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FRESHWATER FISH

(Prepared by the COP-appointed Councillor for Freshwater Fish and the Secretariat)

ANNEX 2

GLOBAL ASSESSMENT OF MIGRATORY FRESHWATER FISHES AND AMAZON CASE STUDY:

SUMMARY AND RECOMMENDATIONS

Summary of *Global Assessment of Migratory Freshwater Fishes*

1. Freshwater fishes are among the most imperilled vertebrates, and many migratory species now face declines driven by loss of connectivity, flow alteration, habitat degradation, exploitation, pollution, and interacting pressures across borders. Recognizing these trends and their transboundary nature, the Convention on the Conservation of Migratory Species of Wild Animals (CMS) has sought stronger, coordinated action for inland fishes that move across national jurisdictions.

2. The document builds on the original CMS review of migratory freshwater fishes published in 2011 (UNEP/CMS/Inf.10.33). Since then, IUCN Red List coverage of freshwater fishes has expanded from ~3,000 to nearly 15,000 assessed species, enabling a much more complete picture of status and trends. The current report was prepared in response to COP14 Decision 14.112(a), which requested the Scientific Council to update the 2011 review.

3. **Objectives**: The report (i) summarizes current knowledge on migratory freshwater fishes, (ii) identifies species that meet CMS criteria and could benefit from listing, and (iii) outlines practical options for CMS Parties and Range States to improve management and conservation through listings and cooperation instruments.

4. **Methods**: To generate a CMS-actionable list, we combined expanded IUCN assessments with a new global migratory fish dataset and additional sources, then applied CMS criteria for transboundary migration and 'unfavorable' conservation status. Key elements of the evidence base included:

   - the IUCN Red List for status, threats and trends, along with multiple databases (FishBase, GROMS, North American and regional migratory fish datasets, Mekong River Commission resources, Trans-European Swimways/Wetlands International, South Africa River Eco-classification, New Zealand Freshwater Fish Database) and recent peer-reviewed literature and expert knowledge;
   - transboundary confirmation, based on the intersection of species' inland ranges with connected, cross-border drainage networks, including marine phases where they create shared inland stocks; and
   - consideration of conservation status, which includes species categorized by the IUCN as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Data Deficient (DD), Not Evaluated (NE) and Least Concern (LC), with credible evidence of decline or risk, or where the IUCN determines the trend as 'Decreasing'.

5. **Results:** The analysis identified 349 migratory, transboundary freshwater fishes that potentially meet the criteria for listing on the CMS Appendices; 24 are already listed, leaving 325 candidate species for prospective action. Candidate occurrences are concentrated in Asia (n=205), with additional sets in South America (n=55), Africa (n=42), Europe (n=50), North America (n=32), and Oceania (n=6). Among non-listed

taxa, 136 species meet CR/EN/VU/NT thresholds, and of these, 75 occur in two or more CMS Parties (strong near-term listing prospects).

6. **Priority regions:** Consistent with the global assessment and case studies in this report, several transboundary systems emerge as areas where CMS cooperation is both necessary and feasible:
   - the Amazon and La Plata–Paraná–Paraguay in South America (long-distance catfishes and characids; floodplain nursery protections; coordinated seasonal closures; high-gain barrier retrofits);
   - the Danube and connected European basins (potamodromous cypriniforms and remaining sturgeon/lamprey runs; sediment continuity and passage across multiple Parties);
   - the Congo, Niger–Lake Chad, and Nile in Africa (shared stocks, drought sensitivity, and fragmentation that calls for cooperative monitoring and flow/water-quality measures);
   - the Mekong and Ganges–Brahmaputra–Meghna in Asia (high biomass of migrants; dams and hydropeaking; harvest coordination via regional bodies with CMS alignment);
   - and regional anguillid eel measures in Oceania (passage standards; life-stage fishery regulation; shared recruitment indices).

7. **Regional and taxonomic gaps:** The Mekong River Basin represents a major gap. It supports globally significant freshwater biodiversity and numerous migratory species, including several that are Critically Endangered or Endangered. Dozens of Mekong species would likely benefit from coordinated international management, shared monitoring and connectivity safeguards. While the countries of the Lower Mekong are not currently Parties to CMS, closer engagement with and consideration of accession to the Convention would unlock access to established tools, technical support and a platform for sustained transboundary collaboration.

8. **Priority action pathways under CMS**: The report outlines complementary instruments that Parties and Range States can deploy singly or in combination: Listing on Appendix I/II**,** Concerted Actions**,** Single Species or Multi-Species Action Plans under COP Resolutions, ~~and~~ Memoranda of Understanding (MOUs) and Initiatives that flexibly engage Party and non-Party Range States.

9. **Integration with broader CMS work:** Freshwater fishes should be integrated into CMS themes on climatic change, ecological connectivity, energy and infrastructure, alongside technical guidance on identification of strategic river segments that are critical to migratory fishes as free flowing rivers, hydropower dam construction and management, fish stocking, aquaculture of alien invasive species, fish passage/screening, environmental flows tied to migration and larval drift, bycatch mitigation, and mixed-stock management. These linkages create coherence across taxa and basins and can align with flagship CMS publications (e.g., the *Atlas of Animal Migration*, *Status of the World's Migratory Species*) where relevant.

10. **Cross-cutting foundations and collaboration:** Success depends on shared baselines and indicators; improved knowledge of migration routes and stock structure; key segments in a basin scale maintained as free flowing river sections, maintaining/restoring connectivity and environmental flows; reducing habitat degradation and pollution; and inclusive, cross-sector governance with data sharing. The report highlights synergies with CBD**,** CITES, RAMSAR, river-basin organizations, FAO and the IUCN Red List network to expand capacity and align incentives.

11. **Next steps for Parties:** In the near term, Parties can:
    - (i) prepare proposals for listing high-priority taxa (those occurring in two or more Parties with CR/EN/VU/NT status);
    - (ii) develop Concerted Actions**,** Action Plans, ~~or~~ MOUs or Initiatives for listed species (e.g., catfish in the Amazon basin; large fishes from La Plata basin and the Mekong basin; listed sturgeon species), with clear work plans and technical advisory structures; and
    - (iii) mainstream freshwater fishes into CMS decisions, resolutions, working groups and cross-cutting products that advance on key habitat conservation as free flowing rivers, connectivity and reduce bycatch and infrastructure impacts.

Summary of *Assessment of Potential Candidate Freshwater Fish Species of the Amazon Basin for Listing on the Convention of Migratory Species Appendix II*

The full case study can be found as UNEP/CMS/COP15/Inf.25.6.1

1. **Case study - Amazon Basin**: A targeted Amazon assessment, integrating basin literature (2021–2025) and expert consultation, identified 33 migratory species (characiforms, siluriforms, osteoglossiforms) of unfavorable status or declining trends that meet the CMS criteria. These include long-distance pimelodid catfishes (e.g., *Brachyplatystoma* spp.), migratory characiforms (e.g., *Brycon* spp., *Prochilodus nigricans*, *Semaprochilodus insignis*), widely exploited serrasalmids (e.g., *Colossoma macropomum*), and *Arapaima gigas*. Experts identified 20 priority species for immediate action.

2. **Next steps**: For long-distance Amazon catfishes (including species already on Appendix II):
    - an Action Plan (standardized basin-scale population monitoring, corridor mapping, seasonal/size/gear rules, bycatch reduction, catch/trade documentation, mercury/sediment hotspot abatement),
    - an Amazon MOU or other coordination mechanism (to engage all Range States, including non-Parties), or
    - Concerted Actions (data sharing, harmonized harvest/trade measures, maintenance of ecological connectivity) as scalable building blocks.

Recommendations

1. Listings and cooperation instruments

- Prepare proposals to amend the Appendices for high-readiness taxa (occurring in two or more Parties and assessed as CR/EN/VU/NT).
- Initiate cooperation instruments for listed species – Concerted Actions, Species Action Plans (single or multi-species), ~~and~~ MOUs and Initiatives – with clear work plans and technical advisory structures.

2. Technical governance and expert support

- Establish an expert technical working group to advise the Scientific Council on migratory freshwater fishes (status reviews, listings, connectivity guidance and monitoring standards).

3. Evidence and assessment priorities

- Resolve assessment gaps by working with IUCN and the expert group to compile evidence for NE, DD and LC (decreasing trend) species flagged as likely meeting CMS criteria.
- Undertake Green Status (Green List) assessments for CMS-listed freshwater fishes and priority candidates identified in this report.
- Screening of free flowing rivers as key habitats for migratory freshwater fishes that are focus or candidate to future hydropower dam construction.
- Produce a status report summarizing the current conservation status and management progress for Appendix I freshwater fishes.
- Commission a global status review of migratory marine bony fishes (teleosts), mirroring the freshwater approach, to inform potential cross-realm actions.

4. Regional priorities

- Conduct targeted regional reviews (with expert consultation) in basins and regions with numerous transboundary migrants.
- Engage Lower Mekong, Orinoco, Nile, Okavango, Zambezi basin countries to explore pathways for coordinated management and potential accession/participation in CMS instruments.
- Initiate a structured review for Africa, where transboundary migrants are under-represented in current analyses and data gaps are likely.

5. Integrating freshwater fishes within CMS thematic areas

- Integrate freshwater fishes into CMS decisions, resolutions, working groups, and cross-cutting initiatives on ecological connectivity, energy, climatic change, linear infrastructure and bycatch reduction.
- Contribute a dedicated freshwater fishes module to the *Atlas of Animal Migration* and incorporate key findings into *State of the World's Migratory Species* and related CMS communication products.

6. Coordination with other conventions and partners

- Undertake a gap analysis of activities undertaken by CITES, CBD, RAMSAR, FAO, IUCN and river-basin organizations to identify where CMS adds the most value and to align actions on monitoring, connectivity safeguards and sustainable harvest/trade.

ANNEX 4

PROPOSED AMENDMENTS TO RESOLUTION 10.12

MIGRATORY FRESHWATER FISH

NB. Proposed new text is underlined. Text to be deleted is ~~crossed out~~.

Considering that the CMS Samarkand Strategic Plan for Migratory Species 2024-2032 foresees under Goal 1 that the conservation status of migratory species is improved, including that by 2029 all species with an unfavourable status are listed and regularly reviewed (Targets 1.1 and 1.2), and by 2032 their conservation status has improved (Target 1.3),

Further considering that the CMS Samarkand Strategic Plan for Migratory Species 2024-2032 foresees under Goal 2 that the habitats and ranges of migratory species are maintained and restored, supporting their connectivity, including that by 2029 all important habitats are identified, assessed and monitored (Target 2.1), and by 2032 these habitats are protected, effectively conserved and restored while habitat loss, degradation and fragmentation are reduced (Targets 2.2 and 2.3), and additionally under Goal 3 illegal and unsustainable take and overexploitation (Target 3.1), direct mortality caused from humanmade infrastructure (Target 3.2), pollution and poisoning affecting migratory species and their habitats (Target 3.3), impacts of climate change on migratory species and their habitats (Target 3.4), and the negative impacts of invasive alien species (Target 3.5).

Recognizing that bycatch and hydropower dam construction constitutes a significant threat to many migratory freshwater fish species, and that targeted action is required to address this issue,

Further r~~R~~ecognizing the obligations of the international community to conserve, protect and manage migratory freshwater fish as underpinned by, inter alia:

a) CBD Decision 15/4 on the Kunming-Montreal Global Biodiversity Framework, in particular Target 2 to ensure that at least 30 per cent of areas of degraded terrestrial, inland water, and marine and coastal ecosystems are under effective restoration and Target 3 to conserve at least 30 per cent of terrestrial and inland water areas, and of marine and coastal areas, as well as CBD Decision VII/4 on the revised programme of work of biological diversity of inland water ecosystems, and in particular goal 1.3 to enhance the conservation status of inland water biological diversity through rehabilitation and restoration of degraded ecosystems and the recovery of threatened species~~;~~,

b) CITES Resolution~~s Conf. 10.12 (Rev.) on the conservation of sturgeons, Conf. 11.13 on the introduction of a universal caviar labelling system, and~~ Conf. 12.7 (Rev. COP17~~CoP13~~) set~~s~~ting out a number of conservation management measures for sturgeon and paddlefish, including fishery management programmes, improving legislation, promoting regional agreements, development of marking systems, aquaculture, a universal caviar labelling system, and the control of illicit trade, as well as ~~CITES Decision 19.175 & 19.176 Labelling system for trade in caviar and Decisions 19.189 to 19.191 Aquatic species listed on the CITES Appendices, [and~~ all species listed on CITES Appendix I-III, including the COP19 listing of seven new freshwater stingray species on Appendix II, ~~and the COP20 listing of the genus *Anguilla*],~~; and

c) the FAO Code of Conduct for Responsible Fisheries, dealing mainly with good practice and policy development for freshwater and marine fisheries as outlined in its General Principles in Article 6, also giving recommendations for transboundary cooperation, inter alia, in Article 6.12 and Article 7.1.3.;

~~*Recalling* that CMS currently includes twenty-one species of freshwater fish on Appendices I and II;~~

~~*Considering* that the CMS Strategic Plan 2006-2011 and its updated version for the period 2012-2014 foresee under Objective 1 that reviews of status and conservation actions for Appendix I and Appendix II species are to be published at regular intervals;~~

~~*Taking note* of the preliminary discussion on freshwater fish at the 16th Meeting of the Scientific Council (Bonn, 28-30 June 2010) which recognized that these species were underrepresented on the CMS Appendices and where the Council welcomed the preparation of the review to be presented to its 17th Meeting;~~

Recalling the previous work undertaken under CMS on plastic pollution in Asian river systems, including the assessment of risks to migratory species in the Mekong and Ganga Rivers (UNEP/CMS/Inf.13.11/Rev.1), and recognizing its relevance for migratory freshwater fish,

Acknowledging ~~the review of migratory freshwater fish prepared by the COP- Appointed Scientific Councillor (UNEP/CMS/Conf.10.31 and UNEP/CMS/Inf.10.33),~~ the work of IUCN in assessing the status of freshwater fish, including the identification of Key Biodiversity Areas (KBAs), ~~maps of their distribution, and the contributions of Paraguay during the 16th meeting of the Scientific Council to identify and prioritize threatened migratory species in the La Plata basin to be listed on the Appendices of the Convention (UNEP/CMS/ScC16/Doc.7);~~

Recognizing that migratory strategies of inland fishes are diverse, with some species migrating wholly within freshwater, others moving between freshwater and marine ecosystems, and many species exhibiting multiple strategies whereby sub-populations in different river-reaches undertake distinct longitudinal or lateral movements,

Appreciating that while current efforts focus primarily on longitudinal migration, in many rivers long-distance downstream larval 'drift' and shorter-distance lateral movements are also essential to surivial,

Recalling that in line with Article II of the Convention, Range States should take action to conserve, protect and manage migratory species, and should endeavour to conclude Agreements to promote the conservation and management of migratory species,

Aware of the significant and continuing decline of freshwater fish populations through a wide range of threats, including overfishing, habitat destruction, invasive alien species, pollution and barriers to migration resulting in the loss of connectivity between critical habitats,

Taking note of the deficient information on the conservation status, migratory behaviour and ecology of freshwater fish and the need for further research, and

Noting further the importance of cooperation between Range States in furthering research, awareness raising and transboundary management of migratory freshwater fish, and that these activities could greatly strengthen conservation outcomes for this group of species,

The Conference of the Parties to the
Convention on the Conservation of Migratory Species of Wild Animals

1. *Takes note* of the *Global Assessment of Migratory Freshwater Fishes* which can be found as Annex 1 to UNEP/CMS/COP15/Doc.25.6.1 and under www.cms.int/document/freshwater-fish and the *Assessment of Potential Candidate Freshwater Fish Species of the Amazon Basin for Listing on the Convention of Migratory Species Appendix II* which can be found under the same website above ~~review of freshwater fish contained in documents UNEP/CMS/Conf. 10.31 and UNEP/CMS/Inf.10.33~~;

2. *Requests* Parties and *invites* non-Parties to strengthen measures to protect migratory freshwater fish species against threats, including habitat destruction, habitat fragmentation, overfishing, bycatch, invasive species, pollution and barriers to migration, such as the creation of protected areas and other effective area-based conservation measures in the upper reaches and lower floodplains that are important for the feeding and spawning cycles of wild migratory fish populations;

3. *Further requests* Parties to improve the monitoring of freshwater fish in order to assess the level of vulnerability of each population according to IUCN Red List criteria and to work collaboratively to improve knowledge of transboundary migratory fish in order better to identify species that would benefit from international cooperation;

4. *Urges* Parties to consider proposing for listing~~submit listing proposals for~~ those species highlighted in the review as threatened ~~for listing~~, as well as other species that would benefit from international cooperation;

5. ~~*Requests* the Scientific Council to review further the proposals submitted by Paraguay during the 16th meeting of the Scientific Council for listing the species *Brycon orbignyanus*, *Salminus hilarii*, *Genidens barbus* and *Zungaro jahu* on the Appendices of the Convention;~~

6. *Calls on* Parties to engage in international cooperation on migratory freshwater fish, which would focus on CMS-listed fish species, at sub-regional or regional levels, noting that this cooperation should, inter alia:
   a. involve governments where appropriate, intergovernmental organizations, non-governmental organizations and local communities;
   b. identify and implement effective measures, as appropriate, to mitigate threats such as habitat degradation, barriers to migration, bycatch and overexploitation; and
   c. identify viable and practical alternatives to uses of endangered migratory freshwater fish while recognizing the cultural and economic importance of these species for some communities, and ensuring that use is sustainable;

6.bis *Requests* Parties to promote the sharing of data with other Range States and/or international bodies on transboundary freshwater migratory fish species, including current abundance, fish ecology and habitat degradation, especially for those species identified on national, regional or global red lists;

6.ter *Further requests* Parties to take actions with respect to hydroelectric and other dams to ~~mitigate~~ compensate the effects of barriers in rivers, such as the creation of protected areas and other effective area-based conservation measures (key habitats such as free flowing rivers) in the upper and lower floodplains that are important for the feeding and spawning cycles of wild migratory fish populations; and

1. *Instructs* the Secretariat to ~~bring this Resolution to the attention of the FAO Committee on Fisheries and the CITES Secretariat, to encourage joint action and to explore future avenues of cooperation with these organizations~~ cooperate with FAO, RAMSAR and CITES as well as with Range States of migratory freshwater fish with a view to enhancing protection, conservation and management of these species.~~; and~~

2. ~~*Further instructs* the Secretariat, resources permitting, to identify relevant international fora that address the conservation of migratory freshwater fish and to organize regional workshops to assess conservation status and recommend priority conservation measures.~~

ANNEX 5

DRAFT DECISIONS

FRESHWATER FISH

Directed to Parties

15.AA Parties are requested to:

a) consider proposing species identified in the *Global Assessment of Migratory Freshwater Fishes* for listing on CMS Appendices at future COPs;

b) consider the vulnerability of freshwater fish when looking at issues relating to linear infrastructure, hydropower dam construction, connectivity, bycatch and illegal take of species; and

c) initiate cooperation instruments for listed species where appropriate, such as Concerted Actions, Species Action Plans (single or multi-species), ~~and~~ MOUs and Initiatives, with clear work plans and technical advisory structures.

Directed to the Scientific Council

15.BB The Scientific Council is requested to, subject to the availability of resources:

a) establish an ~~open-ended~~ expert working group to provide advice on migratory freshwater fishes (status reviews, listings, connectivity guidance and monitoring standards, key habitat identification such as free flowing rivers, effectiveness of fish passage mechanisms as mitigation actions);

b) undertake further work to resolve regional and taxonomic gaps in the *Global Assessment of Migratory Freshwater Fishes* by working with IUCN and the expert group to compile evidence for Not Evaluated, Data Deficient and Least Concern (decreasing trend) species flagged as likely meeting CMS criteria;

c) undertake Green Status (Green List) assessments for CMS-listed freshwater fishes and priority candidates identified in the *Global Assessment of Migratory Freshwater Fishes*;

~~c)~~d) identify free flowing rivers which are key habitats for migratory freshwater fishes that are threatened by future hydropower dam construction;

~~d)~~e) produce a status report summarizing the current conservation status and management progress for Appendix I freshwater fish;

~~e)~~f) commission a global status review of migratory marine bony fish (teleosts), mirroring the freshwater approach, to inform potential cross-realm actions;

~~f)~~g) conduct targeted regional reviews (with expert consultation) in basins and regions with numerous transboundary migrants, especially in Africa where transboundary migrants are under-represented in current analyses and data gaps are likely;

~~g)~~h) engage Lower Mekong, Orinoco, Nile, Okavango, Zambezi basin countries to explore pathways for coordinated management and potential accession/participation in CMS instruments;

~~h)~~i) work closely with the Secretariat on the possibility of developing a dedicated freshwater fishes module for the *Atlas of Animal Migration*;

~~i)~~j) incorporate relevant data into the *Status of the Worlds Migratory Species* report to be developed for the 16th meeting of the Conference of the Parties, and other related CMS communication products; and

~~j)~~k) undertake a gap analysis of activities undertaken by CITES, CBD, RAMSAR, FAO, IUCN and river-basin organizations to identify where CMS adds the most value and to align actions on monitoring, connectivity safeguards and sustainable harvest/trade.

Directed to the Secretariat

15.CC The Secretariat shall, subject to the availability of resources:

a) integrate the needs of freshwater fishes into future CMS work, including Decisions, Resolutions and cross-cutting initiatives on ecological connectivity, energy, climatic change, linear infrastructure and bycatch reduction; and

b) support the Scientific Council with the implementation of Decision 15.BB.