherland, W. J. (eds.). (2024). *Restoration, creation and management of salt marshes and tidal flats: A collation of evidence-based guidance*. Report of Conservation Evidence, Wetlands International and the World Coastal Forum. https://doi.org/10.52201/CGSCOL1/LCNC6109

Davidson, N. C. (2014). How much wetland has the world lost? Long-term and recent trends in global wetland area. *Marine and Freshwater Research, 65*(10), 934–941. https://doi.org/10.1071/MF14173

Davidson, N. C. & Finlayson, C. M. (2018). Extent, regional distribution and changes in area of different classes of wetland. *Marine and Freshwater Research, 69*(10), 1525–1533. https://doi.org/10.1071/MF17377

Davidson, N. C., Fluet-Chouinard, E., & Finlayson, C. M. (2018). Global extent and distribution of wetlands: Trends and issues. *Marine and Freshwater Research, 69*(4), 620–627. https://doi.org/10.1071/MF17019

Day, J. W., Christian, R. R., Boesch, D. M., Yáñez-Arancibia, A., Morris, J., Twilley, R. R., ... & Stevenson, C. (2008). Consequences of climate change on the ecogeomorphology of coastal wetlands. *Estuaries and Coasts, 31*(3), 477–491. https://doi.org/10.1007/s12237-008-9047-6

Day Jr, J. W., Cable, J. E., Lane, R. R., & Kemp, G. P. (2016). Sediment deposition at the Caernarvon crevasse during the great Mississippi flood of 1927: implications for coastal restoration. *Water*, *8*(2), 38. https://doi.org/10.3390/w8020038

Dennis, T., Adson, T., Edwin, B., Ogwal, F. S., & Richard, K. (2024). Wetland Restoration and Conservation. Case of Uganda. *East African Journal of Environment and Natural Resources, 7*(1), 391–400. https://doi.org/10.37284/eajenr.7.1.2153

FAO, IUCN, CEM and SER. (2021). *Principles for ecosystem restoration to guide the United Nations Decade 2021–2030*. FAO, Rome, Italy. https://openknowledge.fao.org/handle/20.500.14283/cb6591en

FAO, SCBD & SER. (2024). *Delivering restoration outcomes for biodiversity and human well-being – Resource guide to Target 2 of the Kunming-Montreal Global Biodiversity Framework.* Rome, Montreal, Canada & Washington, DC. https://doi.org/10.4060/cd2925en

Fennessy, S.M. & Lei, G. (2018). *Wetland restoration for climate change resilience*. Ramsar Briefing Note No. 10. Ramsar Convention Secretariat, Gland, Switzerland. https://www.ramsar.org/sites/default/files/documents/library/bn10_restoration_climate_change_e.pdf

Framework for Ecosystem Restoration Monitoring (FERM) (2024). *FERM user guide* (November 2024 version). United Nations Decade on Ecosystem Restoration, Food and Agriculture Organization of the United Nations, & United Nations Environment Programme. https://ferm.fao.org/docs/ferm_user_guide_draft.pdf

Fluet-Chouinard, E., Stocker, B. D., Zhang, Z., Malhotra, A., Melton, J. R., Poulter, B., ... & McIntyre, P. B. (2023). Extensive global wetland loss over the past three centuries. Nature, 614(7947), 281-286. https://doi.org/10.1038/s41586-022-05572-6

Gaffi L., Cutts V., Hagemeijer W. & Sutherland W.J. (2024). *Guidance on planning coastal restoration and setting targets*. Conservation Guidance Series No. 2, v1.0. https://doi.org/10.52201/CGS/POLS6709

Gain, A. K., Benson, D., Rahman, R., Datta, D. K., & Rouillard, J. J. (2017). Tidal river management in the south west Ganges-Brahmaputra delta in Bangladesh: moving towards a transdisciplinary approach?. *Environmental Science & Policy*, *75*, 111-120. https://doi.org/10.1016/j.envsci.2017.05.020

Giosan, L., Syvitski, J., Constantinescu, S., & Day, J. (2014). Climate change: Protect the world's deltas. *Nature*, *516*(7529), 31-33. https://doi.org/10.1038/516031a

Global Mangrove Alliance. (2022). *The Mangrove Breakthrough*. Global Mangrove Watch. https://www.mangrovealliance.org/wp-content/uploads/2022/11/Mangrove-Breakthrough-_-Leafletv1.2.pdf

Hansen, M. C., Potapov, P. V., Pickens, A. H., Tyukavina, A., Hernandez-Serna, A., Zalles, V., ... & Kommareddy, A. (2022). Global land use extent and dispersion within natural land cover using Landsat data. *Environmental Research Letters*, *17*(3), 034050. https://doi.org/10.1088/1748-9326/ac46ec

IUCN. (2022). *Restoration Barometer 2022 Report.* IUCN, Gland, Switzerland. https://restorationbarometer.org/wp-content/uploads/BE_IUCN_RestorationBarometer_V9.pdf

Grill, G., Lehner, B., Thieme, M., Geenen, B., Tickner, D., Antonelli, F., ... & Zarfl, C. (2019). Mapping the world's free-flowing rivers. *Nature*, *569*(7755), 215-221. https://doi.org/10.1038/s41586-019-1111-9

Gumbricht, T., Roman-Cuesta, R. M., Verchot, L., Herold, M., Wittmann, F., Householder, E., ... & Murdiyarso, D. (2017). An expert system model for mapping tropical wetlands and peatlands reveals South America as the largest contributor. *Global change biology*, *23*(9), 3581-3599. https://doi.org/10.1111/gcb.13689

Gumbricht, T., Román-Cuesta, R. M., Verchot, L. V., Herold, M., Wittmann, F., Householder, E., ... & Salim, M. A. (2017). *Tropical and subtropical wetlands distribution*. Center for International Forestry Research (CIFOR), V7. https://doi.org/10.17528/CIFOR/DATA.00058

Hansen, M. C., Potapov, P. V., Pickens, A. H., Tyukavina, A., Hernandez-Serna, A., Zalles, V., ... & Kommareddy, A. (2022). Global land use extent and dispersion within natural land cover using Landsat data. *Environmental Research Letters*, *17*(3), 034050. https://doi.org/10.1088/1748-9326/ac46ec

Hastie, A., Householder, J. E., Honorio Coronado, E. N., Hidalgo Pizango, C. G., Herrera, R., Lähteenoja, O., ... & Lawson, I. T. (2024). A new data-driven map predicts substantial undocumented peatland areas in Amazonia. *Environmental Research Letters*, *19*(9), 094019. https://doi.org/10.1088/1748-9326/ad677b

Higgs, E. (1994). Expanding the scope of restoration ecology. *Restoration Ecology*, *2*(3), 137-146. https://doi.org/10.1111/j.1526-100X.1994.tb00060.x

Hu, S., Niu, Z., Chen, Y., Li, L., & Zhang, H. (2017). Global wetlands: Potential distribution, wetland loss, and status. *Science of the total environment*, *586*, 319-327. https://doi.org/10.1016/j.scitotenv.2017.02.001

Ibáñez, C., Sharpe, P. J., Day, J. W., Day, J. N., & Prat, N. (2010). Vertical accretion and relative sea level rise in the Ebro Delta wetlands (Catalonia, Spain). *Wetlands*, *30*, 979-988. https://doi.org/10.1007/s13157-010-0092-0

IPBES (2019). *Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. Brondizio, E., Diaz, S., Settele, J., Ngo, H. T. (eds). Bonn, Germany: IPBES secretariat. https://doi.org/10.5281/zenodo.6417333.

International Coral Reef Initiative (ICRI). (2021). *Coral reef restoration guidelines*. Compiled by Thomas Dallison with support from the Australian government. https://icriforum.org/coralrestoration/

IUCN & WCPA. (2024). *Selection of restoration guidelines (of relevance to protected areas).* Compiled by Stephanie Mansourian (with input from TF members). https://iucn.org/sites/default/files/2024-03/selection-of-restoration-guidelines-of-relevance-to-protected-areas.pdf

IUCN. (2025). *The IUCN Red List of Threatened Species*. Version 2025-1. https://www.iucnredlist.org

Junk, W. J. (2024). World wetlands classification: a new hierarchic hydro-ecological approach. *Wetlands Ecology and Management*, *32*(6), 975-1001. https://doi.org/10.1007/s11273-024-10010-7

Khalil, S. M., Freeman, A. M., & Raynie, R. C. (2018). Sediment management for sustainable ecosystem restoration of coastal Louisiana. *Shore & Beach*, *86*(1), 17-27. https://www.researchgate.net/profile/Syed-Khalil-3/publication/323428284_Sediment_management_for_sustainable_ecosystem_restoration_of_coastal_Louisiana/links/5a959542aca2721405693ab0/Sediment-management-for-sustainable-ecosystem-restoration-of-coastal-Louisiana.pdf

Leal, M., & Spalding, M. D. (eds.) (2022). *The State of the World's Mangroves 2022*. Global Mangrove Alliance. https://www.mangrovealliance.org/wp-content/uploads/2022/09/The-State-of-the-Worlds-Mangroves-Report_2022.pdf

Lehner, B., Anand, M., Fluet-Chouinard, E., Tan, F., Aires, F., Allen, G. H., ... & Thieme, M. (2024). Mapping the world's inland surface waters: An update to the Global Lakes and Wetlands Database (GLWD v2). *Earth System Science Data Discussions*, *2024*, 1-49. https://doi.org/10.5194/essd-2024-204

Lehner, B., & Döll, P. (2004). Development and validation of a global database of lakes, reservoirs and wetlands. *Journal of hydrology*, *296*(1-4), 1-22. https://doi.org/10.1016/j.jhydrol.2004.03.028

Lyons, M. B., Murray, N. J., Kennedy, E. V., Kovacs, E. M., Castro-Sanguino, C., Phinn, S. R., ... & Roelfsema, C. M. (2024). New global area estimates for coral reefs from high-resolution mapping. *Cell Reports Sustainability*, *1*(2). https://doi.org/10.1016/j.crsus.2024.100015

Marine Conservation Institute. (2019). *Status Watch: How Well Are Coral Reefs Protected Around the World?* https://marine-conservation.org/on-the-tide/how-well-are-coral-reefs-protected/#:~:text=Globally%2C%20coral%20reefs%20cover%20a,(Figures%201%20and%202)

Marine Conservation Institute. (2024). *Marine Protection Atlas (MPAtlas).* https://mpatlas.org/

Martin, D. M. (2017). Ecological restoration should be redefined for the twenty-first century. *Restoration Ecology*, *25*(5), 668-673. https://doi.org/10.1111/rec.12554

Mora-Soto, A., Palacios, M., Macaya, E. C., Gómez, I., Huovinen, P., Pérez-Matus, A., ... & Macias-Fauria, M. (2020). A high-resolution global map of giant kelp (Macrocystis pyrifera) forests and intertidal green algae (Ulvophyceae) with Sentinel-2 imagery. *Remote Sensing*, *12*(4), 694. https://doi.org/10.3390/rs12040694

Moreno-Mateos, D., Power, M. E., Comín, F. A., & Yockteng, R. (2012). Structural and functional loss in restored wetland ecosystems. *PLoS biology*, *10*(1), e1001247. https://doi.org/10.1371/journal.pbio.1001247

Murray, N. J., Phinn, S. R., DeWitt, M., Ferrari, R., Johnston, R., Lyons, M. B., ... & Fuller, R. A. (2019). The global distribution and trajectory of tidal flats. *Nature*, *565*(7738), 222-225. https://doi.org/10.1038/s41586-018-0805-8

Ramsar Sites Information Service. (2025). *Convention on Wetlands*, Version 2.2. Information sourced from Contracting Parties to the Convention. https://rsis.ramsar.org/

Reis, V., Hermoso, V., Hamilton, S. K., Ward, D., Fluet-Chouinard, E., Lehner, B., & Linke, S. (2017). A global assessment of inland wetland conservation status. *Bioscience*, *67*(6), 523-533. https://doi.org/10.1093/biosci/bix045

Sadat-Noori, M., Rankin, C., Rayner, D., Heimhuber, V., Gaston, T., Drummond, C., ... & Glamore, W. (2021). Coastal wetlands can be saved from sea level rise by recreating past tidal regimes. *Scientific reports*, *11*(1), 1196. https://doi.org/10.1038/s41598-021-80977-3

Sayer, C. A., Fernando, E., Jimenez, R. R., Macfarlane, N. B., Rapacciuolo, G., Böhm, M., ... & Darwall, W. R. (2025). One-quarter of freshwater fauna threatened with extinction. *Nature*, 1-8. https://doi.org/10.1038/s41586-024-08375-z

Sidik, A. S. (2010). The changes of mangrove ecosystem in Mahakam Delta, Indonesia: A complex socialenvironmental pattern of linkages in resources utilization: Mangrove forest. *Borneo Research Journal*, *4*, 27-46. https://mojes.um.edu.my/index.php/BRJ/article/view/9819/6932

Spalding, M., Kainuma, M., & Collins, L. (2010). *World atlas of mangroves*. Routledge. https://doi.org/10.4324/9781849776608

Steel, E. A., Obiang Ndong, G., Adelola, T., Aggestam, F., Akwany, L., Bezerra, M., … & Vollmer, D. (2025). Enabling consistent reporting and monitoring for freshwater (inland waters) restoration under Target 2 of the Kunming-Montreal Global Biodiversity Framework. FAO, Rome, Italy. https://doi.org/10.4060/cd5046en

Strassburg, B. B., Iribarrem, A., Beyer, H. L., Cordeiro, C. L., Crouzeilles, R., Jakovac, C. C., ... & Visconti, P. (2020). Global priority areas for ecosystem restoration. *Nature*, *586*(7831), 724-729. https://doi.org/10.1038/s41586-020-2784-9

Triyanti, A., Bavinck, M., Gupta, J., & Marfai, M. A. (2017). Social capital, interactive governance and coastal protection: The effectiveness of mangrove ecosystem-based strategies in promoting inclusive development in Demak, Indonesia. *Ocean & Coastal Management*, *150*, 3-11. https://doi.org/10.1016/j.ocecoaman.2017.10.017

United Nations Environment Programme (UNEP) (2022). *Global Peatlands Assessment: The State of the World's Peatlands - Evidence for Action toward the Conservation, Restoration, and Sustainable Management of Peatlands*. https://doi.org/10.59117/20.500.11822/41222

UNEP (2022). *Global Peatlands Assessment – The State of the World's Peatlands: Evidence for action toward the conservation, restoration, and sustainable management of peatlands*. Main Report. Global Peatlands Initiative. United Nations Environment Programme, Nairobi, Kenya. https://doi.org/10.59117/20.500.11822/41222

UNEP & FAO. (2023). *Action Plan for the UN Decade on Ecosystem Restoration 2021-2030*, Version April 2023, UN Decade on Ecosystem Restoration. https://wedocs.unep.org/bitstream/handle/20.500.11822/42095/UNDecade_ActionPlan.pdf?sequence=3&isAllowed=y

UNEP-WCMC, WorldFish Centre, WRI, & TNC. (2021). *Global distribution of coral reefs, compiled from multiple sources including the Millennium Coral Reef Mapping Project*. Version 4.1, updated by UNEP-WCMC. UN Environment Programme World Conservation Monitoring Centre, Cambridge, UK. https://doi.org/10.34892/t2wk-5t34

United Nations Convention on Biological Diversity (2016). *Decision CBD/COP/DEC/XIII/31 Key scientific and technical needs related to the implementation of the Strategic Plan for Biodiversity 2011-2020 and related research*. https://www.cbd.int/doc/decisions/cop-13/cop-13-dec-31-en.pdf

Waycott, M., Duarte, C. M., Carruthers, T. J., Orth, R. J., Dennison, W. C., Olyarnik, S., ... & Williams, S. L. (2009). Accelerating loss of seagrasses across the globe threatens coastal ecosystems. *Proceedings of the National Academy of Sciences*, *106*(30), 12377-12381. https://doi.org/10.1073/pnas.0905620106

Worthington, T. A., Spalding, M., Landis, E., Maxwell, T. L., Navarro, A., Smart, L. S., & Murray, N. J. (2024). The distribution of global tidal marshes from earth observation data. *Global Ecology and Biogeography*, *33*(8), e13852. https://doi.org/10.1111/geb.13852

Yi, Q., Huixin, G., Yaomin, Z., Jinlian, S., Xingyu, Z., Huize, Y., ... & Xiankai, H. (2024). Global conservation priorities for wetlands and setting post-2025 targets. *Communications Earth & Environment*, *5*(1), 4. https://doi.org/10.1038/s43247-023-01195-5

Zhang, X., Liu, L., Zhao, T., Chen, X., Lin, S., Wang, J., ... & Liu, W. (2022). GWL_FCS30: global 30 m wetland map with fine classification system using multi-sourced and time-series remote sensing imagery in 2020. *Earth System Science Data Discussions*, *2022*, 1-31. https://doi.org/10.5194/essd-15-265-2023.

Zhang, X., Liu, L., Zhao, T., Wang, J., Liu, W., & Chen, X. (2024). Global annual wetland dataset at 30 m with a fine classification system from 2000 to 2022. *Scientific Data*, *11*(1), 310. https://doi.org/10.1038/s41597-024-03143-0

zu Ermgassen, P., Hancock, B., DeAngelis, B., Greene, J., Schuster, E., Spalding, M., & Brumbaugh, R. (2016). *Setting objectives for oyster habitat restoration using ecosystem services: A manager's guide*. The Nature Conservancy, Arlington, VA. https://oceanwealth.org/wp-content/uploads/2016/06/Setting-Objectives-for-Oyster-Habitat-Restoration-Using-Ecosystem-Service.pdf

REFERENCES FROM TABLES

Alliance Biodiversity International. (2025). *4 per 1000: Soils for food security and climate*. The "4 per 1000" Initiative. https://4p1000.org/?lang=en

Barbarossa, V., Bosmans, J., Wanders, N., King, H., Bierkens, M. F., Huijbregts, M. A., & Schipper, A. M. (2021). Threats of global warming to the world's freshwater fishes. *Nature communications*, *12*(1), 1701. https://doi.org/10.1038/s41467-021-21655-w

Berger, J. J. (1987). *Restoring the earth. How Americans are working to renew our damaged environment*. Doubleday, New York. https://agris.fao.org/search/en/providers/122621/records/647396aa3ed73003714cdf66

Borneo Nature Foundation & UNEP. (2025). *Borneo Nature Foundation: Community-led restoration of Borneo's tropical peat-swamp forests*. Borneo Nature Foundation, Central Kalimantan, Indonesia. https://hub.decadeonrestoration.org/initiatives/borneo-nature-foundation-community-led-restoration-borneos-tropical-peat-swamp-forests

Bosmans, J., Wanders, N., Bierkens, M. F., Huijbregts, M. A., Schipper, A. M., & Barbarossa, V. (2022). FutureStreams, a global dataset of future streamflow and water temperature. *Scientific Data*, *9*(1), 307. https://doi.org/10.1038/s41597-022-01410-6

CBD. (2016). Decision XIII/5. Ecosystem restoration: Short-term action plan. 13th Conference of the Parties to the Convention on Biological Diversity, Cancun, Mexico. https://www.cbd.int/doc/decisions/cop-13/cop-13-dec-05-en.pdf

Colorado Wetland Information Center. (2021). *Watershed Toolbox*. Colorado Wetland Information Center, Colorado Natural Heritage Program, Colorado State University, Ft. Collins, Colorado. https://cnhp.colostate.edu/cwic/tools/toolbox/

Copernicus Land Monitoring Service. (2019). *Land Cover 2019 (raster 100m), global, yearly – Version 3*. Dataset. Global Dynamic Land Cover. https://land.copernicus.eu/en/products/global-dynamic-land-cover/copernicus-global-land-service-land-cover-100m-collection-3-epoch-2019-globe

Davis, M. A., & Slobodkin, L. B. (2004). The science and values of restoration ecology. *Restoration Ecology*, *12*(1). Link here.

Dronova, I., Kislik, C., Dinh, Z., & Kelly, M. (2021). A review of unoccupied aerial vehicle use in wetland applications: Emerging opportunities in approach, technology, and data. *Drones*, *5*(2), 45.https://doi.org/10.3390/drones5020045

European Centre for River Restoration. (2025). *Platform for sharing knowledge on river restoration in Europe*. RESTORE Partnership & European Centre for River Restoration, European Union. https://www.ecrr.org/

FAO and UNEP. (2022). *Global indicators for monitoring ecosystem restoration – A contribution to the UN Decade on Ecosystem Restoration*. FAO, Rome, Italy. https://doi.org/10.4060/cb9982en

Global Peatlands Initiative. (2025). *A partnership to save peatlands as the world's largest terrestrial organic carbon stock.* UNFCCC COP 2016, Marrakech, Morocco. https://globalpeatlands.org/

Habersack, H. (2025). *Danube4all: Restoring the Danube River basin for ecosystem and human benefits*. Danube Basin Restoration Action Plan, Boku University, Vienna, Austria. https://danube4all.eu/

Hansen, M. C., Potapov, P. V., Moore, R., Hancher, M., Turubanova, S. A., Tyukavina, A., ... & Townshend, J. R. (2013). High-resolution global maps of 21st-century forest cover change. *science*, *342*(6160), 850-853. https://doi.org/10.1126/science.1244693

IPCC. (2018). *Summary for policymakers*. Special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. Intergovernmental Pannel of Climate Change, Cambridge, UK. https://www.ipcc.ch/site/assets/uploads/sites/2/2022/06/SPM_version_report_LR.pdf

IUCN Bonn Challenge Secretariat. (2025). *The Bonn Challenge: A global effort to restore degraded and deforested lands*. https://www.bonnchallenge.org/ \

Kelp Forest Alliance. (2025). *Kelp Forest Alliance Database*. University of New South Wales, Sydney, Australia. https://kelpforestalliance.com/knowledge-hub

Khan, Z., Thompson, I., Vernon, C. R., Graham, N. T., Wild, T. B., & Chen, M. (2023). Global monthly sectoral water use for 2010–2100 at 0.5 resolution across alternative futures. *Scientific data*, *10*(1), 201. https://doi.org/10.1038/s41597-023-02086-2

Langhorst, T., & Pavelsky, T. (2023). Global observations of riverbank erosion and accretion from Landsat imagery. *Journal of Geophysical Research: Earth Surface*, *128*(2), e2022JF006774. https://doi.org/10.1029/2022JF006774

Lehner, B., Messager, M. L., Korver, M. C., & Linke, S. (2022). Global hydro-environmental lake characteristics at high spatial resolution. *Scientific Data*, *9*(1), 351. https://doi.org/10.1038/s41597-022-01425-z

Linke, S., Lehner, B., Ouellet Dallaire, C., Ariwi, J., Grill, G., Anand, M., ... & Thieme, M. (2019). Global hydro-environmental sub-basin and river reach characteristics at high spatial resolution. *Scientific data*, *6*(1), 283. https://doi.org/10.1038/s41597-019-0300-6

Mapping Ocean Wealth. (2025). *Mapping portal*. The Nature Conservancy & The World Bank. https://maps.oceanwealth.org/#/portal

Müller, G., Middelburg, J. J., & Sluijs, A. (2021). Introducing GloRiSe–a global database on river sediment composition. *Earth System Science Data*, *13*(7), 3565-3575. https://doi.org/10.5194/essd-13-3565-2021

Mueller, N. D., Gerber, J. S., Johnston, M., Ray, D. K., Ramankutty, N., & Foley, J. A. (2012). Closing yield gaps through nutrient and water management. *Nature*, *490*(7419), 254-257. https://doi.org/10.1038/nature11420

Regreening Africa. (2025). *Regreening Africa: Restoring degraded lands across Africa*. World Agroforestry Center, Nairobi, Kenya. https://regreeningafrica.org/

Restor. (2025). *Restor: Connecting People to Restore the Planet*. Restor Foundation. https://restor.eco/?lat=26&lng=14.23&zoom=3

SEPAL Development Team. (2025). *System for Earth Observation Data Access, Processing and Analysis for Land Monitoring (SEPAL)*. Food and Agriculture Organization of the United Nations, Rome, Italy. https://sepal.io/

SER. (2004). *SER International Primer on Ecological Restoration.* Society for Ecological Restoration, Washington, D.C. https://cdn.ymaws.com/www.ser.org/resource/resmgr/custompages/publications/ser_publications/Dev_and_Mng_Eco_Rest_Proj.pdf

The Global Wetlands Project (2025). *Global Coastal Wetlands Index App*. Griffith University, Queensland, Australia. https://glowdex.wetlands.app/

The Nature Conservancy (TNC). (2009). *Global database of freshwater invasive species*. Unpublished. https://databasin.org/datasets/11a22d0ce62142258baaa1cbaf520fb2/

UNEP-WCMC. (2025). *Map of Protected Areas and OECMs, April 2025*. Protected Planet Initiative. https://www.protectedplanet.net/en/monthly-release-news/april-2025-update-of-the-wdpa-wd-oecm-and-gd-pame

UNEP & FAO. (2025). *World Restoration Flagships: UN recognition of flagship initiatives for ecosystem restoration*. Retrieved from https://www.decadeonrestoration.org/world-restoration-flagships

United Nations Convention to Combat Desertification. (2007). *Great Green Wall Initiative: Africa's flagship initiative to combat land degradation, desertification, and drought*. https://www.unccd.int/our-work/ggwi

Wang, X., & Feng, L. (2022). Global annual lake ice phenological dataset 1861-2099. *Figshare*. Dataset. https://doi.org/10.6084/m9.figshare.19424801.v1

World Resources Institute (WRI). (2023). *Aqueduct Water Risk Atlas 4.0*. Washington, D.C. https://www.wri.org/applications/aqueduct/water-risk-atlas/

World Resources Institute (WRI). (2025). *Coral Reefs Dashboard*. Resource Watch Dashboards, Washington, D.C. https://resourcewatch.org/dashboards/coral-reefs?ap3c=IGd7Fa7muHfEG9MEAGd7Fa4q_A76bXk0vRf9jFMjQZYeP6IC9g

SUPPLEMENTAL INFORMATION

Supplemental Tables

Table S1: Definitions of ecological restoration found in the literature (bolding added for emphasis).

Definitions of ecological restoration	**Source**
*"a process in which a damaged resource or region is **renewed**. Biologically. Structurally. Functionally."*	Berger, 1987
*"the **total set of ideas and practices** (social, scientific, economic, political) involved in the restoration of ecosystems."*	Higgs, 1994
*"the process of **assisting** the recovery of an ecosystem that has been degraded, damaged, or destroyed"*	SER, 2004
*"the process of restoring one or more **valued** processes or attributes of a landscape."*	David & Slobodkin, 2004
*"the process of **managing or assisting** the recovery of an ecosystem that has been degraded, damaged or destroyed as a means of sustaining ecosystem resilience and conserving biodiversity."*	CBD, 2016
*"the process of assisting the recovery of a degraded, damaged, or destroyed ecosystem to reflect **values** regarded as inherent in the ecosystem and to provide goods and services that people value."*	Martin, 2017
*"activities that promote a **return to previous conditions** — as well as activities that improve the functioning of a wetland without necessarily seeking to return it to its pre-disturbance condition"*	Convention on Wetlands, 2021
*"the process of **halting and reversing degradation**, resulting in improved ecosystem services and recovered biodiversity"*	UNEP & FAO, 2023

Table S2: STRP extent recommendations on area by wetland type.

Wetland type	**Area (ha)**				**Notes**
	Consultant Review	*Davidson & Finlayson, 2019*	*Lehner et al., 2024*	*STRP review figures*	
Salt marshes	6,390,500	5,500,000	5,920,000	5,288,000	Worthington et al., 2024
Coral reefs	34,835,700	28,400,000		34,835,700	Lyons et al., 2024
Kelp forests	261,644,385			1,708,800	Mora-Soto et al., 2020
Mangroves	15,219,450	13,800,000	15,080,000	15,112,000	Bunting et al., 2022
Seagrass	286,351,400	78,800,000		35,881,400	Blume et al., 2023
Estuaries	33,720,240	66,000,000	27,870,000	27,870,000	Lehner et al., 2024
Lakes	334,832,100	371,600,000	271,530,000	271,530,000	Lehner et al., 2024
Inland marshes, swamps	280,538,928	253,000,000	461,650,000	461,650,000	Lehner et al., 2024 (mid-point of range)
Peatlands	664,022,600	311,800,000	517,490,000	500,000,000	UNEP, 2022
Rivers	44,362,300	64,300,000	58,930,000	58,930,000	Lehner et al., 2024

Total area (million ha / million km²)	**1.96** / 19.6	**1.19** / 11.9	**1.36** / 13.6	**1.41** / 14.1	

Table S3: Summary information for countries, including reporting to the Convention on Wetlands and FERM, the number of Wetlands of International Importance, the FERM area under restoration, the Restoration Barometer area under restoration, and the number of sites and organizations in RESTOR.

Country name	Reported to Ramsar?	Wetlands of International Importance (n)	Reported in FERM?	FERM (ha under restoration)	Restoration Barometer (ha under restoration)	RESTOR sites (n)	RESTOR organizations (n)
Afghanistan	N		Y	12000		14	9
Albania	Y	4	N			0	3
Algeria	Y	50	N			5	11
American Samoa	N		N			0	2
Andorra	Y	3	N			0	0
Angola	N	1	N			31	8
Anguilla	N		N			0	0
Antigua and Barbuda	Y	1	Y			0	0
Argentina	Y	24	Y	5000		149	61
Armenia	Y	3	N			11	3
Aruba	N		N			1	1
Australia	Y	67	Y			3949	60
Austria	Y	24	N			26	5
Azerbaijan	Y	2	N			1	1
Bahamas	N	1	N			3	2
Bahrain	Y	2	N			5	1
Bangladesh	Y	2	Y	120150	198332	123	77
Barbados	N	1	N			1	0
Belarus	N	26	N			0	0
Belgium	Y	9	N			39	14
Belize	N	2	N			66	3
Benin	Y	4	N			13	20
Bermuda	N		N			0	1
Bhutan	Y	3	N			5	3
Bolivia	Y	11	N			55	21
Bosnia and Herzegovina	Y	3	N			3	0
Botswana	Y	1	N			6	6
Brazil	Y	27	Y	153.14		8239	155
Brunei Darussalam	N		N			0	0
Bulgaria	Y	11	N			7	4
Burkina Faso	Y	25	N			148	8
Burundi	N	4	N			22	13
Cambodia	Y	5	N			115	15

Cameroon	Y	7	Y			143	64
Canada	Y	37	Y	3000		173	52
Cape Verde	N	4	N			2	2
Cayman Islands	N		N			1	1
Central African Republic	Y	2	N			3	2
Chad	Y	6	N			6	6
Chile	N	16	N			1421	13
China	Y	82	Y	2000022		70	15
Colombia	Y	11	Y	30	559509	1391	104
Comoros	Y	3	Y			2	1
Cook Islands	N		N			0	0
Costa Rica	Y	12	Y	200	498279	2815	52
Cote de Ivore	N	6	N			141	44
Croatia	Y	5	N			6	5
Cuba	N	6	N			2	0
Curacao	N		N			0	0
Cyprus	Y	1	N			1	0
Czechia	N	14	N			28	5
Dem. Rep. Korea	N	2	Y			0	0
Democratic Republic of the Congo	N	4	N			395	77
Denmark	Y	43	Y			102	7
Djibouti	N	1	N			0	0
Dominica	N		N			1	1
Dominican Republic	Y	6	N			25	5
Ecuador	Y	19	Y			698	51
Egypt	N	4	Y	0		6	14
El Salvador	Y	8	N		278908	7	4
Equatorial Guinea	Y	3	N			0	0
Eritrea	N		Y			4	0
Estonia	Y	17	N			19	1
Ethiopia	N		N			4571	61
Federated States of Micronesia	N		N			0	0
Fiji	N	2	N			5	2
Finland	Y	49	Y			2	7
France	Y	55	Y			268	28
French Polynesia	N		N			0	0
Gabon	N	9	N			5	5
Gambia	N	3	N			12	7
Georgia	Y	4	N			6	5
Germany	Y	35	N			190	66
Ghana	Y	6	N		628338	70	77

Greece	N	10	N			71	9
Greenland	N		N			1	0
Grenada	N	1	N			0	0
Guam	N		N			10	1
Guatemala	Y	7	N		379192	54	15
Guinea	Y	16	N			859	7
Guinea-Bissau	N	4	N			0	3
Guyana	N		N			2	0
Haiti	N		N			28	7
Honduras	Y	12	N			261	6
Hong Kong	N		N			5	6
Hungary	Y	29	N			27	4
Iceland	N	6	N			4	1
India	Y	89	Y	76000		1740	267
Indonesia	Y	8	Y	235		1417	160
Iran	Y	27	N			1	1
Iraq	Y	4	Y			35	8
Ireland	Y	45	N			122	11
Israel	N	2	Y			10	2
Italy	Y	57	N			514	25
Jamaica	Y	4	N			4	1
Japan	Y	53	N			3	3
Jordan	N	2	Y	1200		11	10
Kazakhstan	N	10	Y	7000000	575185	24	3
Kenya	Y	6	Y	29	2608125	1245	339
Kiribati	N	1	N			1	0
Kosovo	N		N				
Kuwait	Y	1	N			0	0
Kyrgyzstan	N	3	N		136249	2	2
Lao PDR	N	2	N			50	7
Latvia	Y	6	N			1	1
Lebanon	Y	4	Y			24	13
Lesotho	N	1	N			3	4
Liberia	Y	5	N			10	18
Libya	N	2	N			1	1
Liechtenstein	Y	1	N			0	1
Lithuania	Y	7	N			5	0
Luxembourg	N	2	N			1	2
North Macedonia	Y	3	N			1	3
Madagascar	Y	21	N			1064	35
Malawi	Y	2	N		1746959	57	79

Malaysia	Y	7	N			76	20
Maldives	N		N			3	1
Mali	Y	4	N			8	5
Malta	Y	2	N			5	0
Marshall Islands	Y	2	N			0	0
Mauritania	N	4	Y	240000		3	0
Mauritius	N	3	N			4	2
Mexico	Y	144	Y	2	5219984	2706	79
Moldova	N	3	N			1	2
Monaco	N	1	N			0	0
Mongolia	N	11	N			15	9
Montenegro	Y	3	N			1	1
Montserrat	N		N			0	0
Morocco	Y	38	Y	64000		18	8
Mozambique	Y	2	N		17526	116	22
Myanmar	N	7	N			27	1
Namibia	N	5	N			15	10
Nauru	N		N			0	0
Nepal	N	10	Y	67000		95	64
Netherlands	Y	58	Y			188	45
New Caledonia	N		N			0	0
New Zealand	Y	7	N			59	16
Nicaragua	Y	9	N			14	4
Niger	Y	14	N			4	5
Nigeria	Y	13	N			89	224
Northern Cyprus	N		N			1	0
Northern Mariana Islands	N		N			0	2
Norway	Y	63	N			5	6
Oman	Y	3	N			1	1
Pakistan	Y	19	Y	1060000		31	69
Palau	N	1	N			0	0
Palestine	N		N			0	3
Panama	Y	5	N			57	8
Papua New Guinea	N	2	N			7	2
Paraguay	Y	6	Y			23	9
Peru	Y	14	N		90552	403	66
Philippines	Y	10	Y	10000		127	50
Poland	Y	19	N			12	6
Portugal	Y	31	N			1457	44
Puerto Rico	N		N			6	3
Qatar	N		N			0	0

Republic of Congo	N	14	N			5	6
Republic of Korea	N	26	N			33	2
Romania	Y	20	N			132	9
Russian Federation	N	35	N			96	3
Rwanda	Y	1	N		597718	20	29
Saint Lucia	N	2	Y			0	0
Saint Vincent and the Grenadines	N		N			0	0
Samoa	N	3	N			0	0
Sao Tome & Principe	N	1	Y	6000		2	0
Saudi Arabia	N		N			43	1
Senegal	Y	9	N			60	16
Serbia	Y	11	N			57	1
Seychelles	Y	3	N			1	1
Sierra Leone	N	1	N			108	27
Singapore	N		N			1	5
Sint Maarten	N		N			0	0
Slovakia	Y	14	N			279	3
Slovenia	Y	3	N			8	1
Solomon Islands	N		N			1	2
Somalia	N		N			5	15
South Africa	Y	31	Y	232		287	85
South Sudan	N	1	N			6	9
Spain	Y	76	Y	8000		784	47
Sri Lanka	Y	6	Y	500	5241	54	34
Sudan	Y	4	Y			4	3
Suriname	Y	1	N			1	1
Swaziland	N	3	N			0	1
Sweden	Y	68	N			32	5
Switzerland	Y	11	N			54423	69
Syria	N	1	N			3	1
Taiwan	N		Y			1	0
Tajikistan	Y	5	N		90074	0	2
Thailand	Y	15	Y			127	23
Timor-Leste	N		N			6	3
Togo	N	4	N			8	10
Tonga	N		N			0	0
Trinidad and Tobago	Y	3	N			1	2
Tunisia	N	42	Y			7	7
Turkey	Y	14	N			53	12
Turkmenistan	N	1	N			1	0
Turks & Caicos Islands	N		N			0	0

Tuvalu	N		N			0	0
Uganda	Y	12	N		650295	420	152
Ukraine	Y	50	N			11	8
United Arab Emirates	Y	10	Y	8000		6	8
United Kingdom	Y	176	Y	371		1886	183
United Republic of Tanzania	N	4	N			430	142
United States	Y	41	Y	39038.03		7110	220
Uruguay	Y	3	N			9	3
Uzbekistan	Y	5	N			2	2
Vanuatu	N	1	Y			0	0
Venezuela	Y	5	Y	20		13	6
Vietnam	Y	9	Y	38.8		43	13
Western Sahara	N		N			1	0
Yemen	N	1	N			6	13
Zambia	N	8	N			109	88
Zimbabwe	N	7	N			51	36

Table S4: Summary of information extracted from national reporting to the Convention on Wetlands.

Section	**Description**	**Metric**
2A	What have been the five main achievements of the implementation of the Convention since COP14?	Free response
2B	What have been the five main challenges in implementing the Convention since COP14?	Free response
2C	Please outline five priorities for implementing the Convention in your country during the coming triennium (2026-2028).	Free response
3 - 8.6	Total area in square kilometres (Km^2) by type of wetland (inland, human-made, marine/coastal)	Total area of wetland extent (Km^2)
3 - 8.7	How has the ecological character 1 of wetlands in your country, overall, changed since COP14?	N=Status deteriorated; O=No change; P=Status improved
3 - 8.8	On a scale of 1-5 rate the change in the ecological character of wetlands in your country, overall, since last COP?	N=Status deteriorated; O=No change; P=Status improved
3 - 8.9	What are your main needs in developing or updating an NWI to support SDG Indicator 6.6.1 reporting for tracking global wetland status and trends?	a) Access to data and data acquisition standards, b) Wetland delineation methods and approaches, c) Habitat classifications, d) Standardization in data interpretation methods, e) Regulatory framework and governance structure, f) Resources, g) Relevant skills, h) Data collection and mapping, i) Collaboration, j) Others
3 - 8.10	Please select the main needs of your country in using NWI results to implement COP mandates.	a) Resources, b) Relevant skills, c) Data systems and management, d) Application of NWI information for decision making (climate, biodiversity and sectoral planning/ reporting), e) Regulatory framework and

		governance structure, f) Data interpretation and communication, g) Collaboration, h) Others
3 - 12.1	Have national wetland restoration targets been established?	A=Yes; B=No; C= Partially; D=Planned; X=Unknown; Y=Not relevant
3 - 12.2	Have priority sites for wetland restoration been identified?	A=Yes; B=No; C= Partially; D=Planned; X=Unknown; Y=Not relevant
3 - 12.3	Since COP14 have wetland restoration/ rehabilitation programmes, plans or projects been implemented?	Square kilometers (Km^2) planned, under restoration, and total restored

Table S5: Summary of other case studies highlighting local wetland restoration efforts by desired outcome type.

Location	**Ecosystem Function**	**Connectivity**	**Biodiversity**	**Integrity**
1. Yellow River (China)	Afforestation and soil erosion control enhance services	Loess Plateau connects ecosystems	Biodiversity hotspots in delta regions	Mitigation of ecological risks in mining areas
2. Victoria (Australia)	Coastal wetland restoration, carbon sequestration	Improved by addressing land tenure issues	Focus on offsetting biodiversity loss	Legal frameworks for sustainable practices
3. Everglades (USA)	Hydrological restoration, water purification	Access (trails) modification restores flows	Invasive species control supports native species	Phosphorus reduction for habitat integrity
4. Nilgiri / Tamil Nadu (India)	Native forest restoration improves local water supply	Traditional knowledge aids connectivity and wildlife corridors	Focus on threats to fauna and endemic species conservation	Invasive species management strengthens ecosystems
5. Victoria Nile Basin (Uganda)	Sustainable fishing practices maintain balance	Protection of water flows aids connectivity	Bird and wildlife habitats preserved	Community engagement ensures resilience

Table S6: Continent summaries of country commitments to wetland restoration site identification for COP 13, COP 14 and the difference between them.

Category	COP 13 (%)	COP 14 (%)	Difference
Africa			
Yes (A)	26%	26%	No change
No (B)	20%	16%	-4%
Planned (D)	12%	13%	+1%
Partially (C)	24%	32%	+8%
Asia			
Yes (A)	44%	63%	+19%
No (B)	30%	8%	-22%
Planned (D)	7%	8%	+1%
Partially (C)	11%	13%	+2%

Europe			
Yes (A)	69%	71%	+2%
No (B)	10%	7%	-3%
Planned (D)	2%	5%	+3%
Partially (C)	14%	12%	-2%
Europe			
Yes (A)	44%	63%	+19%
No (B)	30%	8%	-22%
Planned (D)	7%	8%	+1%
Partially (C)	11%	13%	+2%
North America			
Yes (A)	100%	100%	No change
No (B)	0%	0%	No change
Latin America & Caribbean			
Yes (A)	27%	48%	+21%
No (B)	9%	10%	+1%
Planned (D)	9%	10%	+1%
Partially (C)	45%	24%	-21%
Oceania			
Yes (A)	17%	25%	+8%
No (B)	17%	0%	-17%
Planned (D)	0%	0%	No change
Partially (C)	33%	75%	+42%