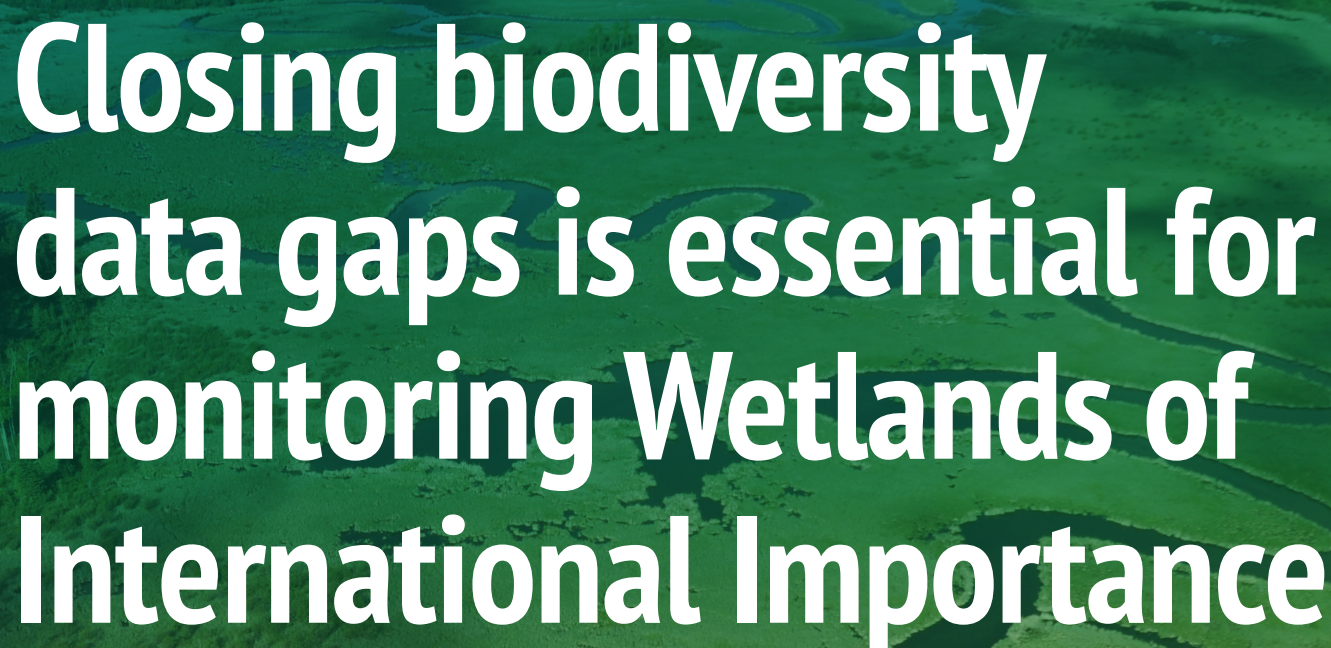




Contributors: Manuel Kern⁴

⁴ Convention on Wetlands, Gland, Switzerland

Key messages



The baseline: The **lack of consistent biodiversity reporting and basic site information for many Wetlands of International Importance** hinders systematic analysis and monitoring of biodiversity status across sites. *(supported by findings 1 and 2)*



The gap in coverage of listed species: Open biodiversity occurrence data hosted in GBIF can facilitate biodiversity monitoring. However, **GBIF-mediated data lack sufficient coverage to monitor the status of species whose presence relates to the international importance of the site**. Nearly half of the Wetlands of International Importance with listed species have zero occurrences in GBIF for these species, and this gap is geographically skewed. *(supported by findings 3 and 5)*



The gap in overall coverage: Furthermore, even when evaluating all available species occurrences, **98% of Wetlands of International Importance still lack sufficient taxonomic and geographical coverage of occurrences in GBIF** to monitor reliable temporal trends. *(supported by finding 4)*



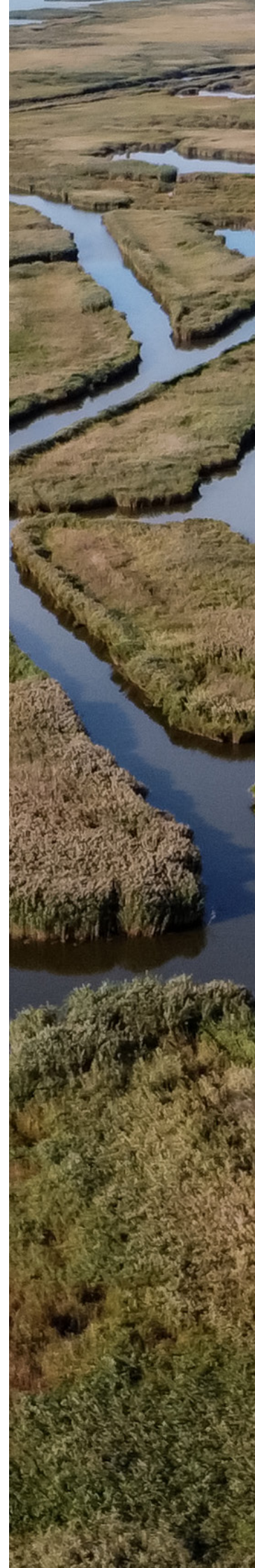
The trend: **The percentage of Wetlands of International Importance with at least one occurrence in GBIF matching the species whose presence relates to the international importance of the site has grown steadily** since the 1970s, but remains insufficient to support network-wide monitoring; by 2023, over half of the sites with listed species still have no occurrences in GBIF matching these species. *(supported by finding 6)*



The proposed solution: To make the most efficient use of available resources, Contracting Parties' reporting through the Convention's existing infrastructure should feed into GBIF, making species data open and FAIR (Findable, Accessible, Interoperable, Reusable) where appropriate, with safeguards for sensitive species data. This benefits Parties directly by drawing on additional datasets on GBIF to evaluate the status and trends of sites more comprehensively.

Introduction

Wetlands of International Importance, designated under the **Convention on Wetlands**, are critical sites for the conservation of global biodiversity¹. To assess whether biodiversity within these sites is being maintained or is in decline, access to reliable, long-term biodiversity data is required. We evaluated the availability of open biodiversity occurrence records hosted in the **Global Biodiversity Information Facility** (GBIF) and examined whether the species whose presence relates to the international importance of the site (listed in **Ramsar Information Sheets**²) have any occurrences in GBIF. **Our goal was to answer whether GBIF-mediated data are sufficient for monitoring the status and trends of biodiversity across the global network of Wetlands of International Importance.**





Policy recommendations

Open data platforms, like GBIF, can facilitate biodiversity monitoring of Wetlands of International Importance since they can offer a cost-effective way to fill data gaps. GBIF aggregates and standardises species records from a variety of sources (e.g., museums, citizen science platforms, research institutions), which can complement the information hosted by the Convention. This is particularly important given how infrequently Contracting Parties update the information on their designated sites. However, the main barrier to biodiversity monitoring is the limited availability of up-to-date, standardised and georeferenced species data for many sites. **Closing this biodiversity data gap for Wetlands of International Importance requires addressing upstream critical information deficits before open data tools can be effective:**



Contracting Parties are recommended to update the Ramsar Information Sheet (RIS) using resources available in the Ramsar Sites Information Service (RSIS, <https://rsis.ramsar.org/about>). This includes, among many features, a standardised reporting of species using well-known taxonomies (i.e., Catalogue of Life).



Contracting Parties should submit the boundaries of the designated sites in a digital form. Without georeferenced boundaries, linking open biodiversity data to Wetlands of International Importance is unreliable at scale, considerably limiting any potential research or monitoring effort carried out in the sites.



Interoperability and cooperation between GBIF and the Convention on Wetlands should be strengthened. GBIF can support data mobilisation from Contracting Parties to improve the flow of data from Wetlands of International Importance for the development of biodiversity indicators. In turn, the Convention can submit species information from RISs to GBIF to improve the coverage of open biodiversity data on wetlands. This two-way flow would enable Contracting Parties to leverage other existing datasets on GBIF to evaluate biodiversity status and trends at their sites more comprehensively.



Data mobilisation efforts should be prioritised in regions where biodiversity data remain limited, particularly across the Global South.

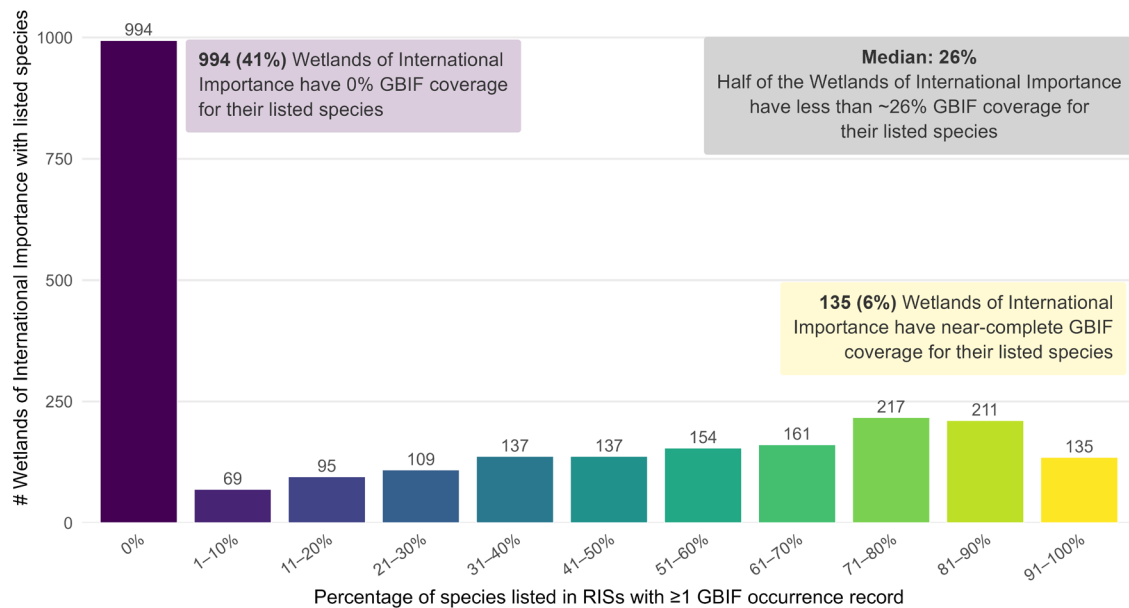
Main findings

- 1 74% (1 872) of Wetlands of International Importance lack up-to-date Ramsar Information Sheets (RISs >6 years)³**; yet, lists of species whose presence relates to the international importance of the site were available for 96% of sites (2 419), accounting for 18 686 unique species and subspecies.
- 2 35% (891) of Wetlands of International Importance do not have digital boundaries.** For these sites, any potential records in GBIF cannot be reliably identified or linked to the sites.
- 3 64% (1 619) of Wetlands of International Importance have spatially verifiable occurrence records hosted on GBIF** (19 sites have digital boundaries but no occurrences), accounting for 151 286 species and subspecies. However, these data in GBIF might not cover the species whose presence relates to the international importance of the site: among sites with RIS-listed species, 41% (994) lack any occurrences in GBIF, and only 135 sites (6%) achieve near-complete taxonomic coverage for their listed species (Fig. 1).
- 4 98% (2 469) of Wetlands of International Importance lack sufficient verifiable occurrences in GBIF to calculate reliable biodiversity trends over time.** After filtering for geographical precision, observation density, and sampling coverage, only 60 sites had sufficient data to calculate reliable temporal biodiversity trends, and in most cases, only for a limited time window.
- 5 GBIF coverage of RIS-listed species is highly unequal geographically:** The number of Wetlands of International Importance with occurrences in GBIF matching their listed species is high in Europe (particularly Western and Northern Europe), while it is very low in Central Africa, South/Southeast Asia, and parts of the Americas (Fig. 2).
- 6 By 2023, 45% (1 082) of the Wetlands of International Importance with RIS-listed species had at least one occurrence in GBIF matching those species** – a steady increase from 10% (253) in 1971, but still short of covering half the network after five decades (Fig. 3).



For most Wetlands of International Importance, few of their species listed in Ramsar Information Sheets (RISs) have occurrence records in GBIF

RIS-listed species from 2419 Wetlands of International Importance were matched against occurrence records in GBIF

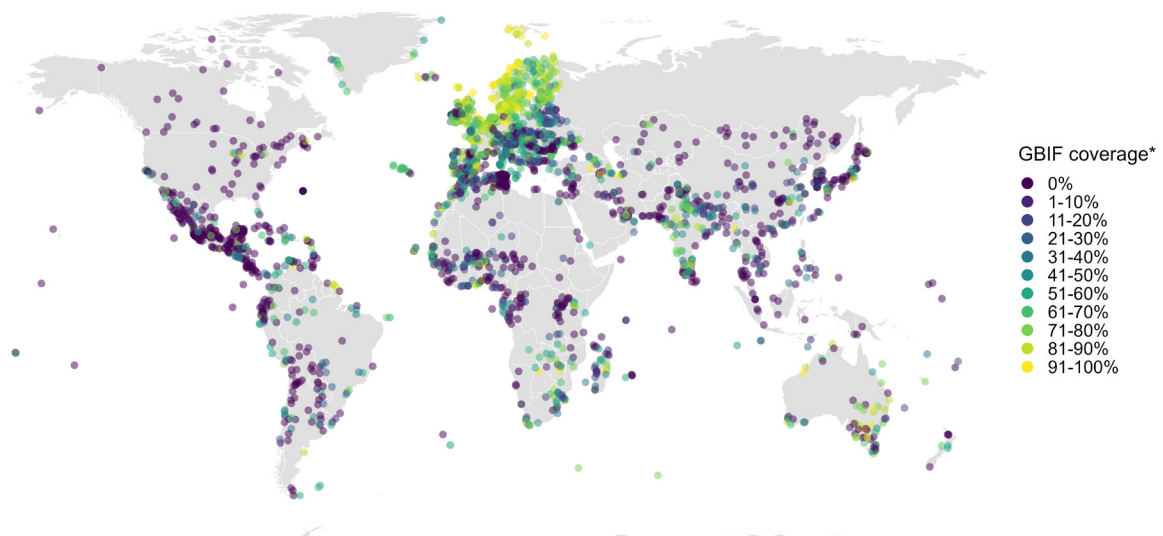


Sources: Species whose presence relates to the international importance of the site, listed in RISs. Available at <https://rsis.ramsar.org/>
GBIF-mediated records for Wetlands of International Importance matching RIS-listed species. Available at <https://www.gbif.org/>

Figure 1. Percentage of species whose presence relates to the international importance of the site with at least one occurrence record in GBIF. Across 2 419 Wetlands of International Importance with such species listed in their Ramsar Information Sheets (RIS), nearly half have no records in GBIF for any of these RIS-listed species, and the median coverage is 26%. GBIF coverage of RIS-listed species is broadly flat across the remaining bins, with a slight accumulation of well-documented sites in the 71–90% range.

GBIF coverage* of species listed in Ramsar Information Sheets (RISs) is biased geographically

2419 Wetlands of International Importance coloured based on the percentage of RIS-listed species with ≥1 occurrence in GBIF



Sources: Species whose presence relates to the international importance of the site, listed in RISs. Available at <https://rsis.ramsar.org/>
GBIF-mediated records for Wetlands of International Importance matching RIS-listed species. Available at <https://www.gbif.org/>

*GBIF coverage refers to the percentage of RIS-listed species with at least one occurrence record in GBIF

Figure 2. Global distribution of GBIF coverage of species whose presence relates to the international importance of the site across 2 419 Wetlands of International Importance. Coverage is highly unequal geographically: high-coverage sites (yellow tones) are concentrated in Western and Northern Europe, while sites across Africa, South and Southeast Asia, and parts of Latin America show little or no GBIF representation (dark purple). Coverage refers to the percentage of species listed in Ramsar Information Sheets with at least one occurrence record in GBIF. Locations are based on the coordinates reported for each Wetland of International Importance.

The percentage of Wetlands of International Importance with records in GBIF matching the species listed in their Ramsar Information Sheets (RISs) grows steadily from 10% to roughly 45% in over 40 years

RIS-listed species from 2419 Wetlands of International Importance were matched with yearly occurrence records in GBIF

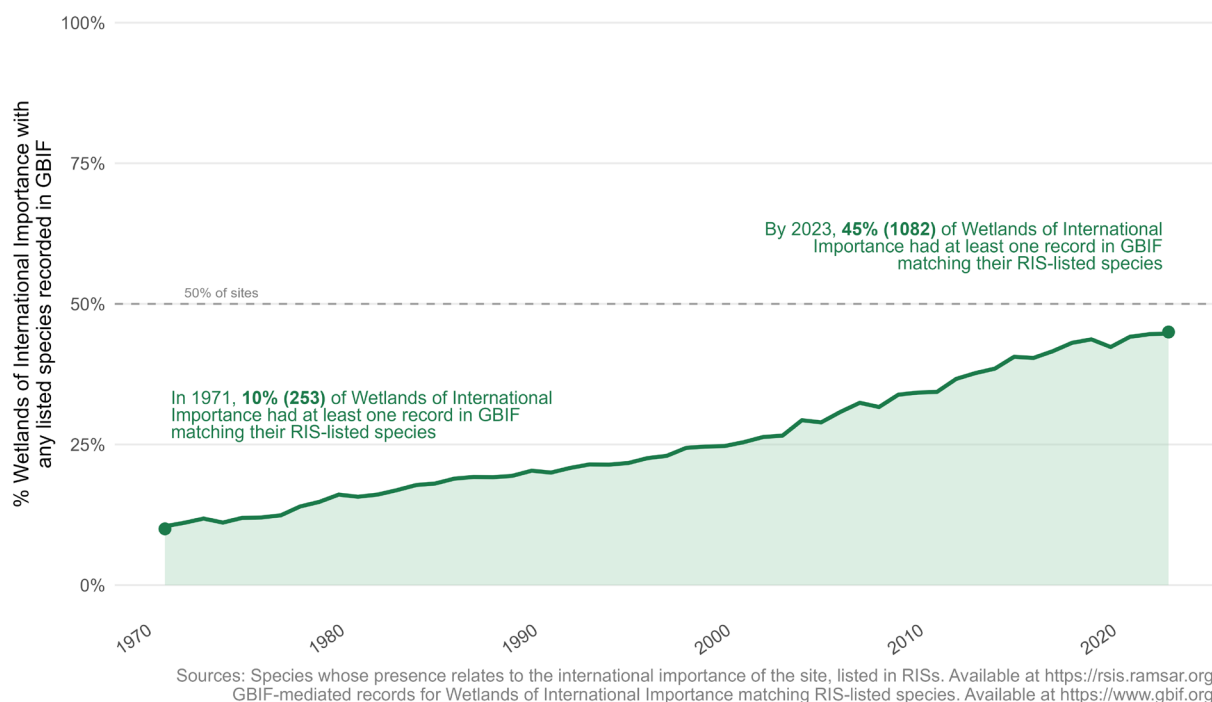


Figure 3. Trends in the percentage of Wetlands of International Importance with at least one occurrence record in GBIF matching the species whose presence relates to the international importance of the site, 1971–2023. Steady growth since 1971, yet by 2023, 55% of sites still had no occurrences in GBIF matching species listed in their Ramsar Information Sheets.

The approach

Each Wetland of International Importance has a **Ramsar Information Sheet (RIS)** describing the site, its location, and listing all species whose presence relates to the international importance of the site². We accessed the species lists in the Convention's database (1 820 sites); when no species list was available (599 sites), we extracted the species from the RIS² in PDF (total of 2 419 sites with listed species). In addition, we downloaded species occurrence data from GBIF within each site's boundaries using data cubes⁴. This was only possible when the boundaries of the Wetland of International Importance were available in digital form (e.g., shapefile).

For the species whose presence relates to the international importance of the site, listed in RISs, we explored the availability of occurrence records on GBIF. We counted how many RIS-listed species in each Wetland of International Importance had occurrences in GBIF, and analysed spatial and temporal coverage.

In addition, we analysed all species occurrences on GBIF for each Wetland of International Importance (without matching to listed species). We quantified the degree of data sufficiency to calculate biodiversity metrics and trends by filtering for geographical precision, observation density, sampling completeness, and controlling for sampling effort.



What is The Convention on Wetlands?



Wetlands are among the most diverse and productive ecosystems, providing essential services and supplying our fresh water — yet they continue to be degraded and converted to other uses. The **Convention on Wetlands** (Ramsar, 1971) is dedicated to their conservation and wise use worldwide through national action supported by international cooperation¹. Nations join the Convention by identifying wetlands in their territories and including them in the List of Wetlands of International Importance. These wetlands are designated if they meet at least one of nine qualifying criteria¹ from representative or rare wetland ecosystems to sites supporting biological diversity, particularly waterbirds, fish, and other endangered species. Currently, there are **2 529 Wetlands of International Importance** across 172 Contracting Parties. **At designation, and at least every six years thereafter, Contracting Parties complete a Ramsar Information Sheet (RIS)** via the Ramsar Sites Information Service (<https://rsis.ramsar.org/>). RISs include general information on the site, justification for its inclusion, an ecological description, and the site's management needs. Importantly, each **RIS includes a list of species whose presence relates to the site's international importance**.

What is GBIF?



GBIF (Global Biodiversity Information Facility) is an international open-data infrastructure funded by governments worldwide that **aggregates and provides free access to hundreds of millions of biodiversity records**. In this study, GBIF-mediated data served as a proxy for open data availability.

References

- ¹Strategic Plan of the Convention on Wetlands 2025-2034. COP 15, 2025. https://www.ramsar.org/sites/default/files/2025-09/Convention_on_Wetlands_fifth_strategic_plan_e.docx
- ²Ramsar Information Sheets (RISs) hosted in Ramsar Sites Information Service (RSIS, <https://rsis.ramsar.org/about>). Accessed May 2026.
- ³Report of the Secretariat pursuant to Article 8.2 on the List of Wetlands of International Importance, COP15 Doc.9. 2025. <https://www.ramsar.org/document/cop15-doc9-rev1-report-secretariat-pursuant-article-82-list-wetlands-international>
- ⁴GBIF.org (23 June 2025) GBIF Occurrence Download <https://doi.org/10.15468/dl.qyamab>; <https://doi.org/10.15468/dl.d5a7c4>; <https://doi.org/10.15468/dl.eqkqd7>; <https://doi.org/10.15468/dl.ywrhss>; (26 June 2025) <https://doi.org/10.15468/dl.6xtqh2>; (3 July 2025) <https://doi.org/10.15468/dl.je5pet>; <https://doi.org/10.15468/dl.ms7xs>; (23 June 2026) <https://doi.org/10.15468/dl.47sycn>



BIODIVERSITY
BUILDING
BLOCKS FOR
POLICY

PROJECT COORDINATOR

Dr Quentin Groom
Meise Botanic Garden
quentin.groom@plantentuinmeise.be

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WEBSITE

b-cubed.eu

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World of biodiversity

Consortium

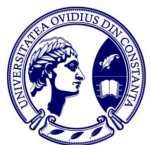
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