






POLICY OPEN ACCESS

From Symbolism to Action: Financing Wetland Protection in a Warming World

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Received: 14 January 2026 | **Revised:** 9 February 2026 | **Accepted:** 6 March 2026

Keywords: wetland conservation | wetland policy | Wetlands Forever Facility | World Wetlands Day

ABSTRACT

February 2, World Wetlands Day, highlights the vital role of wetlands in biodiversity, climate regulation, food systems and human livelihoods. Although they cover a small fraction of Earth's surface, wetlands provide a disproportionate share of ecosystem services and mitigate climate change through carbon sequestration. Yet, over one-third of global wetlands have been lost in recent decades, weakening their ability to buffer climate extremes. Despite advances under frameworks such as the Ramsar Convention, protection remains fragmented and insufficient. We argue that effective conservation requires large-scale financial mechanisms and propose initiating discussions toward a Wetlands Forever Facility to enable integrated, equitable investments.

February 2 marks World Wetlands Day, a date on which hundreds of countries across all continents recognize the importance of wetlands for life on Earth, including human societies. Estimates indicate that 126,000 freshwater species represent 9.5% of the total number of animal species recognized globally (Balian et al. 2008). Wetlands are estimated to cover at least 18.2 million km², equivalent to 13.4% of total global land area (excluding Antarctica) (Lehner et al. 2025). These ecosystems provide groundwater recharge, storage and purification of the planet's freshwater, mitigation of extreme floods and hydrological droughts and support part of global grain, protein and energy production. They also play a crucial role in regulating the Earth's climate. Wetlands are home to hundreds of Indigenous and traditional communities worldwide, contributing to their food and water security, sociocultural identity and livelihoods. The value of ecosystem services provided by wetlands exceeds

that of the world's forests by a factor of 40 (Costanza et al. 2014). Natural wetland ecosystems provide ecosystem values of about Int\$ 47.4 trillion, based on 2011 global monetary value, corresponding to the threefold amount of the United States' gross domestic product in that year (Davidson et al. 2019).

Despite their immense value, wetlands face intense anthropogenic pressures from agricultural expansion, hydropower generation, urbanization, pollution and climate change. Rates of wetland loss are striking. Approximately 35% of the global wetland area was lost between 1970 and 2015 (Darrah et al. 2019), with the remaining showing some degree of threat (Sayer et al. 2025). These impacts not only reduce biodiversity but also undermine ecosystem services essential to human life, particularly the maintenance of a climate suitable for life on the planet. The degradation of wetlands by human activities has reduced

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their capacity to remove atmospheric CO generated by anthropogenic emissions (Moomaw et al. 2018). This loss of function diminishes wetlands' natural ability to mitigate the consequences of current climate change, such as prolonged droughts, heatwaves, hurricanes, flooding, wildfires, crop failures, impacts on human health, biodiversity loss and the erosion of fundamental human rights to exist, to belong and to maintain ancestral cultures.

Currently, more than three billion people worldwide are vulnerable to the impacts of climate instability, and mortality associated with extreme events—particularly floods and droughts that directly affect wetland-dependent landscapes. Economic impacts caused by storms and floods, processes strongly mediated by the loss or alteration of wetlands, are estimated to exceed annually US\$100 billion in recent years (Rogers et al. 2025). For the period 1970–2021, the World Meteorological Organization reports the occurrence of 11,778 disasters attributed to weather-, climate- and water-related extremes, causing globally over two million deaths and economic losses estimated at US\$4.3 trillion (World Meteorological Organization 2023). The magnitude and frequency of extreme floods and droughts—events whose impacts are closely linked to the capacity of wetlands to regulate hydrological flows—are likely to increase with ongoing climate change. In Brazil alone, more than 63,000 extreme events have occurred in the last three decades, and 93% of municipalities have experienced at least one such event. In 2024, a single week-long precipitation event (600mm) in southern Brazil, a region historically shaped by floodplain and wetland systems, displaced more than 600,000 people and generated massive economic losses (Moreira et al. 2025). Under this scenario, water management will be crucial to the increasing risks posed by climate change, where wetlands play a fundamental role. We do not claim that all the climate impacts reported above originate from wetland degradation; however, we assert that degrading wetlands reduces the natural capacity of these ecosystems to absorb atmospheric CO and contribute to climate mitigation. For instance, mangroves, tidal marshes and seagrass meadows—wetland types with exceptionally high capacity to sequester and store atmospheric carbon (blue carbon)—can surpass forests in this function, and their degradation compromises this efficiency (Choudhary et al. 2024).

The benefits that wetlands provide for life on the planet, including human populations, must be preserved, and governments bear the responsibility to do so. One of the most important global steps for wetland protection was in 1971 with agreement to develop the Ramsar Convention on Wetlands. The Convention is an international treaty that outlines principles and provides guidance for national initiatives and cross-country cooperation to safeguard wetlands and promote their wise use, contributing to global sustainable development. Currently, Contracting Parties to the Convention have listed 2524 wetlands of international importance (known as Ramsar Sites) distributed across six regions (Figure 1) and committed to maintaining their ecological character (Convention on Wetlands 2025). Despite this highly regarded initiative, Ramsar Sites cover less than about 14%–17% of the world's wetlands, and many are vulnerable to human activities, as are many of the remaining wetlands (Convention on Wetlands 2025).

Nearly 30 years after the first World Wetlands Day in 1997, there is much to celebrate. Wetlands are now far better mapped and monitored in some world regions (Lehner et al. 2025); national wetlands policies have been prepared (Davidson et al. 2019) and reinstated in some countries (Maltchik et al. 2025); and economic incentives such as payments for ecosystem services, biocredits and blue credits are increasingly in place. We have international congresses, thousands of scientific publications, emerging technologies and nature-based solutions inspired by wetlands, such as sponge cities. Similarly, wetland restoration efforts through rewetting, reconnecting, active revegetation and fencing are continuously increasing because of the increasing awareness that freshwater and coastal wetlands are a comprehensive nature-based solution for the mitigation of the impacts of climate change (Schuster et al. 2024). Despite growing interest in wetland restoration, the evidence on the value it delivers remains uncertain. Comprehensive post-restoration, site-level valuation is critical to substantiate further investments and to improve the credibility of predictive and value transfer approaches in informing policy and management decisions (Browne et al. 2018). In addition, the cost-effectiveness of wetland restoration remains understudied, though it is likely that those measurements are much more expensive than the conservation and/or protection of still functional and mostly undisturbed wetlands.

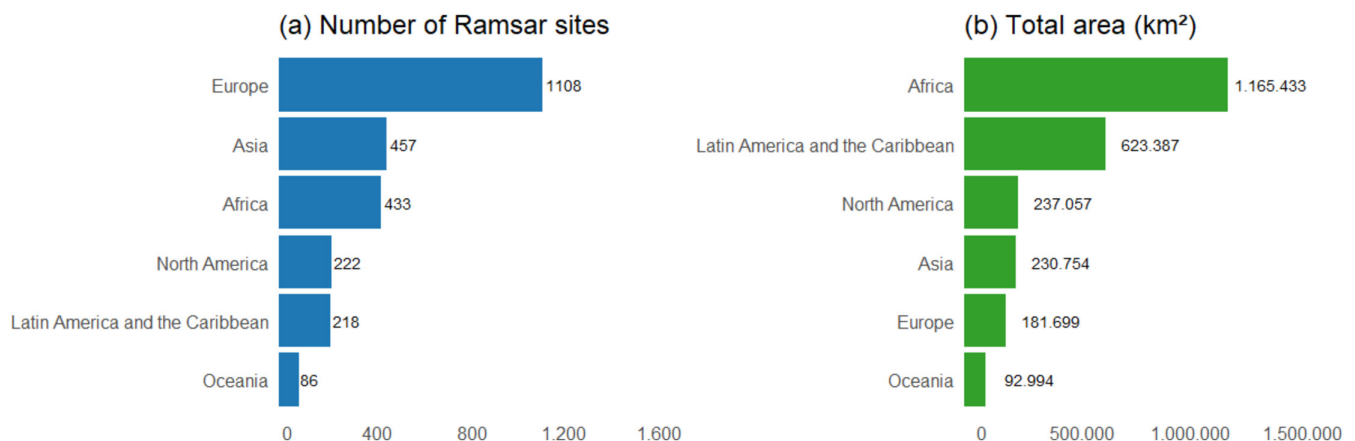


FIGURE 1 | Comparative representation of the number of Ramsar sites (a) and their cumulative area in square kilometres (b) across major world regions.

At the same time, 2 February is also a day for reflection. Despite these advances, there remains a pressing need for more integrated, large-scale actions that align communities, scientists and researchers, policymakers and governments. This includes promoting co-design and co-production of knowledge as part of building transformative futures for wetlands. Actionable and implementation-oriented science offers a promising pathway for large-scale collaboration among scientists, managers and community groups, with the potential to reduce disasters and address other major societal challenges.

However, financial support remains a key bottleneck for truly disruptive transformation, capable of fostering integrated, large-scale and tele-coupled initiatives that reconcile wetland conservation, sustainable economic value chains, justice and equity. Inspired by the recently launched Tropical Forests Forever Facility (TFFF), during COP30, which took place in November 2025 in Brazil, with the endorsement of 63 countries at this moment, and regional initiatives such as the Pantanal Fund (supported by the State of Mato Grosso do Sul, Brazil), we suggest that World Wetlands Day could serve as a catalyst for a broader conversation on long-term financing for wetlands. Initiating discussions on a Wetlands Forever Facility (WFF) may help bridge science, policy and practice, enabling integrated, large-scale and equitable strategies to halt wetland loss and degradation and support sustainable wetland-based economies.

Although World Wetlands Day (2 February) represents a symbolic milestone and an opportunity for consideration of the importance of wetlands at the planetary scale, it must be acknowledged that its celebration has not yet generated the necessary awareness among decision-makers, nor led to effective protection actions for most of the world's wetlands. The lack of a genuine and sustained commitment is evident, and the destruction of these ecosystems continues. The time has come to move beyond symbolism and establish concrete and urgent measures to minimize impacts and safeguard future quality of life. A Wetlands Forever Facility has the potential to create the impetus to transform wetland management, including restoration, and ensure that World Wetlands Day is more than a symbolic celebration of the creation of the Wetlands Convention. In 1971, the creation of a Wetlands Convention was a transformational step—a Wetlands Forever Facility is another and is needed.

In sum, the multiple values of wetlands, ecological, social, cultural, climatic and economic, stand in stark contrast to the limited and fragmented investments currently dedicated to ensuring their long-term maintenance and integrity. Despite generating immense monetary value and underpinning human well-being, climate stability and biodiversity conservation worldwide, wetlands remain systematically undervalued in financial and policy frameworks. This disconnect between value and investment represents one of the central paradoxes of contemporary environmental governance. Addressing it requires moving beyond short-term, project-based funding toward stable, long-term and globally coordinated financial mechanisms. Our central message is therefore clear: The creation of a global financing mechanism, such as a Wetlands Forever Facility, is urgently needed to translate the recognized value of wetlands into sustained action, ensuring their conservation, restoration and equitable management for present and future generations.

Author Contributions

Leonardo Maltchik: conceptualization, writing – original draft, writing – review and editing. **Maria Teresa Fernandez Piedade:** writing – original draft, writing – review and editing. **Jochen Schöngart:** writing – original draft, writing – review and editing. **Cristina Stenert:** writing – original draft, writing – review and editing. **Darold Paul Batzer:** writing – original draft, writing – review and editing. **Florian Wittmann:** writing – original draft, writing – review and editing. **C. Max Finlayson:** writing – original draft, writing – review and editing. **Wolfgang Johannes Junk:** writing – original draft, writing – review and editing. **Nick Davidson:** writing – original draft, writing – review and editing. **João Paulo Ribeiro Capobianco:** writing – original draft, writing – review and editing. **Fabio de Oliveira Roque:** conceptualization, writing – original draft, writing – review and editing.

Acknowledgements

The Article Processing Charge for the publication of this research was funded by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil (CAPES) (ROR identifier: 00x0ma614).

Funding

L.M., F.O.R., C.S., M.T.F.P., W.J.J., F.W. and J.S. acknowledge funding from the National Council for Scientific and Technological Development (grant 409079/2024-3; INCT WETSCAPE).

Ethics Statement

The authors have nothing to report.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

Data sharing is not applicable to this article as no datasets were generated or analysed.

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