**Accounting for Inland Water ecosystems and Biodiversity in the Kunming-Montreal GBF Monitoring Framework |** A set of resources and preliminary recommendations for the Ad-Hoc Technical Expert Group to support the July 11th 2023 Meeting

*Key points;*

1. *Inland waters cover a small fraction of the planet, and their status and dependent biodiversity is among the most threatened.*
2. *Several recent publications by UN Water, Ramsar, GEOBON, IUCN and others document that meeting the GBF 2030 vision and goals will require explicitly tracking progress for inland waters in the area-based biodiversity (T1-3) and sustainable use and benefits sharing targets, among others.*
3. *Developing baselines and measuring progress is feasible. In the last decade, the types, availability, and processing capability of global inland water-related datasets have increased exponentially. Recommendations and information for indicator metadata templates are included.*
4. *Consider assessing and ensuring representation of inland waters expertise in each relevant subgroup (direct or outside advisory support) in addition to MEA indicator coordination.*

Dear esteemed members of CBD AHTEG,

**Diagram

Description automatically generated**We are writing as a coalition of organizations committed to the 2030 mission of the Kunming-Montreal Global Biodiversity Framework (GBF) (Text Box 1). With this commitment – we highlight that inland water ecosystems are among the most threatened on the planet. Their dependent populations are declining at twice the rate of marine and terrestrial ecosystems and almost one in three freshwater species is threatened by extinction.In fact, their rate of decline is a driving force in the overall estimate of global decline in biodiversity(Figure 1).The impacts of these declines reverberate in the ecosystem services inland waters provide, including drought- and flood-risk reduction, water supply provisioning, climate change mitigation and adaption, and food security.

**The 2030 mission of the Kunming-Montreal Global Biodiversity Framework:**

“To take urgent action to halt and reverse biodiversity loss to put nature on a path to recovery for the benefit of people and planet by conserving and sustainably using biodiversity and by ensuring the fair and equitable sharing of benefits from the use of genetic resources, while providing the necessary means of implementation”

**Text Box 1.** 2030 K-M GBF Vision and **Figure 1.** Decline in monitored populations of vertebrate species since 1970 (WWF Living Planet Index 2022)

**Underpinned by a significant weight of evidence, achieving the 2030 mission of the GBF requires *explicit* inclusion of inland waters in the GBF goals and targets, monitoring framework (headline and component indicators), and implementation financing.** In the lead-up to COP-15, this weight of evidence and recommendations for closing the gap were documented through several publications and resolutions led by UN Water, IUCN, GEO BON, Ramsar Convention and civil society, including;

* **UN-Water input on Freshwater-Biodiversity Linkages**: Response to the Zero-Draft Document from the Open-Ended Working Group on the Post-2020 Global Biodiversity Framework: UN Water, February 2020,[[1]](#footnote-1)
* **Ramsar Convention on Wetlands Comments on the First Draft of the post-2020 GBF[[2]](#footnote-2), and Resolution XIV.6 on Enhancing the Convention’s visibility and synergies with other multilateral environmental agreements and other international institutions** which “Encourages the Secretariat and Contracting Parties that are also Parties to the CBD to enable the adequate recognition of wetlands in the goals, targets and indicators of the post-2020 Global Biodiversity Framework” (paragraph 42)[[3]](#footnote-3)
* **Inland Waters in the Post-2020 Global Biodiversity Framework**: GEO BON and FWBON, 2022.[[4]](#footnote-4)
* **[Target 2] The Post**-**2020 Global Biodiversity Framework Proposal on Target 2**: **Ecosystem Restoration for Inland Waters**; WWF, FWBON, Wetlands International, UN Decade on Ecosystem Restoration, TNC, Oct 2022[[5]](#footnote-5)
* **[Target 3] A Pathway for Inland Waters in the 30 x 30 Target**: A Draft Technical Report for COP-15: IUCN WCPA, IUCN SSC, TNC & WWF, November 2022,[[6]](#footnote-6)
* **[Target 5] Post-2020 Global Biodiversity Framework: An Indicator to Monitor the Threats to Inland Fisheries as a Component of Target 5:** EBCD, IUCN CEM FEG, InFish, Inland Fisheries Alliance[[7]](#footnote-7)

In addition to sharing these foundational resources to support the overarching objectives of the AHTEG, we outline a few timely recommendations related to the objectives of the July 11th meeting. We’ve organized this information in two parts – the first is on process and methods for review and the second is to share timely information related to specific headline indicators and metadata.

1. **Process and methods for reviewing indicators**
2. **Ecological representation in indicator development and decision-making** –
   * Each sub-group (Groups 1,2,3,4 and 5) will be reviewing several indicators and metadata that should include representation of inland waters and dependent biodiversity (Table 1 below), in addition to terrestrial, coastal and marine.
   * Before the review begins, we recommend assessing group composition and expertise to ensure that *at least one* expert in the sub-group can represent the perspective of inland water ecosystems and/or dependent biodiversity and ecosystem services (the same for terrestrial, marine and coastal). If the group make-up does not allow for that representation in expert review and decision-making, we request, at a minimum, the co-chair support the designation of a representative of the group to (1) be accountable for this perspective throughout the review process (regardless of expertise) and, (2) coordinate outside advisory support to deliver information on gaps, needs, data availability and timelines. Our group of organizations would be honored to provide coordinated support on any related requests.
3. **Coordination on across connected MEA indicators –** Recommend continued and strong coordination across MEAs including the opportunity to review headline and component indicators. For inland waters, this includes but is not limited to;
   1. Ramsar Convention on Wetlands. The Ramsar STRP workplan includes specific tasks (4.1 and 5.2) dedicated to implementation of the GBF[[8]](#footnote-8) including but not limited to GBF Goal A and Targets 1, 2 and 3.
   2. SDGs (including but not limited to 6.6.1 and 15.1) (UNEP and Ramsar are co-custodians of 6.6.1 and listed in additional contacts for the indicator templates below).
   3. UN Decade on Restoration – we understand this coordination is happening through the Target 2 Partnership.
   4. UNFCCC – climate change mitigation and adaptation (ecosystem services)
4. **Template questions for indicator metadata**- To verify ecological representation in the metadata/method, consider adding a question to the template, as appropriate. For example; “Is the headline indicator intended to represent all ecosystems (terrestrial, inland water, coastal and marine)? If yes, is there a gap in the indicator method/metadata, to provide that representation?
5. **Specific considerations for inland waters in headline indicators**

As evidenced above, the status of inland waters, their biodiversity, and the ecosystem services they sustain will play a significant role in achieving the vision, mission, goals and targets of the K-M GBF. However, they are at risk of not being accounted for in the monitoring framework headline indicators metadata. **The tables below include additional information and recommendations for representation of inland waters in headline indicators 2.2 (Table 2), 3.1 (Table 3), and 5.1 and 9.1 (Table 4), consistent with the AHTEG indicator metadata templates.** As described above, these are preliminary recommendations recognizing the draft headline indicator methods are not yet publicly available. In addition to Tables 2, 3 and 4, we share a few considerations for the AHTEG below based on the rationale provided in the published resources on page 2, above.

* All area-based goal and target indicators should explicitly track inland water extent. In addition to their concerning status, inland water ecosystems, including lakes, rivers, peatlands and other wetlands, cover *a very small fraction* of total global area. Lumping the measurement for inland waters (extent, restoration, conservation) with terrestrial and marine areas will not provide an indicative or meaningful indicator. Inland water-specific metrics should be included in the goal and target headline indicators, including:
  + - A.2 Extent of natural ecosystems;
    - 1.1 Percentage of land and sea area covered by biodiversity-inclusive spatial plans;
    - 2.2 Area under restoration; and
    - 3.1 Coverage of protected areas and other effective area-based conservation measures.
* Given the importance of inland fisheries to the three goals of the convention, fishery-related indicators (e.g. Target 5 & 9) must go beyond marine systems to be relevant and accountable for the specific social, economic and environmental characteristics of inland fisheries. It should be noted that fishery indicators developed for marine fisheries are often inappropriate for use in inland fisheries and alternative indicators are readily available for inland fisheries.
* Lastly, headline indicators for Targets 10 (areas managed sustainably) and 11 (nature’s contributions to people), should include headline indicators capable of representing inland waters consistent with the intent of the target.

**Table 1.** Headline indicators that will be reviewed by the AHTEG that should be representative of inland water areas/and or dependent biodiversity (\*\*).

| *Goals, Targets* | *Headline indicators that will be reviewed by AHTEG* |
| --- | --- |
| **AHTEG Group 1** | |
| A, 4, 5 | \*\*A.1 Red List of Ecosystems |  |
| \*\*A.2 Extent of natural ecosystems |
| \*\*A.3 Red List Index |
| \*\*A.4 The proportion of populations within species with an effective population size > 500 |
| \*\*5.1 Proportion of fish stocks within biologically sustainable levels |
| **AHTEG Group 2** | |
| B, 9, 10, 11 | \*\*B.1 Services provided by ecosystems*a* |  |
| \*\*9.1 Benefits from the sustainable use of wild species*a* |
| \*\*9.2 Percentage of the population in traditional occupations*a* |
| 10.1 Proportion of agricultural area under productive and sustainable agriculture |
| 10.2 Progress towards sustainable forest management |
| **AHTEG Group 3** | |
| C, 13, 15 | \*\*C.1 Indicator on monetary benefits received*a* |  |
| \*\*C.2 Indicator on non-monetary benefits*a* |
| \*\*15.1 Number of companies reporting on disclosures of risks, dependencies and impacts on biodiversity*a* |
| |  | | --- | | **AHTEG Group 4** | | |
| 1, 2, 3, 12 | \*\*1.1 Percentage of land and sea area covered by biodiversity-inclusive spatial plans*a* |  |
| \*\*2.2 Area under restoration*a* |
| \*\*3.1 Coverage of protected areas and other effective area-based conservation measures |
| \*\*12.1 Average share of the built-up area of cities that is green/blue space for public use for all |
| **AHTEG Group 5** | |
| 6, 7, 21 | \*\*6.1 Rate of invasive alien species establishment |  |
| \*\*7.1 Index of coastal eutrophication potential |
| \*\*7.2 Pesticide environment concentration*a* |
| 21.1 Indicator on biodiversity information for monitoring the Kunming-Montreal Global Biodiversity Framework |

**Table 2.** Information to support AHTEG GROUP 4 - template for observations regarding indicator 2.2. for inland waters This information can be updated when the draft metadata sheet is made available publicly.

|  |  |
| --- | --- |
| **Indicator** | **2.2 Area under restoration** |
| **Goal/Target** | **Target 2** |
| **Current status** | Need for harmonization and inclusion of inland water-specific metrics within the area under restoration indicator. Data and metrics exist that could be incorporated under this indicator (e.g., remote sensing measures of extent of riparian buffers along inland waters, kilometers of river affected by dam removals or environmental flow implementation, area of wetlands restored). We recommend that countries include specific national targets in ha and km for wetland restoration and plans to deliver, contributing to the restoration of at least 30 percent of areas of degraded terrestrial, inland water, and coastal and marine ecosystems by 2030. Global datasets exist for area of wetlands lost[[9]](#footnote-9)[[10]](#footnote-10) and km of river with affected flows and connectivity impairment[[11]](#footnote-11). |
| Next steps in terms of finalizing the metadata and operationalizing the indicator? | There are several ongoing efforts that could be combined to provide a consolidated set of recommendations for ensuring representation of inland waters within the measurement of area under restoration. Please contact Michele Thieme (michele.thieme@WWFUS.ORG) for more information. |
| Who needs to be involved in finalizing the indicator, and have they been consulted or contacted? | We would recommend consultation with the Task 5.2 working group of Ramsar’s SRTP (<https://www.ramsar.org/sites/default/files/documents/library/sc62_19_strp_chair_e.pdf>), Freshwater BON of GEO BON, and the working group of the Freshwater Challenge, each of which have been working to support the comprehensive inclusion of inland waters in the Kunming-Montreal Framework. |
| How could issues related to indigenous peoples and local communities be reflected in the indicator? | Indigenous peoples and local communities are at the forefront of experiencing the effects of degraded inland waters and are often at the forefront of restoration efforts such that inclusion of inland water restoration targets is critical to ensure that these efforts are well reflected in the monitoring of the GBF. |
| Are there any critical gaps with regard to the indicators identified for the goals and targets being considered by the subgroup? | Water quality is not well reflected in a measure of areal extent of restoration and, thus, should be prioritized in other facets of the monitoring of the GBF or reconsidered within this indicator. |

\_\_\_\_\_\_\_\_\_\_

**Table 3.** Information to support AHTEG GROUP 4 - template for observations regarding indicator 3.1. for inland waters. This information can be updated when the draft metadata sheet is made available publicly.

|  |  |
| --- | --- |
| **Indicator** | **3.1 Coverage of protected areas and other effective area-based conservation measures** |
| **Goal/Target** | **Target 3** |
| **Current status** | 3.1 Indicator metadata (**Appendix 1**) is incomplete to meet the K-M GBF intent of addressing evidence-based gaps for understanding the coverage of inland water areas and dependent biodiversity from protected and conserved areas. Inland water-specific metrics are needed.  Since inland water ecosystems, including lakes, rivers, peatlands and other wetlands, cover a very small fraction of total global area, lumping the indicator for inland waters with terrestrial and marine areas (inland waters are present in both), has and would continue to strongly skew the statistic in a way that fails to report meaningfully on conservation coverage of inland waters by protected areas and OECMs.  Two expert workshops were held in 2022 including representatives from IUCN, UN Water, UNEP WCMC Protected Planet team, and others to review best available data to (1) represent the extent of inland waters and (2) define coverage. **The determination from these workshops was that sufficient data are available to develop and apply a method to estimate coverage of inland waters by PAs and OECMs** that is simple, has clear caveats, and can serve as a foundation that can accommodate growth and complexity over time (including methods to assess component indicators of effectiveness, connectivity and areas important for biodiversity).[[12]](#footnote-12) |
| Next steps in terms of finalizing the metadata and operationalizing the indicator? | A global assessment of the coverage of inland waters by protected areas and OECMs requires two data types (1) spatial data on the extent of area-based protections and (2) spatial data on the extent of inland water ecosystems. The former is included in the indicator metadata sheet (Appendix 1).  For the latter, there are three key next steps which could be completed before COP-16 to operationalize the 3.1 coverage indicator;   * + 1. Finalize the global spatial representation of the extent of inland waters. Several globally available datasets exist9. For example, comprehensively, the Global Lakes and Wetlands Database (2004)[[13]](#footnote-13), is under revision and GLWD V2 is expected to be publicly available in 2023. In the workshops mentioned above, key questions about extent were outlined and answered (ie representing extent over time from seasonal and interannual variability).     2. In parallel, finalize decision rules to apply to the coverage calculation. For example, inland water systems often serve as the boundaries of protected areas – or are not considered in the PCA designated protections (ie, allowing dams on rivers in national parks). Following the 2022 workshop recommendations, Confluvio, under contract with TNC, is testing a set of decision rules to be applied to the global coverage calculation for the representation of inland water areas.     3. Test at the national level – please see related question below. |
| Who needs to be involved in finalizing the indicator, and have they been consulted or contacted? | UNEP WCMC Protected Planet (Benjamin Lucas and Heather Bingham), UN (to coordinate with relevant SDGs including 6.6.1 and 15.1) Ramsar STRP (as referenced above), Freshwater Challenge members. Robin Abell or Tara Moberg with TNC ([rabell@tnc.org](mailto:rabell@tnc.org), [tmoberg@tnc.org](mailto:tmoberg@tnc.org)) could be an initial contact related to coordinated ongoing work. |
| Is testing at the national level needed? | Yes. Testing is needed and could be conducted over the next twelve months, before COP-16, with a focus on capturing hydrogeographic differences (climate, habitat types, geology, etc.). The extent of testing could be dependent on timing and funding availability. |
| What is a realistic timeline for finalizing the metadata and operationalizing the indicator? | We will be able to more clearly support this question when the draft indicator metadata is shared publicly. Based on the attached Oct 2022 version, we estimate that 14 months (by COP-16) would be a realistic timeline for finalizing the metadata and operationalizing an indicator to **estimate coverage of inland waters by PAs and OECMs** that is simple, has clear caveats, and can serve as a foundation that can accommodate growth and complexity over time. This assumes sufficient resourcing.  A comprehensive indicator for inland waters, that includes the critical components of effectiveness (PAME), areas important for biodiversity, connectivity, etc., would likely take a few years in addition, to finalize metadata and operationalize. |
| What are possible thematic or subject area disaggregations? | Depending on the draft metadata sheet, inland waters could potentially be assessed through a thematic disaggregation. Meaning, the indicator method could account for *both* - progress jointly toward 30% coverage, *and* independently tracks percent coverage for *each of* terrestrial, inland water, coastal and marine areas.  We emphasize that given extremely small global area coverage for inland waters, in addition to joint calculations provide little meaning for their conservation status (protected areas and OECMs) of the biome. |
| How could issues related to indigenous peoples and local communities be reflected in the indicator? | Critical to this indicator, Indigenous Peoples and local communities are important stewards of lands and waters, globally. These contributions should be clearly defined and accounted for. Related case studies are included in |
| Are there any critical gaps with regard to the indicators identified for the goals and targets being considered by the subgroup? | Described above. In addition, the K-M GBF component indicators for (1) key biodiversity areas, (2) Protected Area Management Effectiveness (PAME), (3) Connectivity and (4) Species Protection Index should be reviewed and adapted for relevance to inland water areas. Some recommendations related to this are included in the Pathways for Inland Waters in the 30 x 30 Target report. |
| Other issues to bring to the attention of the Ad Hoc Technical Expert Group | For all area-based targets, all ecosystem areas (terrestrial, inland water, coastal, marine), will permanently change in terms of absolute extent with the changing climate. A reasonable method to account for this change should be developed for indicator 3.1. |

**Table 4**. Information to support AHTEG GROUPS 1 & 2 - template for observations regarding indicators 5.1 and 9.1 for inland waters. This information can be updated when the draft metadata sheet is made available publicly.

|  |  |
| --- | --- |
| **Indicator(s)** | **5.1 Proportion of fish stocks within biologically sustainable levels** |
| **Goal/Target** | **Targets 5 and 9** |
| **Current status** | Fishery-related indicators (e.g. Target 5 & 9) must be relevant and accountable for the specific social, economic and environmental characteristics of inland fisheries. It should be noted that fishery indicators developed for marine fisheries are often inappropriate for use in inland fisheries.  It is crucial to adopt appropriate indicators for inland fisheries given the biological importance (and current global decline) of freshwater fish biodiversity, which account for nearly similar species biodiversity than marine ecosystems despite being a fraction of the latter’s volume. Moreover, this protects Indigenous people and local communities’ interests as being disproportionately dependent on inland fisheries as essential food and livelihood sources, especially in land-locked countries.  Inland fisheries are data-poor and efforts must ensure this does not limit monitoring of a key biodiversity component and resource.  To this end, the Food and Agriculture Organization of the United Nations (FAO) and the United States Geological Survey (USGS) have developed an indicator for assessing threats to inland fisheries. FAO and USGS have created a global threat map for inland fisheries using a composite threat indicator that combines 20 identified anthropogenic pressure categories (e.g., climate, harvest, habitat, pollution, invasives) that act across hydrological catchments and affect inland fisheries. The threat indicator includes outputs from over 150 spatial data layers across those categories.  This was proposed at the United Nations Biodiversity Conference COP15 See:  <https://static1.squarespace.com/static/600f3c551f5d246dcefc421b/t/6388e87da623a5739dec1ab6/1669916853747/Briefing+Document+-+Inland+Fisheries+Indicator> |
| Next steps in terms of finalizing the metadata and operationalizing the indicator? | The methodology for the indicator is going undergoing peer-review for publication. It is intended the data and methods will be open source. Moreover, the approach has been designed for updated inputs to be used to provide the latest indicator result. |
| Who needs to be involved in finalizing the indicator, and have they been consulted or contacted? | At the moment, the current indicator methodology is being peer-reviewed. However, it is expected for the methodology to be improved through consultation with 1) GIS experts (e.g. GEOBON) and 2) national level experts. The team welcomes further consultation with other interested and appropriate communities. These have not yet been consulted and it is hoped to have support in doing this. |
| Is testing at the national level needed? | It is encouraged to have national level testing to build confidence in the indicator. Moreover, the methodology has an explicit ‘calibration’ step involving local experts, and so it national level ‘testing’ will improve the indicator output. |
| What is a realistic timeline for finalizing the metadata and operationalizing the indicator? | The indicator has already been used to estimate output values for all regions. It is potentially already ‘operationalized’ bar validation and further improvement through consultation and testing (as above) as well as revisions and updates to input metadata. |
| How could gender perspectives be reflected in the indicator? | This will be difficult to reflect directly in the indicator. The spatial scale and the distributed and inherently diverse communities engaging in inland fishery harvest and post-harvest processing makes fine-scale gender insights difficult.  However, 50% of the millions engaging in inland fisheries for food and livelihood are women, and gender empowerment and rights has long been a focal area of work in inland fisheries development and research. Elevating the condition of inland fisheries globally will elevate gender perspectives. |
| How could issues related to indigenous peoples and local communities be reflected in the indicator? | Reflection of Indigenous people and local communities will be difficult to reflect directly in the indicator. The spatial scale and the distributed and inherently diverse communities engaging in inland fishery harvest and post-harvest processing makes fine-scale gender insights difficult.  Nevertheless, inland fisheries are key food and livelihood sources of Indigenous people and local communities globally, often with strong cultural identity values as fishers or ‘spiritually’ linked with fish. Community-based co-management involving the IPLC groups with the governance and management of inland fisheries is an adopted approach to address inland fishery threats globally. It strengthens the rights to access and manage inland fish resources and is a path towards conserving freshwater fish biodiversity and subsequent sustainable use. |
| Are there any critical gaps with regard to the indicators identified for the goals and targets being considered by the subgroup? | Indicators developed for marine fisheries are not appropriate for wide use in inland contexts. Apart from large lakes, which operate as small seas, freshwater ecosystems like rivers and wetlands, as well as dryland fisheries, are very different from the marine context on which previous indicators have been developed. These often relate to the theoretical ‘Maximum Sustainable Yield’ (MSY) that fish stock ‘health’ is compared against.  Freshwater ecosystems and their fish populations are naturally highly variable and under threat from concurrently occurring diverse and numerous threats, like flow modification, pollution and loss of connectivity. Adopting an indicator around MSY and a sole focus on fishing threats is not appropriate. Moreover, it fails to account for equitability of access and groups benefiting from inland fisheries. |

\_\_\_\_\_\_\_\_\_\_

1. UN-Water 2020. <https://www.unwater.org/publications/un-water-input-freshwater-biodiversity-linkages-response-zero-draft-document-open> [↑](#footnote-ref-1)
2. Secretariat of the Ramsar Convention on Wetlands, Comments on First Draft. March 2022. [Notification | Convention on Wetlands Contacts Database (ramsar.org)](https://contacts.ramsar.org/notification/view/1599) [↑](#footnote-ref-2)
3. <https://www.ramsar.org/sites/default/files/documents/library/xiv.6_synergies_e.pdf> [↑](#footnote-ref-3)
4. GEO BON and FWBON 2022. <https://geobon.org/wp-content/uploads/2022/12/InlandWaters_Brief.pdf> [↑](#footnote-ref-4)
5. WWF, FWBON, WI, UN Decade on Ecosystem Restoration, TNC 2022. [1110\_\_int\_briefing5lr.pdf (panda.org)](https://wwfint.awsassets.panda.org/downloads/1110__int_briefing5lr.pdf) [↑](#footnote-ref-5)
6. IUCN WCPA, IUCN SSC, TNC and WWF 2022. <https://www.nature.org/content/dam/tnc/nature/en/documents/Pathway_for_Inland_Waters_Nov_2022.pdf> [↑](#footnote-ref-6)
7. EBCD et al. 2022. [An indicator to monitor threats to Inland Fisheries as a Component of T5](https://static1.squarespace.com/static/600f3c551f5d246dcefc421b/t/6388e87da623a5739dec1ab6/1669916853747/Briefing+Document+-+Inland+Fisheries+Indicator) [↑](#footnote-ref-7)
8. [sc62\_19\_strp\_chair\_e.pdf (ramsar.org)](https://www.ramsar.org/sites/default/files/documents/library/sc62_19_strp_chair_e.pdf) [↑](#footnote-ref-8)
9. Dixon, M.J.R., Loh, J., Davidson, N.C. and M.J. Walpole. 2016. Tracking global change in ecosystem area: The Wetland Extent Trends Index. Biological Conservation 193: 27-35. [↑](#footnote-ref-9)
10. UN World Conservation Monitoring Centre. 2017. Wetland Extent Trends [WET] Index. Cambridge, UK [↑](#footnote-ref-10)
11. Grill G, Lehner B, Thieme M, Geenen B, Tickner D, Antonelli F, Babu S, Borrelli P, Cheng L, Crochetiere H, Ehalt Macedo H, Filgueiras R, Goichot M, Higgins J, Hogan Z, Lip B, McClain ME, Meng J, Mulligan M, Nilsson C, Olden JD, Opperman JJ, Petry P, Reidy Liermann C, Sáenz L, Salinas-Rodríguez S, Schelle P, Schmitt RJP, Snider J, Tan F, Tockner K, Valdujo PH, van Soesbergen A, Zarfl C. 2019. Mapping the world’s free-flowing rivers. Nature 569:215-221. [↑](#footnote-ref-11)
12. IUCN WDPA, Equilibrium Research, TNC, WWF, IUCN SSC, 2022. Pathways for Inland Waters in the 30x30 Target: A draft technical report prepared for COP-15. pp 79-86. <https://www.nature.org/content/dam/tnc/nature/en/documents/Pathway_for_Inland_Waters_Nov_2022.pdf> [↑](#footnote-ref-12)
13. Lehner, B., Döll, P.: **Development and validation of a global database of lakes, reservoirs and wetlands**, Journal of Hydrology, Volume 296, Issues 1–4, 20 August 2004, Pages 1-22, http://dx.doi.org/10.1016/j.jhydrol.2004.03.028. [↑](#footnote-ref-13)