

Global Assessment of Migratory Freshwater Fishes

Pathways for Cooperation for Management of Migratory
Freshwater Fish under the Convention on Migratory Species



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FOREWARD

Migratory species of animals are found on land, in the skies and in fresh and salt-water environments. One of the world's longest, strictly freshwater, migrations takes place within the Amazon basin, where the Dorado Catfish completes an epic life-cycle journey of more than 11,000 kilometers from Andean headwaters to distant estuaries and back, crossing numerous countries and ecosystems. These and other migratory freshwater fishes are not only ecological marvels, but are vital to food security, local economies, and the cultural heritage of many across the globe.

Yet the Dorado Catfish and hundreds of other migratory freshwater fishes around the world are facing dramatic declines, with some on the brink of extinction. Fragmented rivers, pollution, overexploitation, and habitat loss are the greatest threats. With migrations that span international borders, cooperation under the Convention on the Conservation of Migratory Species of Wild Animals (CMS) is vital for their survival.

This *Global Assessment of Migratory Freshwater Fishes* provides an invaluable contribution to support conservation action for such species. It provides the most comprehensive global overview to date, identifying 325 migratory freshwater fish species meeting the criteria of CMS to be listed on its Appendix I, II, or both. A listing on Appendix I provides the strictest protection measures, while a listing on Appendix II enhances international cooperation. The report highlights priority river basins—such as the Amazon, La Plata–Paraná–Paraguay, Danube, Mekong, and Ganges–Brahmaputra–Meghna—where coordinated action can make the greatest difference.

Collaborative conservation approaches under CMS include a wide variety of practical measures, such as species-specific Action Plans, broader Concerted Actions, Memoranda of Understanding, and range-wide initiatives. These instruments support countries' efforts to map, restore and conserve ecological connectivity, align technical standards, and agree on conservation priorities.

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By working together, governments, stakeholders and other actors can secure the future of these extraordinary species, and ensure that migratory freshwater fishes like the dorado catfish continue to thrive in our rivers for generations to come.

Amy Fraenkel

Executive Secretary

Convention on the Conservation of Migratory Species of Wild Animals (CMS)

EXECUTIVE SUMMARY

Migratory freshwater fish sustain food systems, cultures, and extraordinary biodiversity, yet many are declining rapidly. These species are highly susceptible to habitat loss, fragmentation, and overexploitation along their migratory routes, and many move across national boundaries during migration. This brochure summarizes two complementary CMS products: a global review that identifies transboundary migratory freshwater fishes of unfavorable conservation status, and a companion case study focusing on transboundary migratory fish of the Amazon. This document also celebrates recent action to better integrate migratory freshwater fish into CMS activities, including a new Action Plan for Migratory Fish of the Amazon, a freshwater fish listing proposal, and other CMS pathways for coordinated action.

The global assessment represented by these reports identifies **349** migratory, transboundary freshwater fishes that potentially meet CMS Appendix criteria; of which **24** are already listed, leaving **325** candidates for prospective action.

- Migratory freshwater fishes are among the most imperiled vertebrates, with declines driven by connectivity loss, altered flows, habitat degradation, exploitation, pollution, and compounding pressures across borders.
- Candidate occurrences span all regions, reflecting a truly global need and opportunity for cooperation.
- Several basins stand out as high-value for urgent cooperation: **Amazon; La Plata/Paraná; Danube; Himalayan rivers; and the Mekong**, where conservation need is significant and coordinated engagement would be especially valuable.
- The case study in the Amazon confirmed **21** migratory, transboundary species that meet the criteria for Appendix II listing
- CMS Parties and Range States can move from concern to action using a toolbox of instruments: Appendix I/II listings, Concerted Actions, Action Plans, and MOUs—supported by shared monitoring and coordinated management in priority transboundary basins.



Goonch catfish (*Bagarius yarrelli*)

Vital Freshwater Fish Migrations are Collapsing; Hundreds of Species Need Urgent, Coordinated Cross-Border Action

349

transboundary
migratory
freshwater fishes
identified

325

candidates not
yet listed

72

high-readiness
threatened species
already occurring in
≥2 CMS Parties

21

Amazon-basin
candidate species
identified in the
case study

97%

of CMS-listed fish are
threatened with extinction

~90%

decline in CMS-listed fish
since the 1970s

From the broader "State of the World's
Migratory Species" findings



Goonch catfish (*Bagarius yarrelli*)



WHY MIGRATORY FRESHWATER FISH MATTER

The world's great freshwater migrations

Freshwater fish migrations are among the planet's most remarkable natural phenomena: linking headwaters, floodplains, and estuaries through cyclical, predictable movements that sustain fisheries, biodiversity, and ecosystem function. Where rivers cross borders, these migrations also create shared resources and shared responsibilities.

The basins these species call home serve as the primary source of both economic security and food sources for billions of people across the planet. For example, the Mekong basin in Asia produces 15 percent of the world's inland fish catch, making it the largest inland fishery on the planet, worth over \$11 billion per year.

Migratory freshwater fish are uniquely vulnerable because their life cycles depend on connected rivers and seasonal flows. When migration corridors are disrupted, by barriers, altered flow regimes, habitat degradation, overexploitation and bycatch, or pollution, declines can be rapid and recovery becomes far more difficult without coordinated action across jurisdictions. Migratory freshwater fish populations have fallen by 81% in the last 50 years. During the same period, populations of the largest of migrating freshwater fish ("megafish") have crashed by a staggering 94 per cent.

From long-distance South American catfishes and characiform fishes to diadromous eels, shad, and salmonids in shared river-sea systems, the common denominator is the same: these migratory fish need intact corridors and aligned management across borders.



WHAT MAKES A FISH "MIGRATORY" UNDER CMS?

CMS defines a migratory species as one whose members cyclically and predictably cross one or more national jurisdictional boundaries. For freshwater fish, this includes movements within shared transboundary rivers and lakes, or cross border movements between freshwater and marine environments.

Freshwater habitats cover a tiny fraction of the planet's water—but they support an outsized share of biodiversity and human livelihoods. Migratory fish concentrate that value along connected corridors or "swimways".

Connectivity supports freshwater life

Declines in migratory freshwater fish arise from cumulative pressures acting along entire corridors. Connectivity loss and flow alteration can block or delay migrations, reduce floodplain access, and disrupt the timing cues fish use to move and spawn. Habitat degradation, unsustainable harvest and bycatch, pollution, and climate-driven shifts compound these impacts, often across borders, where pressures accumulate from multiple jurisdictions.

- **We don't even know how many fish migrate.** There's no single estimate for the world's ~27,000 known fish species—but migration may be extremely common: some researchers suggest ~50% of Canadian fishes migrate, and up to 70% of fishes in the Mekong River may be migratory.



SWIMWAYS: LIFELINES FOR MIGRATORY FRESHWATER FISH

Swimways are rivers and associated ecosystems that support the entire migration routes of biologically and/or socioeconomically important freshwater species. As development and climate change alters temperature and weather patterns globally, ensuring that these migration routes remain open and supportive of aquatic life is increasingly critical for species survival. Freshwater species like fish and turtles often have only one pathway to move across the landscape – meaning that they must move within the river system. With over 1,000 migratory fish species relying on unimpeded access along their routes, maintaining swimways protections is essential for both ecological integrity and human livelihoods. Without these vital connections, species are unable to reach their breeding, feeding or nursery grounds and risk population declines. The science of identifying and evaluating where the most important swimways exist is still evolving, as our understanding of the migratory pathways of freshwater species is also continuing to expand. Regardless, as 'flyways' have safeguarded avian migration for decades, it's also imperative to extend similar protections to aquatic species. Implementing and evaluating swimways can pave the way for keeping these vital aquatic lifelines open.

Threats to transboundary migratory fish, and solutions that will save them

- Barriers like dams and weirs can affect the movement of aquatic species as they migrate upstream and downstream. Even if fish or other animals overcome a barrier, they likely 1) expend high levels of energy, 2) must swim further to find suitable habitat, 3) spawn in unsuitable habitat (or not at all), likely resulting in low survival of the young, or 4) become injured or die. Barrier removal allows fish to move throughout their entire range and complete their life cycle.
- Changes in the natural flows of the river can be affected by overuse of water resources or by how dams are operated. For example, hydropower plants release water to meet electricity demand, changing the flow of the river and negatively affecting fish and other biodiversity. Strategic planning for energy and water resources can allow for better ecosystem health.
- Changes in the natural flows, as well as river channelization and sand and gravel extraction can cause floodplains to become disconnected from the river. Floodplains provide critically important spawning, feeding and refuge habitat for migratory fish such that disconnection can cause populations to decline. Efforts to restore floodplain connectivity to the river as well as to maintain floodplain and riparian habitats through a variety of protection mechanisms are imperative.
- Overexploitation and bycatch threaten the ability of species to grow to maturity, which is why many nations are developing coordinated fisheries management plans and creating dedicated fish reserves within their basins.
- Excessive pollution (including contaminants that move across borders) contaminates the basins where these species thrive, necessitating improved international best practices to manage water degradation, including point source pollution, plastics and other harmful factors.

International cooperation to identify, protect, and restore key free-flowing river corridors at basin scale is often one of the highest-return actions for migratory fishes.



Migratory fish need basin-scale cooperation

Many of the world's most important rivers and lakes are transboundary. When migratory fish cross borders or occupy shared waters, effective conservation depends on coordination: shared monitoring, compatible management measures, and cooperative instruments that can engage both CMS Parties and non-Party Range States.

CMS – a legally binding international treaty under the United Nations – is designed for exactly this challenge. The Convention offers a structured pathway to identify transboundary migratory fish of unfavorable status, prioritize them for action, and implement cooperation through listings and practical instruments that can align countries, sectors, and partners around a shared workplan.

CMS FRESHWATER FISH IN CONTEXT

CMS Appendices I (listing endangered species requiring strict protection) and II (listing species needing international cooperation) currently include **23 freshwater fish species**:

- the European eel
- three catfishes (including Mekong giant catfish)
- 19 sturgeons and paddlefishes.

CMS is one of the few global tools built specifically to coordinate conservation for species that cross borders. For transboundary migratory fish, CMS offers the solution.

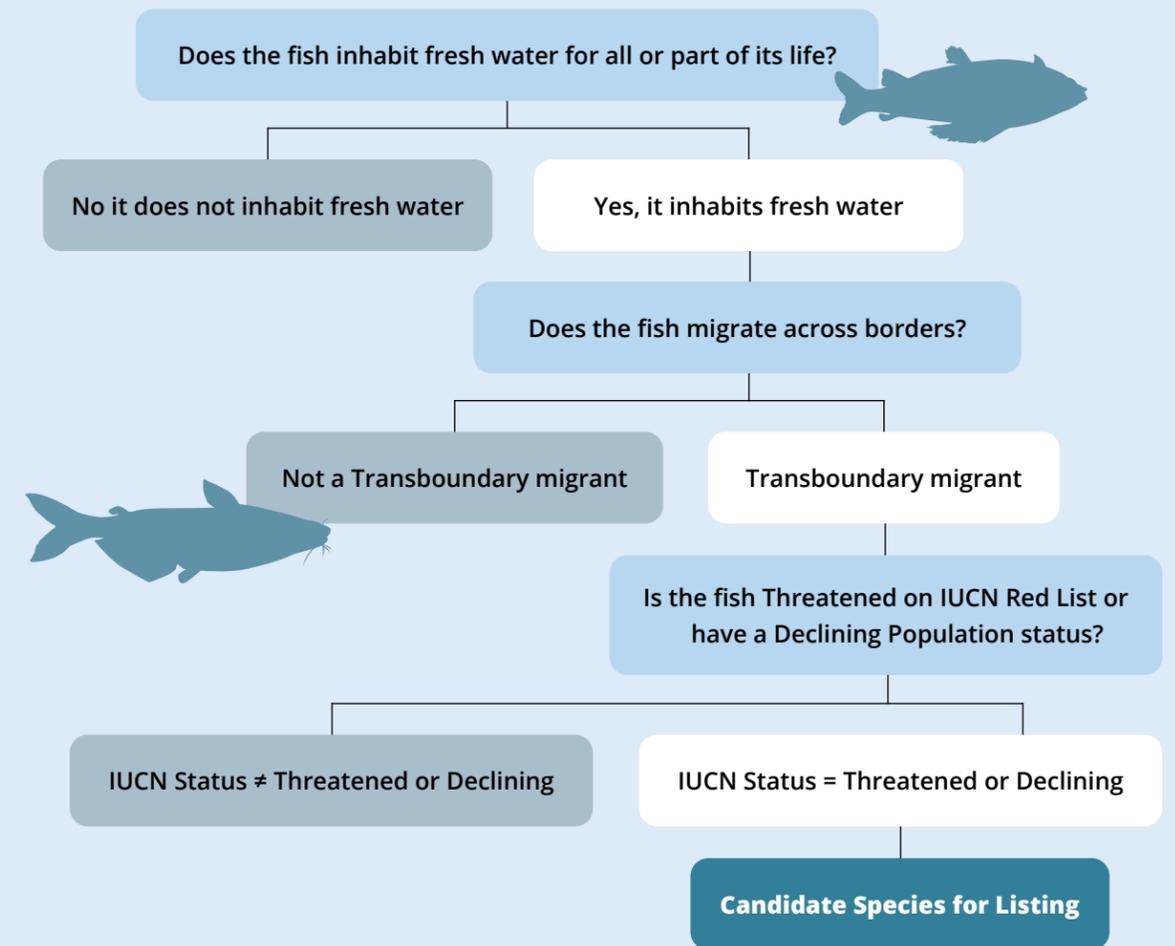


European eel (*Anguilla anguilla*), Hardanger, Norway

A Global assessment of migratory fish

To support practical action, the updated review combines expanded IUCN Red List coverage with a global migratory-fish dataset and additional sources, then applies CMS criteria for transboundary occurrence and unfavorable conservation status.

Assessment:



The result of this assessment is an “action list,” not just a status review so decision-makers can move from evidence to concrete action under CMS.

The Global Assessment Results

- **349** migratory, transboundary freshwater fishes potentially meet CMS Appendix criteria; **325** are not yet listed and represent near-term opportunity for coordinated action.
- **Asia (n=205) stands out** by far with the highest number of migratory freshwater fish that are threatened and cross-borders, followed by South America (55), Europe (50), Africa (42), North America (32), and Oceania (6)—highlighting global relevance across basins and governance contexts.
- River basins with high number of candidates include South America's Amazon and La Plata-Paraná, Europe's Danube, Asia's Mekong and Ganges-Brahmaputra-Meghna, and Africa's Congo, Lake Chad and Nile Basins. Among not-yet-listed taxa, **136** meet CR/EN/VU/NT thresholds; **75** already occur in ≥ 2 CMS Parties—creating a practical near-term pathway for listings where criteria are met.
- Two implementation pathways emerge: (i) regions where action can proceed immediately (≥ 2 Parties present), and (ii) regions where conservation need is high but membership gaps limit CMS tools—calling for parallel engagement with non-Party Range States.

TWO IMPLEMENTATION PATHWAYS

- **High-readiness Species for Action now:** threatened species already occurring in ≥ 2 Parties. Recommended Action: review of list of high-priority species (i.e., those occurring in two or more Parties with CR/EN/VU/NT status) followed by preparation of proposals for species listing on Appendix I and/or II. Once listed, initiate cooperation instruments f- Concerted Actions, Species Action Plans (single or multi-species) and MOUs – with clear workplans and technical advisory structures.
- **High-need, membership-limited contexts:** Where High-readiness Species occur but CMS Party membership is limited explore options for transboundary cooperation in parallel to potential membership in CMS. For example, the Mekong Region has a high number of species with urgent conservation need but limited Party coverage. Recommended Action: Engagement to explore CMS membership while putting in place flexible cooperation mechanisms (e.g., explore potential to leverage Mekong River Commission and other instruments for transboundary cooperation on migratory fishes).



Species in Focus— STURGEONS

Within CMS, the European sturgeon (*Acipenser sturio*) is listed on Appendix I and on Appendix II; eighteen additional sturgeons and the Chinese paddlefish are on Appendix II. The most recent IUCN reassessment identifies *Acipenseriformes* as the most threatened vertebrate group, with the majority of species Critically Endangered (CR) or Endangered (EN) and declining due to river fragmentation, illegal harvest and caviar trade, altered flows and degraded water quality. The Chinese paddlefish (*Psephurus gladius*) was confirmed extinct in 2022 – the first CMS-listed fish lost. Urgent action is critical. High-value cooperative actions include reconnecting rivers via passages and ecologically timed dam operations; intensifying enforcement against illegal caviar with forensic product testing and market surveillance; reducing bycatch through time-area measures, gear modifications and rapid-release protocols; reforming stocking towards conservation hatcheries with genetic safeguards; and strengthening monitoring with population-unit genetics, acoustic or mark-recapture programs and eDNA for rare spawners to inform transboundary management.

Several species of sturgeon are not yet listed but meet the criteria. Among them, the European population of *Acipenser oxyrinchus* is considered Critically Endangered in European waters and possibly extinct in the wild. The species is diadromous and utilizes a multitude of habitats throughout its life cycle. The maximum lifespan is estimated to be 120 – 140 years of age with a maximum size of more than 5 meters and a body mass of more than 600kg and reproduction only beginning after about 20 years of age. Threats include mortality due to accidental catch and poaching; drastic changes of hydrologic regimes in rivers and estuaries and fragmentation of migration routes; pollution; and introduction of other sturgeon. While the European subpopulation has a multi-country Action Plan in place, listing under CMS could support parties' actions in cooperation with the Baltic Marine Environment Protection Commission (HELCOM) who is coordinating the action plan.





Tambaqui (*Colossoma macropomum*)

CASE STUDY

The Amazon basin: Long-distance migrations in a global stronghold

A targeted basin case study approach demonstrates how the global assessment can be refined and strengthened with national threatened species lists and evidence of declines from the scientific literature. This case study provides a practical, region-ready evidence base for CMS listings. In the Amazon Basin assessment, integrating basin literature, national Red Lists, and expert consultation identified **21** migratory species that meet the CMS rationale, spanning long-distance catfishes, migratory characiforms, widely exploited food fishes, and iconic large species.

The candidate set includes long-distance pimelodid catfishes (e.g., *Brachyplatystoma*, *Pseudoplatystoma*), migratory characiforms (e.g., *Brycon*, *Leporinus*, *Prochilodus*, *Semaprochilodus*) and widely exploited serrasalמידs.



THE SCALE OF WHAT'S AT STAKE

In the Amazon, migratory fish underpin fisheries and livelihoods with over 90% of fisheries landings estimated to come from migratory species; in parts of the basin major declines have been reported since 1970 and the economic importance of migratory fish is upwards of \$436 M/year. Migratory fish in the Amazon form an important part of the bio-cultural fabric of many indigenous peoples' lives, traditions, world views/ cosmologies, and narratives.



Tiger shovelnose catfish (*Pseudoplatystoma fasciatum*)

High Need Species Groups

Large migratory Pimelodid catfishes

This group includes transboundary species in the La Plata and Amazon Basins, which undertake seasonal, basin-scale movements linking upstream spawning locations to floodplain nurseries, with widespread decline or local extirpation indicating unfavorable status in parts of their ranges. Recommended actions include cross-border stock assessment, fishing regulation, maintenance or restoration of free-flowing corridors for migration, fish passage performance standards, environmental flows for larval drift and protection of floodplain nurseries.

Large migratory Characids and serrasalmids (*Brycon*, *Salminus*, *Piaractus*; *Prochilodus* and *Semaprochilodus*; families *Characidae*, *Serrasalminidae*, *Prochilodontidae*)

These taxa form transboundary populations that execute long pre-spawning and spawning migrations, with pronounced declines indicating unfavorable conditions in multiple river reaches. Where multiple Parties share stocks, Appendix II measures can formalize seasonal closures on upriver runs, genetic stock identification and monitoring, maintenance or restoration of free-flowing corridors for migration fish passage measures, and re-operation of hydropower to restore flood pulses.

Pangasiid catfish of mainland Southeast Asia, including the Mekong (*Pangasius*, *Pangasianodon*; family *Pangasiidae*)

These species maintain shared stocks across national boundaries and show pronounced declines in portions of their ranges, meeting both migratory and unfavorable criteria in several cases. While *Pangasianodon gigas* is already listed on Appendix I, related pangasiids in the list satisfy threat and transboundary criteria and occur in Party jurisdictions, enabling Appendix II measures for shared monitoring, protection of spawning reaches, bycatch reduction in barrage and bagnet fisheries, and flow management to preserve larval drift windows. Where membership gaps exist, river commission frameworks can advance these actions pending accession.

Mekong megacarpus (*Probarbus*, *Catlocarpio*; family *Cyprinidae*)

These long-lived cyprinids form shared main-stem stocks that aggregate to spawn in deep pools and disperse widely with the flood pulse, a transboundary dynamic that renders them highly susceptible to targeted fisheries, river fragmentation, and hydrological alteration across national borders. Where multiple Parties overlap, Appendix II measures can formalize deep-pool sanctuaries, seasonal closures at known spawning sites, and adaptive flow coordination. In non-Party stretches, similar measures can be advanced through sub-regional agreements while accession proceeds.

Salmonids of the temperate Northern Hemisphere (*Salmo*, *Hucho*, *Salvelinus*, *Coregonus*; family *Salmonidae*)

These species include transboundary freshwater migrants with documented declines across multiple jurisdictions, indicating unfavorable status in several populations. Appendix II measures could potentially include thermal refugia, dam removal, gravel-spawning habitat, and cumulative hydropower effects that operate across boundaries.

Anguillid eels (*Anguilla*; family *Anguillidae*)

These catadromous fishes link inland waters across multiple jurisdictions to oceanic spawning areas, creating inherently transboundary stocks that meet the migratory criterion and face unfavorable conditions in many places due to passage barriers, turbine mortality, exploitation of juvenile and adult stages, and changing ocean conditions. Because many ranges already include at least two Parties, coordinated Appendix II action can align inland passage standards, regulate life-stage-specific fisheries, and harmonize recruitment and escapement monitoring across countries, including Small Island States in Oceania where connectivity spans multiple sovereignties.

Clupeid shads in the subfamily Alosinae (*Alosa*, *Tenulosa*; family *Clupeidae*)

These anadromous migrants form shared estuary–river stocks and undertake seasonal runs into transboundary systems, with hilsa shad serving as a prominent example in South Asia, thereby meeting the migratory and shared-stock criteria and showing unfavorable conditions where exploitation and flow alteration are intense. In shared Party waters, Appendix II approaches can harmonize seasonal closures, mesh regulation and environmental-flow management to protect upriver spawning tributaries and estuarine nursery conditions.

Mahseer and allied mountain cyprinids (*Tor*, *Neolissochilus*, *Naziritor*; family *Cyprinidae*)

These riverine fishes execute upstream migrations from larger main stems into headwater tributaries to spawn and return downstream to feeding habitats, forming transboundary stocks across the Himalayan region and experiencing multiple pressures that indicate unfavorable status in portions of their ranges. Where two or more Parties share stocks, Appendix II measures can set performance targets for passage, protect free-flowing migratory corridors and spawning tributaries, coordinate dry-season environmental flows and regulate harvest of pre-spawning adults. In non-Party reaches, transboundary river agreements can advance similar measures pending accession.

Mulletts, barbels, snowtrout, gobies, stingrays

Mulletts are amphidromous migrants that link coastal and riverine habitats and form shared stocks across estuaries, implying benefits from coordinated management of tidal barrages and coastal–river connectivity where Parties overlap.

Sturgeon

While the majority of freshwater fish currently listed on CMS are sturgeon (19/23), all of the species currently listed on Appendix II qualify for Appendix I. Additionally, there are three species of sturgeon that qualify for listing that are not currently on either appendix. These are *Acipenser brevirostrum*, *A. oxyrinchus* and *A. transmontanus*. See Box YY for a special focus on Baltic sturgeon.

Emblematic Species Ready for Listing

Emblematic Species across regions and groups, Ready for listing on the CMS Appendices*

SPECIES	SUMMARY (DISTRIBUTION, IUCN STATUS, MIGRATORY AND OPPORTUNITIES FOR COOPERATION)
<i>Alosa alosa</i> (Allis shad)	<p>Tagline: <i>A collapsed European migratory fish that epitomizes lost connectivity.</i></p> <p>Countries: Portugal, Spain, France, Ireland, United Kingdom, Belgium, Netherlands, Germany, Denmark, Norway.</p> <p>IUCN: Least Concern globally (strong regional declines).</p> <p>Migratory: Anadromous adult runs from coastal waters into shared rivers; juveniles rear in estuaries and lower rivers.</p> <p>Cooperation: coordinate fish-pass retrofits at estuary and barrage nodes, harmonize spawning-season closures, and share juvenile monitoring across Parties.</p>
<i>Acipenser oxyrinchus</i> (Baltic and North Sea)	<p>Tagline: <i>Critically endangered Baltic sturgeon.</i></p> <p>Countries (Baltic & North Sea context): Denmark, Germany (incl. Elbe drainage/ North Sea), Poland, Sweden, Finland, Estonia, Latvia, Lithuania, Russia; occasional records from Great Britain/North Sea.</p> <p>IUCN: Vulnerable.</p> <p>Migratory: Anadromous—feeds in marine/brackish waters, migrates into large rivers to spawn; strong homing and needs unobstructed river access.</p> <p>Cooperation: coordinate basin-scale reintroduction/restocking strategies (shared broodstock standards, genetics, marking), restore/secure passage at key barriers in North Sea–draining rivers, reduce bycatch in coastal fisheries, and harmonize monitoring (telemetry, eDNA/juvenile surveys) across Baltic/North Sea Parties. (Baltic populations are considered extirpated/regionally extinct, making coordinated reintroduction especially relevant.)</p>
<i>Anguilla mossambica</i> (African longfin eel)	<p>Tagline: <i>A catadromous eel linking African rivers to the Indian Ocean.</i></p> <p>Countries: South Africa, Eswatini, Mozambique, Tanzania, Kenya; Madagascar, Comoros, Mauritius, Réunion, Seychelles.</p> <p>IUCN: Near Threatened (2018).</p> <p>Migratory: Catadromous with oceanic spawning; recruitment and silver eel escapement are transboundary.</p> <p>Cooperation: regional eel-passage standards and coordinated recruitment/ escapement monitoring across multiple small jurisdictions.</p>

SPECIES	SUMMARY (DISTRIBUTION, IUCN STATUS, MIGRATORY AND OPPORTUNITIES FOR COOPERATION)
<i>Anguilla rostrata</i> (American eel)	<p>Tagline: <i>Endangered migratory eel linking Latin, Central and North American rivers to the sea.</i></p> <p>Countries: Canada, United States, Mexico, Bahamas, Cuba, Jamaica, Dominican Republic, Haiti, Trinidad and Tobago, Guatemala, Belize, Honduras, Nicaragua, Costa Rica, Panama, Colombia, Venezuela, Guyana, Suriname.</p> <p>IUCN: Endangered (2020).</p> <p>Migratory: Catadromous with oceanic spawning in the Sargasso Sea and shared recruitment; silver eel escapement is cross-jurisdictional.</p> <p>Cooperation: shared recruitment indices, coordinated glass-eel harvest rules, and turbine-mortality mitigation.</p>
<i>Aspiolucius esocinus</i> (Pike asp)	<p>Tagline: <i>A disappearing Central Asian predator—flagship for Amu Darya & Syr Darya connectivity.</i></p> <p>Countries: Uzbekistan, Turkmenistan, Tajikistan, Kazakhstan, Afghanistan, Kyrgyzstan.</p> <p>IUCN: Endangered (2020).</p> <p>Migratory: Large-river migrant sensitive to regulation and abstraction.</p> <p>Cooperation: coordinated environmental-flow releases and protection of migration corridors across riparian Parties.</p>
<i>Bagarius yarrelli</i> (Goonch)	<p>Tagline: <i>Large bodied catfish migrating across Asian rivers.</i></p> <p>Countries: India, Nepal, Bangladesh, Pakistan, Myanmar, Thailand, Lao People's Democratic Republic, Cambodia, Viet Nam.</p> <p>IUCN: Vulnerable (2022).</p> <p>Migratory: Large predatory catfish of rapids and deep runs; sensitive to flow alteration and harvest.</p> <p>Cooperation: harmonized harvest rules and environmental-flow standards on shared main stems.</p>
<i>Brachyplatystoma capapretum</i>	<p>Tagline: <i>Migratory catfish of the Amazon.</i></p> <p>Countries: Brazil, Peru (Amazon mainstem from Belém upriver to at least Iquitos; also major tributaries).</p> <p>IUCN: Near Threatened.</p> <p>Migratory: Potamodromous within the Amazon; juveniles/subadults are migratory and the species uses long, connected mainstem/tributary corridors.</p> <p>Cooperation: coordinate cross-border fisheries rules (size/season protections), protect/restore mainstem migration corridors (esp. around dredging/port and hydropower planning), and standardize monitoring of landings and juvenile occurrence between Parties.</p>

SPECIES	SUMMARY (DISTRIBUTION, IUCN STATUS, MIGRATORY AND OPPORTUNITIES FOR COOPERATION)
<i>Brachyplatystoma filamentosum</i> (Piraíba)	<p>Tagline: <i>Migratory catfish of the Amazon emblematic of long distance migrants in the basin.</i></p> <p>Countries: Amazon–Orinoco–Guianas.</p> <p>IUCN: per database.</p> <p>Migratory: Iconic long-distance siluriform moving thousands of km river-to-estuary.</p> <p>Cooperation: basin-scale connectivity strategy; bycatch controls in mixed fisheries; protect migration bottlenecks.</p>
<i>Brycon orbignyanus</i> (Sábalo / Piracanjuba)	<p>Tagline: <i>An endangered La Plata basin long-distance migrant—flagship for dam-fragmented South American rivers.</i></p> <p>Countries: Argentina, Uruguay, Paraguay, Brazil, Bolivia.</p> <p>IUCN: Endangered (2020).</p> <p>Migratory: Long-distance potamodromous characin linking spawning reaches and floodplain nurseries; dams and fishing pressure have driven declines.</p> <p>Cooperation: basin-wide seasonal closures, high-gain fish-pass retrofits, and floodplain nursery protections among Parties.</p>
<i>Colossoma macropomum</i>	<p>Tagline: <i>South American large-bodied fruit and seed eating migrant vulnerable to overfishing.</i></p> <p>Countries: Bolivia, Brazil, Colombia, Ecuador, Paraguay, Peru, Venezuela (native Amazon & Orinoco basins; widely moved via aquaculture).</p> <p>IUCN: Near Threatened.</p> <p>Migratory: Seasonal flood-pulse movements linking river channels to floodplains/flooded forests; adults shift habitats and migrate upstream to spawn at the start of new floods.</p> <p>Cooperation: harmonize closed seasons during spawning/flood onset, align minimum-size/gear rules across shared basins, coordinate floodplain habitat protection (key feeding areas), and share data/standards on aquaculture escapes and genetic/stock impacts.</p>
<i>Hucho hucho</i> (Huchen)	<p>Tagline: <i>A Danube-basin apex salmonid whose survival depends on cross-border free-flowing rivers.</i></p> <p>Countries: Austria, Slovenia, Croatia, Bosnia and Herzegovina, Serbia, Romania.</p> <p>IUCN: Endangered.</p> <p>Migratory: Potamodromous migrations between holding, feeding and spawning reaches in the Danube system; highly barrier-sensitive.</p> <p>Cooperation: joint prioritization of barrier retrofits, sediment/gravel continuity restoration, and standardized run-timing monitoring among Danube Parties.</p>

SPECIES	SUMMARY (DISTRIBUTION, IUCN STATUS, MIGRATORY AND OPPORTUNITIES FOR COOPERATION)
<i>Hucho taimen</i> (Taimen)	<p>Tagline: <i>The world's largest salmonid—an apex flagship for intact northern rivers.</i></p> <p>Countries: Russia; Mongolia; China; Kazakhstan.</p> <p>Migratory: ~20–100 km typical; maxima ~90+ km home range reported (river-network scale)</p> <p>Cooperation:</p>
<i>Lampetra fluviatilis</i> (River lamprey)	<p>Tagline: <i>A European jaw-less fish that needs access from river to sea to thrive.</i></p> <p>Countries: Norway, Sweden, Finland, Estonia, Latvia, Lithuania, Poland, Germany, Denmark, Netherlands, Belgium, United Kingdom, Ireland, France, Italy.</p> <p>IUCN: Near Threatened (regional assessments).</p> <p>Migratory: Anadromous, moving between coastal waters and rivers to spawn; barrier- and bycatch-sensitive.</p> <p>Cooperation: standardize small-barrier retrofits on tributaries and align estuarine bycatch controls.</p>
<i>Pangasius sanitwongsei</i> (Giant pangasius)	<p>Tagline: <i>A massive migratory catfish surviving in fragments of its former range.</i></p> <p>Countries: Lower Mekong basin (Thailand–Lao PDR–Cambodia) and Chao Phraya.</p> <p>IUCN: Critically Endangered. Migratory: Long-distance potamodromous.</p> <p>Cooperation: cross-border seasonal closures; protect spawning aggregation sites; retrofit key main-stem barriers; coordinated enforcement against illegal harvest.</p>
<i>Probarbus jullieni</i> (Jullien's golden carp)	<p>Tagline: <i>A Mekong megacarp that concentrates to spawn—making protection practical and urgent.</i></p> <p>Countries: Cambodia, Lao People's Democratic Republic, Thailand, Viet Nam (historically Malaysia).</p> <p>IUCN: Critically Endangered (2019).</p> <p>Migratory: Very large potamodromous spawner with seasonal main-stem aggregations; vulnerable to fishing and hydropeaking.</p> <p>Cooperation: transboundary seasonal closures at known aggregation sites and joint monitoring through regional river-basin bodies.</p>
<i>Salmo salar</i> (Atlantic salmon)	<p>Tagline: <i>The original 'swimway icon'—from gravel redds to ocean feeding grounds and back.</i></p> <p>Countries: Canada, United States (Maine), Iceland, Norway, United Kingdom, Ireland, France, Spain, Portugal.</p> <p>IUCN: Near Threatened (2023).</p> <p>Migratory: Anadromous with extensive marine migrations and natal homing; mixed-stock fisheries and dams complicate management.</p> <p>Cooperation: align mixed-stock management and accelerate fish-pass upgrades on shared rivers.</p>

SPECIES	SUMMARY (DISTRIBUTION, IUCN STATUS, MIGRATORY AND OPPORTUNITIES FOR COOPERATION)
<i>Steindachneridion scriptum</i> (Surubim-do-Iguaçu)	<p>Tagline: <i>A giant catfish of the Iguaçu threatened with extinction.</i></p> <p>Countries: Brazil, Paraguay, Argentina, Uruguay.</p> <p>IUCN: Endangered (2023).</p> <p>Migratory: Large migratory pimelodid with movements along main stems; dams fragment spawning–nursery connectivity.</p> <p>Cooperation: joint barrier-retrofit priorities and floodplain nursery protections across borders.</p>
<i>Tenualosa ilisha</i> (Hilsa shad)	<p>Tagline: <i>The 'king of fish' of South Asia—an enormous fishery tied to river flows.</i></p> <p>Countries: Bay of Bengal (India–Bangladesh–Myanmar; Pakistan via Indus).</p> <p>IUCN: per database.</p> <p>Migratory: Anadromous clupeid with transboundary river–delta runs.</p> <p>Cooperation: coordinated seasonal closures, gear/mesh harmonization and escapement targets across Parties.</p>
<i>Tor putitora</i> (Golden mahseer)	<p>Tagline: <i>The Himalayan 'tiger of the river'—a flagship for mountain swimways.</i></p> <p>Countries: Afghanistan, Pakistan, India, Nepal, Bhutan, Bangladesh (records also from Myanmar and Thailand).</p> <p>IUCN: Endangered.</p> <p>Migratory: Long pre-monsoon migrations from main rivers to headwater spawning sites; dams and harvest drive declines.</p> <p>Cooperation: cross-border seasonal closures, tributary sanctuaries, and coordinated environmental-flow releases.</p>
<i>Zungaro jahu</i> (Jau)	<p>Tagline: <i>A giant La Plata basin catfish whose spawning success depends on long, connected river corridors.</i></p> <p>Countries: Upper Paraná/Paraguay–Paraná.</p> <p>IUCN: NT.</p> <p>Migratory: Long-distance potamodromous catfish reliant on floodplain nurseries.</p> <p>Cooperation: transboundary passage retrofits; environmental-flow/peaking rules; sanctuaries at known spawning reaches.</p>

** Emblematic list is illustrative, including representative from all continents. See full list in the assessment report: https://www.cms.int/sites/default/files/document/2026-01/cms_cop15_doc.25.6.1_rev.1_fresh-water-fish_e.pdf

Enabling Conditions for Success

Across basins and species groups, success depends on shared baselines and indicators; improved knowledge of migration routes and stock structure; maintaining or restoring connectivity and environmental flows; reducing habitat degradation and pollution; and inclusive governance with data sharing across sectors and jurisdictions.



CMS can help make these components consistent across borders, so gains upstream are not lost downstream.

FOUNDATIONS FOR COOPERATIVE MANAGEMENT

- Shared monitoring protocols
- Corridor and bottleneck identification
- Compatible fisheries measures along migration routes
- Maintain or restore ecological connectivity
- Environmental flows aligned to migration and larval drift

Atlantic salmon (*Salmo salar*), North Wales, UK

Pathways Forward

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), 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.

A Shared Opportunity to Restore Migrations

Migratory freshwater fish connect ecosystems, economies, and cultures—and their declines reflect shared pressures across entire river corridors. This assessment provides a practical foundation for cooperation: identifying priority transboundary species of unfavorable status and outlining CMS instruments that can align countries and partners around measurable outcomes.

CMS can build momentum through additional listings where criteria are met; stronger participation by Range States in priority basins; targeted regional attention where migratory fishes remain under-assessed or under-protected; and integration of freshwater fish into wider CMS work on connectivity and infrastructure. The opportunity is to match the scale of freshwater migrations with cooperation at the same scale.

If we get this right, cooperation among countries to manage and protect migratory fishes, and the river connectivity and habitats they depend on, can halt extinctions now underway and begin reversing declines across entire river systems. It can keep the most imperiled species from disappearing, rebuild historic runs that are central to the identity, food security, and livelihoods of people living along rivers, and sustain fisheries that collectively produce millions of tons of fish each year and provide essential nutrition for hundreds of millions of people. It can also restore the ecological functions that migrations deliver, moving energy and nutrients through floodplains and deltas, supporting birds, mammals, and other wildlife, and maintaining the resilience of freshwater ecosystems under climate and development pressure. In practical terms, it means rivers where fish once again move in abundance across borders, linking headwaters to deltas, connecting countries through shared stewardship, and bringing aquatic life back to water in ways that benefit both people and nature.



