

Guide for Coordinated Implementation of Policies in the European Union for the Conservation of Freshwater Biodiversity

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Foreword

The fact we are facing a biodiversity crisis globally is a well-established statement, and that our freshwater systems are bearing the brunt and seeing the most dramatic decline of all ecosystems, especially in Europe. Therefore, this decade will be critical on many fronts as a turning point for the long-term health and functioning of our natural environment, which the UN Decade of Restoration (2021-2030) captures well in its 'global rallying call to heal our planet'.

There are a significant number of Multilateral Environment Agreements (MEAs) which countries in Europe, but also countries globally are party to, which look to tackle the issues related to biodiversity decline by restoration and protection of natural habitats. The most important, overarching such framework is the Convention on Biological Diversity (CBD). The Conference of Parties (COP15) will negotiate and hopefully endorse a comprehensive, new Global Biodiversity Framework for the decade. In Europe, the Green Deal, the 2030 EU Biodiversity Strategy and the subsequently proposed Nature Restoration Law (2022) are giving direction for the 27 EU Member States to put nature on the track of recovery – within that the 30X30 protection target, with a basis in existing legal frameworks and directives.

Comprehensive planning and implementation is often associated with financial, technical, knowledge and administrative hurdles, not to mention the level of staff resources in governments and national competent authorities on the receiving end of the decisions and obligations coming out of the global and local policy processes. Countries are signatory Parties to a great number of MEAs as well as in Europe they are also bound by the EU frameworks. However, there seems to be still a compartmentalisation, in which the various MEAs and other frameworks are dealt with individually. However, many issues are cross-cutting, a critical example is freshwater, which is taken up from many perspectives in many MEAs.

Thus, when a Country is embarking to build a comprehensive strategy for protecting and restoring freshwater ecosystems, it is important to be aware of the obligations, guidance provided by all MEAs the country is Party to. This will help on the one hand to have a truly holistic plan, and on the other hand streamline implementation resources use and reporting. Once the CBD COP has endorsed the new GBF, Parties will be required to review and update their National Biodiversity Strategies and Action Plans.

This is where guidance on planning and implementation on MEAs benefits all who are involved in the process and is an important steppingstone to get the natural environment where it needs to be in 10 years, and beyond.

For Europe, this paper is meant to act as a tool to comprehensively view the requirements and obligations, targets, and goals for Freshwater Ecosystems derived from the aforementioned MEAs, strategies and policies that are relevant to European Union Member States, and of course those looking to join the Union. The utility of this tool also goes beyond European borders, and is adaptable in its coverage, as many of the conventions listed are global in scope and relevancy.

Freshwater systems need to receive more focused attention that is also well-deserved, because of their critical supportive role for both terrestrial and marine systems respectively, and also in their own right as the complex, multi-use ecosystems which they are.

The hope is that this paper can help to start and support a focused yet comprehensive, cooperative approach, and put us Europe on track for a **Decade of Restoration that is truly inclusive of our rivers, lakes and wetlands.**



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Part I: Review of policy components

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Introduction

Freshwater biodiversity has declined at an alarming rate around the world, and strategies are urgently needed to stop and ultimately reverse this decline. Laws and regulations establishing rules for the protection, management, and use of freshwater, freshwater ecosystems, and the species that inhabit them, collectively referred to here as ‘freshwater resources’, are an essential mechanism in addressing the freshwater biodiversity crisis. Yet it is rare that a country (or another political jurisdiction) would have a policy instrument singularly targeted at conserving freshwater biodiversity. Instead, a collection of policies is the norm, where each is relevant to some aspect of freshwater resources while having other more general overall goals (e.g., all biodiversity, or all uses of freshwater). These, often-numerous, policies can be overlapping in intent and may have complementary components, thus implementation, if done one by one, can be inefficient.

The goal of this project is to create a guide that groups together common elements from the collection of freshwater biodiversity-related policies, resulting in a more efficient and holistic pathway for policy implementation. We do this by dissecting a suite of European Union policies that each address some aspect of freshwater biodiversity conservation into their various components, then looking at those components for common elements across policies where efficiencies could be achieved. For example, most policies call for monitoring plans, and coordinating monitoring into one plan would be more efficient and cost-effective in contrast to the current often disjointed implementation.

The policies included in this analysis cover the five recognized key ecological attributes (KEA) for freshwater biodiversity conservation (Higgins et al. 2021)¹ and are listed under their corresponding KEA in Table 1. According to Higgins et al., *Key Ecological Attributes (KEAs) are fundamental characteristics of ecosystems that are essential for the long-term persistence of native biodiversity values and are critical for designing and evaluating protection actions, [as well as] social values derived from naturally functioning freshwater ecosystems*".

Table 1. Freshwater key ecological attributes *directly and explicitly* addressed by the individual policy instruments evaluated for this implementation guide.

Policy instrument	hydrologic regime	connectivity	habitat	water quality	Biotic composition
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¹ Higgins, J.; Zablocki, J.; Newsock, A.; Krolopp, A.; Tabas, P.; Salama, M. Durable Freshwater Protection: A framework for establishing and maintaining long-term protection for freshwater ecosystems and the values they sustain. Sustainability 2021, 13, 1950. <https://doi.org/10.3390/su13041950>

UN Convention on Biological Diversity		✓	✓	✓	✓
Water Framework Directive	✓	✓	✓	✓	
2030 Biodiversity Strategy	✓	✓	✓	✓	✓
Habitats and Birds Directives (including the Natura 2000 network)		✓	✓		✓
Ramsar Convention	✓	✓	✓	✓	✓
Convention on Migratory Species		✓	✓	✓	✓
Floods Directive	✓	✓	✓	✓	
Convention on the Protection and Use of Transboundary Water Courses and International Lakes	✓	✓	✓	✓	
Recovery Plan for the European Eel		✓	✓		✓
Pan European Action Plan for Sturgeon	✓	✓	✓	✓	✓

Each policy was reviewed for a suite of common implementation actions, and the relevant articles calling for each of those actions is listed under each policy below. These actions are grouped into five categories:

- **Assessments.** Includes risk and impact assessments, and indicators related to reporting.
- **Legislative measures and national policies.**
- **Protection.** Includes establishment of protected areas such as the Natura 2000 network, ex situ species conservation, conserving genetic diversity, protection of carbon stocks, and enforcement of protected area rules and boundaries.
- **Sustainable use of biodiversity.** Includes wild species management (e.g., fisheries, waterfowl), control of exotic invasive species, and takings management.
- **Management plan implementation.** Includes river basin management plans, water use management, pollution control and management, land management with freshwater objectives, integrated resource management, and ensuring ecological connectivity of protected areas through management of multi-use areas that connect areas with stricter protection.
- **Compensatory mitigation.** Includes mechanisms for compensating or mitigating for species or habitat losses when the loss is deemed unavoidable due to competing human needs (e.g., creation or restoration of a comparable habitat in another location).
- **Economic instruments.** Includes measures related to how the policy will be financed.
- **Communication.** Includes education, public awareness.
- **Cooperation.** Includes cooperation across sectors, with stakeholders, and across borders.

Name of Policy: Water Framework Directive (2000)

Policy instrument	hydrologic regime	connectivity	habitat	water quality	Biotic composition
Water Framework Directive	✓	✓	✓	✓	

This section includes only the main directive document, the [Common Implementation Strategy guidance documents](#) can be found on the European Commissions website, for more details and guidance regarding implementation aspects relative to the measures, reporting, monitoring and articles of the Directive listed in this section.

Purpose of Directive

Citizens, environmental organisations, nature, and water-using sectors in the economy all need cleaner rivers and lakes, groundwater, and bathing waters. Water protection is therefore one of the priorities of the Commission. The Water Framework Directive has the following key aims:

- expanding the scope of water protection to all waters, surface waters and groundwater
- achieving "good status" for all waters by a set deadline
- water management based on river basins
- "combined approach" of emission limit values and quality standards
- getting the prices right
- getting the citizen involved more closely
- streamlining legislation
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Assessments

1. Risk assessment
2. Impact assessment

(Article 5) Development of **River Basin Management Plan** (RBMP) by member states for all basins within its borders. Member States (MSs) must also collaborate on transboundary basin plans. First part of RBMPs is an Assessment, which includes:

- a) characteristics of the basin
- b) impacts of human activities on Surface Waters and Ground Waters
- c) economic analysis of water use ([Annex III](#))
- d) Register of protected areas

3. Identification / definition, reporting and indicators

(Article 5) Basin characterisation includes detailed information about freshwater **ecosystem type** and characteristics; the systems typology can be used as a proxy for species.

Legislative measures and national policies

1. National strategies

(Article 5) MSs must develop **RBMP** at least to their borders.

2. Programs

(Article 11) Programmes of **measures** may reference measures following from legislation adopted at national level and covering the whole of the territory (see also Programs).

- a) (Annex VI) Is a list of Measures, and Part A includes existing directives (e.g., Drinking Water Directive, Birds Directive). Program of measures to control **water quantity and quality impacts**, such as controls over abstraction, impoundment, point and non-point source pollutant discharges, and artificial groundwater recharge. Also references Annex VI, part B, where supplementary measures includes recreation or restoration of wetland areas.
- b) (Annex VI) Is a list of **Measures**, Part B includes supplementary measures each Member State may choose to adopt (e.g., legislative instruments, administrative instruments).

3. Actions

Regular reporting in the RBMP on planned steps towards implementing measures, and on contribution made by various water uses to the recovery of costs of water services.

Management

1. Protection

(Article 6, Annex IV) Establishment of **register of all areas** designated for either:

- a) Protection of surface water/groundwater for human consumption
- b) Conservation of economically important aquatic species
- c) Conservation of water bodies important for recreation
- d) Nutrient sensitive areas

Areas designated for the protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant Natura 2000 sites or habitats.

2. Sustainable use of biodiversity
3. Management plan implementation
4. Compensatory mitigation
5. Rehabilitation and restoration

(Article 11, Annex VII part B) Wetland recreation and restoration are listed as possible **measures**

6. Monitoring

(Article 8, Annex V) **A monitoring** program is part of RBMP, required to evaluate progress on water quality, quantity, and ecological objectives at frequencies listed in Annex V. Includes these elements:

- Surface water
 - Water quality for classification of ecological status in rivers, lakes, transitional waters, coastal waters, and artificial waters (note that quality elements include hydrologic variables, e.g., quantity and dynamics of flow, connection to groundwater bodies, morphology etc)
 - Chemical status
- Groundwater
 - Quantitative status
 - Chemical status

note that bodies of water to be monitored are only those with discharge at >100m³/day on average, thus possibly excluding smaller, low discharge aquatic systems (small springs, peatlands)

7. Other non-legislative approaches

(Article 14) [regular public consultation](#)

Economic instruments (support for implementation)

1. Incentives

(Article 9) Water **pricing** policies need to provide adequate incentives for users to use water resources efficiently.

(Annex XI part B) Related to incentives: measures related to **agricultural** water use, including demand management (e.g., promotion of water efficient crops in water stressed areas), efficiency (e.g., water efficient technologies to reduce consumption), and abstraction controls.

2. PES schemes

3. Grants

4. State aid

5. Private sector payment

(Article 9 and Annex III) Member States shall take account of the principle of **recovery of the costs** of water services, including environmental and resource costs, having regard to the economic analysis conducted according to Annex III, and in accordance in particular with the polluter pays principle.

(Article 9) “**Polluter pays**” principle: costs associated with water programs are distributed among water users (industry, household, agriculture).

(Article 9) Determination of the most **cost-effective** measures to achieve goals.

6. Foreign grants, programs (e.g.EU)

7. Capacity building

Communication, education and public awareness: including training

(Art 11, Annex VII part B) Possible **measures** include Education, R&D and demonstration projects.

(Article 14, point 1) The Member States shall encourage the active involvement of all **interested parties** in the implementation of this Directive, in particular in the production, review and updating of the river basin management plans.

Cooperation

1. Coordination across sectors

2. Coordination with stakeholders (including IPLCs)

3. Cross-border cooperation

Development of RBMP collaboratively among MS within a river basin.

Name of Policy: UN Convention on Biological Diversity (1992)

Policy instrument	hydrologic regime	connectivity	habitat	water quality	Biotic composition
UN Convention on Biological Diversity		✓	✓	✓	✓

Includes main 1992 text and the Strategic Plan for Biodiversity 2011-2020 and Aichi Biodiversity Targets

*Note that this does not include the programmes of work and initiatives (<http://www.cbd.int/programmes/>)
Contracting parties = CPs*

Purpose of Convention

The Convention on Biological Diversity (CBD) entered into force on 29 December 1993. It has 3 main objectives:

- The conservation of biological diversity
- The sustainable use of the components of biological diversity
- The fair and equitable sharing of the benefits arising out of the utilization of genetic resources

Assessments

1. Risk assessment
2. Impact assessment

(Article 14) Contracting parties have to introduce impact assessment procedures for proposed projects that may have adverse impacts on biodiversity, account for negative consequences of programmes and policies.

3. Identification / definition, reporting and indicators

(Article 25) Establishes the **Subsidiary Body on Scientific, Technical, and Technological Advice**, which is responsible for scientific and technical assessments of the status of biodiversity, the effects of measures, technology identification, providing advice on programs, etc.

(Point 3b,c of 2011-2020 Stra. Plan) Parties to **report** back on plans and targets at 11th or 12th COP.

(Point 13 2011-2020 Stra. Plan) Global Biodiversity **Outlook** to provide review of progress towards Aichi targets.

(Annex section V, point 14, 2011-2020 Str Plan)

Legislative measures and national policies

1. National strategies

(Article 6) Contracting Parties to develop national strategies, **plans**, or programmes for conservation and sustainable use of biodiversity. Can be either new plans or adapt existing ones, and also integrate into existing cross-sectoral plans, programmes and policies.

(Article 8) CPs to develop or maintain necessary **legislation/regulations**.

(Point 3b,c of 2011-2020 Stra. Plan) Parties need to develop national and regional **targets** to update/revise their national biodiversity strategies based on Strategic Plan and Aichi Targets.

(Point 3d of 2011-2020 Stra. Plan) Parties to incorporate biodiversity targets into national development and **poverty reduction** policies and strategies, national accounting, economic sectors and spatial planning processes.

(Aichi Target 2) Biodiversity values have been integrated into national and local development and **poverty reduction** strategies and planning processes and are being incorporated into national accounting and reporting systems.

(Aichi Target 17) Each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity **strategy** and action plan.

2. Programs
3. Actions

Management

1. Protection

(Article 8) CPs to establish a system of **protected areas** (including developing guidelines for selection, establishment, and management, and regulating and managing the protected areas). CPs also to promote ecosystem and species protection in other viable habitats; promote environmentally sound development in areas adjacent to protected areas.

(Article 9) CPs to complement in situ measures with **ex-situ conservation** of components of biological diversity.

(Aichi Target 11) At least 17% of terrestrial and inland water areas, and 10% of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of **protected areas** and other effective area-based conservation measures and integrated into the wider landscapes and seascapes.

(Aichi Target 13) **Genetic diversity** of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

(Aichi Target 15) **Ecosystem resilience** and the contribution of biodiversity to **carbon** stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification's.

2. Sustainable Use of Biodiversity

(Article 10) CPs to encourage **sustainable use** of components of biological diversity to minimize impacts, including by protecting customary/traditional uses.

(Aichi Target 12) **Extinction** of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

3. Management Plan Implementation

4. Compensatory Mitigation

5. Rehabilitation and restoration

(Article 8) CPs to rehabilitate and restore **degraded ecosystems** and promote recovery of threatened species through plans and management strategies.

(Article 8) Prevent, control, manage **invasive** alien species.

(Article 15) Addresses use, access, regulation, equity, and research of **genetic resources**.

(Aichi Target 5) The rate of **loss of all natural habitats**, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

(Aichi Target 8) **Pollution**, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

(Aichi Target 9) **Invasive** alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

(Aichi Target 10) Multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by **climate change** or ocean acidification are minimized, to maintain their integrity and functioning.

(Aichi Target 14) Ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are **restored** and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.

6. Monitoring

(Article 7 & Annex I) CPs to identify components of biological diversity identified in Annex I; **Monitor** those components; identify processes and activities that are likely to impact those components; maintain the monitoring data.

(Annex I) Components of biological diversity:

- (1) *Ecosystems and habitats: containing high diversity, large numbers of endemic or threatened species, or wilderness; required by migratory species; of social, economic, cultural or scientific importance: or, which are representative, unique or associated with key evolutionary or other biological processes.*
- (2) *Species and communities which are: threatened: wild relatives of domesticated or cultivated species; of medicinal, agricultural or other economic value; or social, scientific or cultural importance: or importance for research into the conservation and sustainable use of biological diversity, such as indicator species: and*
- (3) *Described genomes and genes of social, scientific or economic importance.*

(Point 3e of 2011-2020 Stra. Plan) Parties need to monitor the **implementation** of national biodiversity strategies.

(Point 3g of 2011-2020 Stra. Plan) Parties need to monitor the **status and trends** of biodiversity and ecosystem services, share data, develop indicators and measures, and do assessments to support IPBES.

7. Other non-legislative approaches

(Aichi Target 4) Governments, businesses and stakeholders at all levels have taken steps to achieve or have implemented plans for **sustainable production** and consumption.

(Aichi Target 6) Fish and invertebrate stocks and aquatic plants are managed and **harvested** sustainably, legally and applying ecosystem-based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

(Aichi Target 7) Areas under **agriculture**, aquaculture and forestry are managed sustainably.

Economic instruments

(Aichi Target 20) **Mobilization** of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.

1. Incentives

(Aichi Target 3) incentives, including subsidies, **harmful** to biodiversity are eliminated, phased out or reformed to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied.

2. PES schemes

3. Grants

(Points 9&11 of 2011-2020 Stra. Plan) Requests **GEF** support parties in revising national biodiversity strategies and action plans and implementing strategic plan.

(Point 12 of 2011-2020 Stra. Plan) Requests UNDG, World Bank, regional development banks, NGOs, business sector to support parties in implementing strategic plan.

4. State aid

5. Private sector payment

6. Foreign grants, programs

(Article 8) Promotes Parties to cooperate in providing financial aid especially to **developing countries**, to meet activities of the convention.

(Article 20) Developed countries provide financial support to **developing countries** in the implementation of measures necessary to achieve the goals of the convention.

(Article 21) Details financial mechanism for developed countries to provide financial support to developing countries.

(Point 10 of 2011-2020 Stra. Plan) Urges developed nations and financial institutions to finance developing nations in implementation of the strategic plan.

7. Capacity building

Communication, education and public awareness: including training

(Article 8) CPs to respect, preserve and maintain knowledge, innovations and practices of **indigenous and local communities** embodying traditional lifestyles relevant for the conservation and sustainable

*use of biological diversity and promote their wider application with the **approval and involvement** of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge.*

(Article 12) CPs need to establish/support **training** and education programmes, promote research on conservation and sustainable use of biological diversity.

(Article 13) CPs need to promote **public education** and awareness of importance of biological diversity, including in the media.

(Point 6 and Annex section VI of 2011-2020 Stra. Plan) Encourages **capacity building** and knowledge sharing, esp with developing nations.

(Aichi Target 1) **People are aware** of the values of biodiversity and the steps they can take to conserve and use it sustainably.

(Aichi Target 19) Knowledge, the **science base** and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.

Cooperation

1. Coordination across sectors

(Articles 18 & 19) Address scientific and technical **collaboration** (including Indigenous knowledge) and research across borders and through international and national institutions, and how to share benefits from biotechnology.

(Article 25) Establishes the **Subsidiary** Body on Scientific, Technical, and Technological Advice.

(Point 3f & 16a of 2011-2020 Stra. Plan) Parties should update their national biodiversity **strategies** and take into account synergies among biodiversity-related conventions and relevant agreements.

2. Coordination with stakeholders (including IPLC)

(Article 15) Addresses access to **genetic resources**, including FPIC among CPs.

(Article 16) Addresses access to, and transfer of, **technology** among CPs.

(Point 3a&4 of 2011-2020 Stra. Plan) Speaks to inclusion of a **diversity of stakeholders**, including women and IPLC; and recognizes UN Declaration on the Rights of Indigenous Peoples.

(Point 8 of 2011-2020 Stra. Plan) Mainstream **gender** and promote gender equality in the implementation of the convention.

(Aichi Target 16) The Nagoya Protocol on Access to **Genetic Resources** and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational.

(Aichi Target 18) **Traditional knowledge**, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.

(Annex section V, point 14, 2011-2020 Str Plan) Participation of all relevant **stakeholders** should be promoted and facilitated at all levels of implementation. Initiatives and activities of indigenous and local communities, contributing to the implementation of the Strategic Plan at the local level, should be supported and encouraged.

3. Cross-border cooperation

(Article 5) Directs CPs to cooperate with other CPs for conservation and sustainable use of biodiversity.

(Article 14) CPs to engage in multi-lateral agreements for notification of & information exchange on potential adverse impacts of activities on neighbouring states and promote arrangements for emergency responses.

(Article 17) Addresses information exchange among CPs.

Name of Policy: EU 2030 Biodiversity strategy (2020)

Policy instrument	hydrologic regime	connectivity	habitat	water quality	Biotic composition
2030 Biodiversity Strategy	✓	✓	✓	✓	✓

Note that there are many components not included because of a lack of strong connection to freshwater biodiversity (e.g., advanced biofuels for energy generation). For the section on marine ecosystems, I only included what pertained to coastal ecosystems because of the connection to estuaries. However, some aspects are included even though the connection to freshwater is indirect (e.g., increasing forest cover was included because intact forests also protect the freshwater ecosystems found within them).

Purpose of Strategy

The EU's biodiversity strategy for 2030 is a comprehensive, ambitious and long-term plan to protect nature and reverse the degradation of ecosystems. The strategy aims to put Europe's biodiversity on a path to recovery by 2030, and contains specific actions and commitments.

Assessments

1. Risk assessment

(Section 2.2.9) In the Farm to Fork strategy, environmental risk assessment of **pesticides** will be strengthened.

2. Impact assessment

(Section 2.2.1) **Impact assessment** is required that will look at the possibility of an EU-wide methodology to map, assess and achieve a good condition of ecosystems so they can deliver benefits such as climate regulation, water regulation, soil health, pollination and disaster prevention and protection.

(Section 2.2.7) Me authorities should review water abstraction and impoundment permits to implement **ecological flows** in order to achieve good status or potential of all surface waters and good status of all groundwater by 2027 at the latest, as required by the Water Framework Directive.

3. Identification/definition, reporting and indicators

(Section 3.3.1) In 2020, the Commission launched a review of the reporting obligations of businesses under the Non-Financial Reporting Directive, with a view to improving the quality and scope of **non-financial disclosures**, including on environmental aspects such as biodiversity.

(Section 3.3.3) The Commission has developed in 2021 **methods, criteria and standards** to describe the essential features of biodiversity, its services, values, and sustainable use. These will include measuring the environmental footprint of products and organisations on the environment, including through life-cycle approaches and natural capital accounting. In this context, the Commission will support the establishment of an international natural capital accounting initiative.

Legislative measures and national policies

1. National strategies

(Section 2.1) Member States will then have until the end of 2023 to demonstrate significant progress in legally designating new **protected areas** and integrating ecological corridors.

(Section 2.1) **Overseas countries and territories** also host important biodiversity hotspots, not governed by EU environmental rules. The Commission encourages relevant Member States to consider promoting equal or equivalent rules in these countries and territories.

(Section 2.2.1) Request Member States to ensure **no deterioration** in conservation trends and status of all protected habitats and species by 2030. In addition, Member States will have to ensure that at least 30% of species and habitats not currently in favourable status are in that category or show a strong positive trend. The Commission and the European Environmental Agency will provide guidance to Member States in 2020 on how to select and prioritise species and habitats.

(Section 2.2.4) In addition to strictly protecting all remaining EU primary and old-growth **forests**, the EU must increase the quantity, quality and resilience of its forests, notably against fires, droughts, pests, diseases and other threats likely to increase with climate change. To retain their function for both biodiversity and climate, all forests need to be preserved in good health. To make this happen, the Commission will propose a dedicated EU Forest Strategy in 2021. It will include a roadmap for planting at least 3 billion additional trees in the EU by 2030.

2. Programs

(Section 2.2.2) Commission will take action to reduce by 50% the overall use of – and risk from – chemical **pesticides** by 2030 and reduce by 50% the use of more hazardous pesticides by 2030.

(Section 2.2.2) ...bring back at least 10% of **agricultural** area under high-diversity landscape features (e.g., buffer strips, non-productive trees, ponds). These help enhance carbon sequestration, prevent soil erosion and depletion, filter air and water, and support climate adaptation... Member States will need to translate the 10% EU target to a lower geographical scale to ensure connectivity among habitats, especially through the CAP instruments and CAP Strategic Plans, in line with the Farm to Fork Strategy, and through the implementation of the Habitats Directive.

(Section 2.2.2) At least 25% of the EU's **agricultural** land must be organically farmed by 2030.

3. EU-level governance (new)

(Section 3.1) the Commission will put in place a new European biodiversity **governance** framework. This will help map obligations and commitments and set out a roadmap to guide their implementation.

(Section 3.3.1) Commission will put forward a new initiative in 2021 on sustainable **corporate** governance. This initiative, which may take the form of a legislative proposal, will address human rights and environmental duty of care and due diligence across economic value chains in a proportionate way according to different sizes of enterprises.

Management

1. Protection

(Section 2.1): Enlarge EU **Natura 2000** network of protected areas (PrAr). Build a truly coherent Trans-European Nature Network. Designations should either help to complete the Natura 2000 network or be under national protection schemes.

- Integrate ecological corridors into PrAr system to prevent genetic isolation, allow for species migration, maintain and enhance healthy ecosystems.
- At least 30% of land and 30% of seas should be protected in the EU
- Strict protection for areas with high biodiversity or high climate change values. 10% of EU land and 10% of EU sea – should be strictly protected.
- Strictly protect all the EU's remaining primary and old-growth forests. PrAr and restoration priority in carbon-rich ecosystems (peatlands, wetlands, mangroves...) taking into account projected shifts in vegetation zones.
- All protected areas will need to have clearly defined conservation objectives and measures.
- Particular focus will be placed on protecting and restoring the tropical and sub-tropical marine and terrestrial ecosystems in the EU's outermost regions given their exceptionally high biodiversity value.

(Section 3.2) As regards the Birds and Habitats Directives, **enforcement** will focus on completing the Natura 2000 network.

2. Management plan implementation

(Section 2.2.2) Member States will need to translate the 10% EU target (i.e., 10% of **agricultural** area under high-diversity landscape features) to a lower geographical scale to ensure **connectivity** among habitats, especially through the CAP instruments and CAP Strategic Plans, in line with the Farm to Fork Strategy, and through the implementation of the Habitats Directive.

3. Rehabilitation and restoration

(Section 2.2) **Restore** degraded ecosystems: improve the health of existing and new protected areas, and bring diverse and resilient nature back to all landscapes and ecosystems:

- limiting soil sealing and urban sprawl, and tackling pollution and invasive alien species
- restoration targets to be set in 2021
- requires no deterioration in status/trends of ecosystems
- restore 25,000km of rivers

(Section 2.2.1) Commission will put forward a proposal for legally binding EU nature **restoration targets** in 2021 to restore degraded ecosystems (prioritize carbon sequestration, reduction of natural disasters).

(Section 2.2.7) Restore freshwater ecosystems and the natural functions of rivers by removing or adjusting barriers that prevent the passage of migrating fish and improving the flow of water and sediments. At least 25,000 km of rivers will be restored into **free-flowing rivers** by 2030 through the removal of primarily obsolete barriers and the restoration of floodplains and wetlands.

(Section 2.2.9) EU Chemicals Strategy for Sustainability will be put forward, along with a Zero Pollution Action Plan for Air, Water and Soil..., in order to promote the goal of zero **pollution** from nitrogen and phosphorus flows from fertilisers through reducing nutrient losses by at least 50%, while ensuring that there is no deterioration in soil fertility.

(Section 2.2.10) Implementation of the EU **Invasive Alien Species** Regulation and other relevant legislation and international agreements. Aim will be to manage established invasive alien species and decrease the number of Red List species they threaten by 50%.

4. Monitoring

(Section 2.2.9) The Commission will develop a set of indicators for the progressive reduction of **pollution** and will establish baselines to help monitor progress.

(Section 3.1) As part of the new European biodiversity **governance** framework, the Commission will put in place a monitoring and review mechanism. This will include a clear set of agreed indicators and will enable regular progress assessment and set out corrective action if necessary.

5. Other non-legislative approaches (including research)

(Section 3.3.4) Investing in research, innovation and knowledge exchange to test and develop how to prioritise 'green' over 'grey' solutions. Includes long-term strategic **research agenda** for biodiversity, including a science policy mechanism for research-based options for ratcheting up the implementation of biodiversity commitments, with increased funding.

(Section 3.3.4) Establish in 2020 a new **Knowledge Centre for Biodiversity** in close cooperation with the European Environment Agency. The Centre will: (i) track and assess progress by the EU and its partners including in relation to implementation of biodiversity related international instruments; (ii) foster cooperation and partnership, including between climate and biodiversity scientists; and (iii) underpin policy development. Moreover, the Commission will increase its support to the Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services.

Economic instruments

(Section 2.2.7) Large-scale river and floodplain **restoration investments** can provide a major economic boost for the restoration sector and for local socioeconomic activities such as tourism and recreation. At the same time, these investments can improve water regulation, flood protection, nursery habitats for fish, and the removal of nutrient pollution.

1. Incentives

(Section 2.2.2) Work with farmers to support and incentivise the transition to fully sustainable practices. Improving the condition and diversity of **agroecosystems** will increase the sector's resilience to climate change, environmental risks and socioeconomic shocks, while creating new jobs, for example in organic farming, rural tourism or recreation.

(Section 3.3.1) The Commission will help to build a '*European Business for Biodiversity*' movement, taking inspiration from recent initiatives and making this movement an integral part of the European Climate Pact. Particular attention will be paid to measures to incentivise and eliminate barriers for the take-up of **nature-based solutions**, as these can lead to significant business and employment opportunities in various sectors and are the key to innovation for economic or societal needs that rely on nature.

2. PES schemes

(Section 2.2.2) Work in tandem with the new **Farm to Fork** Strategy and the new Common Agricultural Policy (CAP), including by promoting eco-schemes and result-based payment schemes...The Commission will ensure that the CAP Strategic plans are assessed against robust climate and environmental criteria.

3. Grants

4. State aid

(Section 3.3.2) At least €20 billion a year should be unlocked for spending on nature. This will require mobilising private and **public funding** at national and EU level. Moreover, as nature restoration will make a major contribution to climate objectives, a significant proportion of the 25% of the EU budget dedicated to climate action will be invested in biodiversity and nature-based solutions.

Under Invest EU, a dedicated **natural-capital and circular-economy initiative** will be established to mobilise at least €10 billion over the next 10 years, based on public/private blended finance. Nature and biodiversity is also a priority for the European Green Deal Investment Plan. In 2021, the Commission will adopt a delegated act under the **Taxonomy Regulation** to establish a common classification of economic activities that substantially contribute to protecting and restoring biodiversity and ecosystems. This will be further supported by a Renewed Sustainable Finance Strategy.

The Commission will further promote **tax systems and pricing** that reflect environmental costs, including biodiversity loss. The ‘user pays’ and ‘**polluter pays**’ principles have to be applied to prevent and correct environmental degradation.

5. Private sector payment

(Section 3.3.2) At least €20 billion a year should be unlocked for spending on nature. This will require mobilising **private** and public funding at national and EU level. Moreover, as nature restoration will make a major contribution to climate objectives, a significant proportion of the 25% of the EU budget dedicated to climate action will be invested on biodiversity and nature-based solutions.

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6. Foreign grants, programs (e.g.EU)

(Section 4.2.3) In the last decade, the EU and its Member States collectively upheld their commitment to double **financial flows to developing countries** for biodiversity. The EU is ready to continue working with its partners and further increase its support post-2020.

Communication, education and public awareness: including training

(Section 3.3.4) Commission will propose a Council Recommendation on encouraging cooperation in education for environmental sustainability in 2021. This will provide guidance for schools and teachers on how to cooperate and exchange experiences across Member States on **biodiversity teaching**. The Commission will also provide support materials and facilitate the exchange of good practices in EU networks of teacher-training programmes.

(Section 4.2.3) EU will promote biodiversity coalitions with partners and civil society around the world. For example, in March 2020, the Commission launched the **Global Biodiversity Coalition** of national parks, aquariums, botanic gardens, zoos, natural history and science museums to help raise awareness around the world on the need to protect and nurture biodiversity. The Commission will consider launching or joining other High Ambition Coalitions to help develop the post-2020 framework.

Cooperation

1. Coordination across sectors

(Section 3.3.4) The Commission will also establish in 2020 a new **Knowledge Centre for Biodiversity** in close cooperation with the European Environment Agency. The Centre will: (i) track and assess progress by the EU and its partners including in relation to the implementation of biodiversity related international instruments; (ii) foster cooperation and partnership, including between climate and biodiversity scientists; and (iii) underpin policy development. Moreover, the Commission will increase its support to the Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services.

(Section 4.1) EU platform for the post-2020 global framework:

- The ambition should be that, by 2050, all of the world's ecosystems are restored, resilient, and adequately protected.
- Ambitious global 2030 targets in line with EU commitments in this strategy.
- stronger implementation, monitoring and review process.
- An enabling framework to bring the ambition to life, across areas such as finance, capacity, research, innovation and technology.
- Fair and equitable sharing of the benefits from the use of genetic resources linked to biodiversity.
- A principle of equality. This includes respect for the rights and the full and effective participation of indigenous peoples and local communities. There should be an inclusive approach with participation of all stakeholders, including women, youth, civil society, local authorities, the private sector, academia and scientific institutions.

2. Coordination with stakeholders (including IPLCs)

(Section 4.1) **Equitable share of benefits** from use of genetic resources... A principle of equality. This includes respect for the rights and the full and effective participation of indigenous peoples and local communities. There should be an inclusive approach with participation of all stakeholders, including women, youth, civil society, local authorities, the private sector, academia and scientific institutions.

(Section 4.2.3) In all of its work, the EU will strengthen the links between **biodiversity protection and human rights**, gender, health, education, conflict sensitivity, the rights-based approach, land tenure and the role of indigenous peoples and local communities.

3. Cross-border cooperation

(from Section 2.1, Expand protected area network) It will be important to set up ecological **corridors**... in this context, investments in green and blue infrastructure and cooperation across borders among Member States should be promoted and supported, including through the European Territorial Cooperation.

(Section 4.2.2) **Trade policy** will actively support and be part of the ecological transition. The Commission will ensure full implementation and enforcement of the biodiversity provisions in all trade agreements, including through the EU Chief Trade. The Commission will better assess the impact of trade agreements on biodiversity, with follow-up action to strengthen the biodiversity provisions of existing and new agreements if relevant Enforcement Officer. The Commission will take a number of steps to crack down on illegal wildlife trade.

(Section 4.2.3) By integrating policy coherence for **sustainable development** in all its policies, the EU will reduce the pressure on biodiversity worldwide. In all of its international cooperation, the EU should promote sustainable agricultural and fisheries practices and actions to protect and restore the world's forests. Particular attention will also be paid to **sustainable water resource management**,

the restoration of degraded land, and the protection and restoration of biodiverse areas with high ecosystem services and climate mitigation potential.

4. Enforcement

(Section 3.2) As regards the **Birds and Habitats Directives**, enforcement will focus on completing the Natura 2000 network, the effective management of all sites, species-protection provisions, and species and habitats that show declining trends. The Commission will also ensure that environment-related legislation with an impact on biodiversity is better implemented, enforced and – where necessary – reviewed and revised.

Name of Policy: EU Habitats (1992) and Birds (1979) Directives, including the Natura 2000 Network

Policy instrument	hydrologic regime	connectivity	habitat	water quality	Biotic composition
Habitats and Birds Directives (including the Natura 2000 network)		✓	✓		✓

Note that these two directives are grouped because the more recent Habitats directive includes most elements of the Birds Directive (and more, including establishing the Natura 2000 Network). I noted specifically the cases where the Birds directive differs. Reference to articles and annexes refer to the Habitats Directive.

Member States must establish a strict protection regime for all wild European bird species and other endangered species listed in Annex IV of the Habitats Directive, both inside and outside Natura 2000 sites. Designation of core sites for the protection of species and habitat types listed in Annex I and II of the Habitats Directive and Annex I of the Birds Directive, as well as for migratory birds. Together, these designated sites form part of a coherent ecological network of nature areas, known as the European Natura 2000 Network.

Purpose of Directives

The Conservation of **Wild Birds Directive** was adopted on 2 April 1979. The Birds Directive aspires to:

- Protect, manage and regulate all bird species naturally living in the wild within the European territory of the Member States, including the eggs of these birds, their nests and their habitats;
- Regulate the exploitation of these species.

The Council Directive on the conservation of natural habitats and of wild flora and fauna, the **Habitats Directive** was adopted on 21 May 1992 and complements and amends the Birds Directive. All pre-2004 15 Member States of the European Union are contracting parties to the Habitats Directive. The Habitat Directive is in force within the national borders of the Member States and on the continental shelf.

The aim of the Habitats Directive is to contribute towards ensuring biodiversity by means of the conservation of natural habitats and of wild fauna and flora in the European territory of the Member States.

Assessments

1. Risk assessment
2. Impact assessment

(Article 6, point 3) Any plan or project can only proceed in the case of a finding of no adverse effect. But if the plan or project must proceed for reasons of overriding public interest (i.e., human health, public safety), **compensatory measures** must be enacted to protect overall coherence of Natura 2000 network

3. Identification / definition, reporting and indicators

(Article 3) Creation of ecological network of special areas of conservation (**Natura 2000 network**) hosting the habitat types listed in Annex I and the habitats of the species listed in Annex II.

(Article 4) Each Member State must propose a **list of sites** for Natura 2000 network.

Legislative measures and national policies

1. National strategies

(Articles 3 and 4) Member states must **designate natural habitat sites** as part of the Natura 2000 network, to be maintained or restored.

2. Programs

(Article 6) Member States must establish **measures** specifically designed for the site or integrated into other development plans, to meet the ecological requirements of the habitats and/or species.

(Article 6) Member States must try to **avoid deterioration** of habitats and disturbance of designated species.

[**note that there is no list of potential measures]

3. Actions

(Article 12) Measures required to **prohibit** killing of species, disturbance (esp during breeding, rearing, hibernation, migration), taking of eggs, destruction of breeding sites, taking of species.

(Article 14) Establish **regulations** around access, taking of specimens, captive breeding, etc.

Management

1. Protection

(Annex I) Includes list of natural **habitat** types – including freshwater habitats (running water and standing water)

(Annex II) Includes list of **species** of conservation interest – the Annex also lists freshwater species

(Annex III) Includes **criteria** for selecting sites eligible for identification as sites of community importance and designation as special areas of conservation.

(Annex IV) Includes list of species in need of **strict protection**.

(Articles 3 and 4)

Sets up **Natura 2000 network** for protection. 1) to prevent the deterioration of any status, 2) to reach good ecological status and good chemical status, and 3) to implement all necessary measures to progressively reduce pollution from priority substances and ceasing or phasing out emissions, discharges and losses of priority hazardous substances. This refers to all surface water bodies, including those that form part of a Special Protection Area (SPA) under the Birds Directive and/or a Site of Community Importance (SCI) under the Habitats Directive. With regard to protected areas

Under the Habitats Directive, each Member State first identifies and proposes for protection important locations for those species and habitats present on their territory. The European Commission then selects, with the help of the Member States, the European Environment Agency and scientific experts, sites deemed of Community Importance (SCIs). If the national list is determined to be insufficient, Member States are requested to propose further sites to complete the network. Under the Birds Directive, sites are classified by Member States and after evaluation, included directly into the Natura 2000 network.

(Article 4, point 1) Note on sites for "...aquatic species which range over wide areas, sites will be proposed **only where there is a clearly identifiable area** representing the physical and biological factors essential to their life and reproduction".

2. Management plan implementation

(Article 2) Measures shall be designed to **maintain or restore** natural habitats and species.

(Articles 3 and 4) Member States shall endeavour to **improve ecological coherence** of Natura 2000 network by developing or managing features of the landscape important for species. The Habitats Directive strongly recommends the use of Natura 2000 **management plans** as a means of setting objectives and measures in an open and transparent manner.

(Article 10) Member States shall endeavour... in their land use planning and development policies...with a view to improving the ecological coherence of the Natura 2000 network, to encourage the **management** of features of the landscape which are of major importance for wild fauna and flora. Such features are those which, by virtue of their linear and continuous structures (**such as rivers with their banks**) or their function as steppingstones (such as ponds or small woods), are essential for the migration, dispersal and genetic exchange of wild species.

3. Compensatory mitigation

(Article 6, point 3) Any plan or project that might have an impact on the site... subject to **assessment** of its implications for the site and its conservation objectives; plan or project can only proceed in the case of a finding of no adverse effect. But if the plan or project must proceed for reasons of overriding public interest (i.e., human health, public safety), **compensatory measures** must be enacted to protect overall coherence of Natura 2000 network.

4. Rehabilitation and restoration

(Articles 3 and 4) Sets up **Natura 2000** network of habitats to be, where appropriate, restored to favourable conservation status.

(Article 22) Study whether species from Annex IV (species in need of strict protection) should be **reintroduced**.

(Article 22) Ensure the deliberate introduction into the wild of any species which is **not native** to their territory is regulated so as not to prejudice natural habitats within their natural range or the wild native fauna and flora, and if they consider it necessary, prohibit such introduction (e.g., for biocontrol).

5. Monitoring

(Article 11) Monitoring required for **conservation status** of habitats and species.

(Article 12, point 4) Monitoring of **incidental capture** or killing of listed species.

(Article 17) Every 6 years, Member States **report on implementation** of measures taken, including evaluation of impact of measures on conservation status of species and habitats.

6. Other non-legislative approaches (including research)

(Article 18) Encourage **research** and exchange of information, especially between Member States and coordination between Member States and the EC.

Economic instruments

1. Incentives
2. PES schemes
3. Grants
4. State aid

(Article 8) Primary responsibility for financing the Natura 2000 Network comes from Member States, but EC **co-financing** of measures if there is an excessive financial burden on any member state, depending on the priority of habitats and species, concentration of priority habitats in that Member States's territory. EU's LIFE fund contributes to demonstration and best practice projects for the management and restoration of Natura 2000 sites. Other major EU funds for agriculture and rural development, maritime and fisheries and regional development offer important investment opportunities in Natura 2000.

(Article 8) When co-financing is requested, measures will be prioritized for implementation; some may be postponed depending on availability of resources.

5. Private sector payment
6. Foreign grants, programs (e.g.EU)
7. Capacity building

Communication, education and public awareness: including training

(Article 17) Every 6 years, Member States **report on implementation** of measures taken, including evaluation of impact of measures on conservation status of species (Annex II) and habitats (Annex I).

(Article 22, point c) Member States shall promote **education** of need to protect species and habitats.

Cooperation

1. Coordination across sectors
2. Coordination with stakeholders (including IPLCs)
3. Cross-border cooperation

(Article 18) Encourage research and **exchange of information**, especially between Member States and coordination between Member States and the EC.

Name of Policy: Ramsar Convention (1971)

Policy instrument	hydrologic regime	connectivity	habitat	water quality	Biotic composition
Ramsar Convention	✓	✓	✓	✓	✓

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Includes main text and 4th strategic plan
CP=Contracting Party

Purpose of Convention

The Ramsar Convention on Wetlands provides the framework for the conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution toward achieving sustainable development throughout the world.

Assessments

1. Risk assessment
2. Impact assessment
3. Identification / definition, reporting and indicators

(Article 3): Each CP shall arrange to be informed at the earliest possible time if the **ecological character** of any wetland in its territory and included in the List has changed, is changing or is likely to change as the result of technological developments, pollution or other human interference.

National wetland **inventories** have been initiated, completed or updated and disseminated and used for promoting the conservation and effective management of all wetlands.

Legislative measures and national policies

1. National strategies

(Article 2): Each CP shall designate at least one **suitable wetland** within its territory on a List of Wetlands of International Importance, with boundaries described and delimited on a map. May incorporate riparian and coastal zones adjacent to the wetlands, and islands or bodies of marine water deeper than six metres at low tide lying within the wetlands, especially where these have importance as waterfowl habitat. Any Contracting Party can add to the List or extend the boundaries of wetlands already on the List. Can also delete or restrict boundaries of wetlands on the List in case of urgent national interests.

(4th Strategic Plan, point 1) First of 3 pillars to the convention is *the wise use of all wetlands through **national plans, policies and legislation**, management actions and public education.*

(4th Strategic Plan, Goal 1, Target 1) Wetland **benefits** are featured in national/local policy strategies and plans relating to key sectors such as water, energy, mining, agriculture, tourism, urban development, infrastructure, industry, forestry, aquaculture and fisheries at the national and local level.

(4th Strategic Plan, Goal 2, Target 6) Parties must commit themselves to efforts to **protect** and effectively **manage** the existing Ramsar Sites ... as well as to expanding the reach of the Convention by continuously working to add more sites and areas of wetlands recognized under the Convention. Target 6: There is a significant increase in area, numbers and ecological connectivity in the Ramsar Site network, in particular under-represented types of wetlands including in under-represented ecoregions and Transboundary Sites.

2. Programs
3. Actions

Management

1. Protection

(Article 4): Each CP shall promote the conservation of wetlands and waterfowl by establishing **nature reserves** on wetlands, whether they are included in the List or not, and provide adequately for their protection.

2. Sustainable use of biodiversity

(Article 2): Each CP shall consider its international responsibilities for the conservation, management and wise use of **migratory stocks** of waterfowl.

(Article 4) The CP shall endeavour through management to increase **waterfowl** populations on appropriate wetlands.

3. Management plan implementation

(Article 3) The CPs shall formulate and implement their planning to promote the **conservation** of the wetlands included in the List, and as far as possible the wise use of wetlands in their territory.

(4th Strategic Plan, point 1) First of 3 pillars to the convention is *the wise use of all wetlands through national plans, policies and legislation, **management actions** and public education.*

(4th Strategic Plan, Goal 1, Target 2) **Water use** respects wetland ecosystem needs for them to fulfil their functions and provide services at the appropriate scale *inter alia* at the basin level or along a coastal zone.

(4th Strategic Plan, Goal 1, Target 3) The public and private sectors have increased their efforts to apply guidelines and **good practices** for the wise use of water and wetlands.

(4th Strategic Plan, Goal 3, Target 9) The wise use of wetlands is strengthened through **integrated resource management** at the appropriate scale (e.g., within a river basin or along a coastal zone).

4. Compensatory mitigation

(Article 4): Where a Contracting Party in its urgent national interest, deletes or restricts the boundaries of a wetland included in the List, it should **compensate** for any loss of wetland resources, and in particular it should create additional nature reserves for waterfowl and for the protection, either in the same area or elsewhere, of an adequate portion of the original habitat.

5. Rehabilitation, restoration, and compensatory mitigation

(4th Strategic Plan, Goal 1, Target 4) **Invasive alien species** and pathways of introduction and expansion are identified and prioritized, priority invasive alien species are controlled or eradicated, and management responses are prepared and implemented to prevent their introduction and establishment.

(4th Strategic Plan, Goal 3, Target 12) **Restoration** is in progress in degraded wetlands, with priority to wetlands that are relevant for biodiversity conservation, disaster risk reduction, livelihoods and/or climate change mitigation and adaptation.

6. Monitoring

(4th Strategic Plan, Monitoring and Evaluation) See Annex 1 for goals, targets, tools, indicators and baseline.

7. other non-legislative approaches (including research).

(Art 4) The CP shall encourage **research** and the exchange of data and publications regarding wetlands and their flora and fauna.

Economic instruments

1. Incentives
2. PES schemes
3. Grants
4. State aid

(4th Strategic Plan, point 3) In 2014 the Conference of Parties to the Convention on Biological Diversity invited the Ramsar Convention to provide elements of advice concerning the funding that may be referred to the **Global Environmental Facility** through the Conference of Parties to the Convention on Biological Diversity.

5. Private sector payment
6. Foreign grants, programs (e.g.EU)
7. Capacity building

Communication, education, training, guidance, and public awareness

(Art 4) CP to promote the training of **personnel** competent in the fields of wetland research, management and wardening.

(Art 6) Conference of CP can... e) request relevant international bodies to prepare **reports** and statistics on matters which are essentially international in character affecting wetlands.

(Art 7) Representatives of the CP at such Conferences should include persons who are **experts** on wetlands or waterfowl.

(4th Strategic Plan, point 1) First of 3 pillars to convention is *the wise use of all wetlands through national plans, policies and legislation, management actions and **public education***.

(4th Strategic Plan, Goal 3) The wise use of all wetlands requires that Parties ensure they are addressing wetlands beyond those currently included in the Ramsar Site network... **Mainstreaming** recognition of ecosystem functions, services and benefits into a wide range of sectors and with a broad array of actors will help ensure the success of this effort.

(4th Strategic Plan, Goal 3, Target 11) Wetland functions, services and benefits are widely demonstrated, **documented** and disseminated.

(4th Strategic Plan, Goal 3, Target 14) Scientific **guidance** and technical methodologies at global and regional levels are developed on relevant topics and are available to policymakers and practitioners in an appropriate format and language.

(4th Strategic Plan, Goal 3, Target 16) Wetlands conservation and wise use are mainstreamed through **communication**, capacity development, education, participation and awareness.

Cooperation

1. Coordination across sectors

(4th Strategic Plan, Goal 3, Target 13) Enhance **sustainability** of key sectors such as water, energy, mining, agriculture, tourism, urban development, infrastructure, industry, forestry, aquaculture and fisheries, when they affect wetlands, contributing to biodiversity conservation and human livelihoods.

2. Coordination with stakeholders (including IPLCs)

(4th Strategic Plan, Goal 2) Parties must commit themselves to efforts to protect and effectively manage the existing Ramsar Sites and enable the full and effective **participation** of stakeholders, including indigenous peoples and local communities.

(4th Strategic Plan, Goal 3, Target 10) The traditional knowledge, innovations and practices of **Indigenous peoples and local communities** relevant for the wise use of wetlands and their customary use of wetland resources are documented, respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention, with a full and effective participation of Indigenous peoples and local communities at all relevant levels.

3. Cross-border cooperation

(Art 4) The CP shall encourage **research** and the exchange of data and publications regarding wetlands and their flora and fauna.

(Art 5) The CP shall consult about implementing **obligations** arising from the Convention, especially in the case of a wetland extending over the territories of more than one CP or where a water system is shared by CPs. They shall at the same time endeavour to coordinate and support present and future policies and regulations concerning the conservation of wetlands and their flora and fauna.

(Art 6) Conference of the CP to **review and promote** the implementation of this Convention, to meet at intervals of not more than three years, to discuss the implementation of this Convention; b) to discuss additions to and changes in the List; c) to consider information regarding changes in the ecological character of wetlands included in the List; d) to make general or specific recommendations to the Contracting Parties regarding the conservation, management and wise use of wetlands and their flora and fauna; e) to request relevant international bodies to prepare reports and statistics on matters which are essentially international in character affecting wetlands; f) to adopt other recommendations, or resolutions, to promote the functioning of this Convention.

(4th Strategic Plan, point 1), 3rd of 3 pillars to convention is international cooperation on **transboundary** wetlands and shared species.

(4th Strategic Plan, point 44) The Ramsar Regional Initiatives are effective mechanisms to promote and support **regional** and bilateral cooperation, capacity-building, technology and knowledge exchanges, wetland related information, communications and mobilization of financial resources for activities on the ground.

(4th Strategic Plan, point 45) Further cooperation between CP can be strengthened through the designation and joint management of **Transboundary** Ramsar Sites at river, lake and groundwater basin level.

(4th Strategic Plan, Goal 4, Target 15) Ramsar **Regional Initiatives** with the active involvement and support of the Parties in each region are reinforced and developed into effective tools to assist in the full implementation of the Convention.

4. Coordination across conventions

(4th Strategic Plan, point 43) Ramsar Convention is the lead partner in the implementation of activities related to wetlands under the **Convention on Biological Diversity** (CBD) and has a responsibility to offer political, technical and scientific advice and guidance to the CBD and enhance cooperation between the two conventions at all levels.

Name of Policy: **Convention on migratory species (1979)**

Policy instrument	hydrologic regime	connectivity	habitat	water quality	Biotic composition
Convention on Migratory Species		✓	✓	✓	✓

Purpose of Convention

As an environmental treaty of the United Nations, the Convention on Migratory Species (CMS), also known as the Bonn Convention, provides a global platform for the conservation and sustainable use of migratory animals and their habitats. CMS brings together the States through which migratory animals pass, the Range States, and lays the legal foundation for internationally coordinated conservation measures throughout a migratory range.

Assessments

1. Risk assessment (includes status assessment)

(Art III, points 2 & 3) Migratory species may be listed in **Appendix I** (endangered species) when evidence indicates the species is endangered. A migratory species may be removed from Appendix I when the Conference of the Parties determines that the species is no longer endangered, and the species is not likely to become endangered again because of loss of protection due to its removal from Appendix I.

(Art IV, points 1 & 2) **Appendix II** shall list migratory species which have an unfavourable conservation status and which require international agreements for their conservation and management, as well as those which have a conservation status which would significantly benefit from the international co-operation that could be achieved by an international agreement. (A migratory species may be listed both in Appendix I and Appendix II).

(Art V) Lists guidelines for Agreements among **Parties** that are part of species' range states. Covered in more detail under "Cross border cooperation".

(Art V, point 5a). Agreements among **Member States** should provide for periodic review of the conservation status of the migratory species concerned and the identification of the factors which may be harmful to that status.

2. Impact assessment

3. Identification / definition, reporting and indicators

Legislative measures and national policies

1. National strategies

(Art II, 3a) The Parties shall endeavour to conclude **Agreements** covering the conservation and management of migratory species included in Appendix II. See Art IV for details. Covered in more detail under “cross-border cooperation”.

2. Programs

3. Actions

Management

1. Protection

(Article II, 3b) The Parties shall endeavour to provide immediate **protection** for migratory species included in Appendix I (endangered migratory species).

(Article V, point 5f). Agreements among Member States should provide for maintenance of a **network of suitable habitats** appropriately disposed in relation to the migration routes.

2. Sustainable use of biodiversity

(Article V, point 5j&k). Agreements among Member States include measures to control and manage the **taking** of the migratory species; procedures for co-ordinating action to suppress illegal taking.

3. Management plan implementation

(Article III, 4) Parties that are Range States of a migratory species listed in Appendix I shall endeavour to **conserve** and, where feasible and appropriate, restore those species’ **habitats**.

(Article V, point 5b) Agreements among Member States should provide for coordinated conservation and **management plans**.

(Article V, point 5e) Agreements among Member States should provide for conservation and restoration of the habitats of importance in maintaining a favourable conservation status, and protection from **disturbances** (e.g., exotic invasive species control).

(Article V, point 5i) Agreements among Member States should provide for prevention, reduction or control of the release into the habitat of the migratory species of **substances harmful** to that migratory species.

4. Compensatory mitigation

(Article III, point 4) Parties that are Range States of a migratory species listed in Appendix I shall endeavour to prevent, remove, compensate for or minimize, as appropriate, the adverse effects of activities or **obstacles** that seriously impede or prevent the migration of the species.

(Article V) Agreements among Member States should provide for the elimination of, to the maximum extent possible, or compensation for activities and obstacles which **hinder or impede migration**.

5. Rehabilitation and restoration

(Article III, point 4) Parties that are Range States of a migratory species listed in Appendix I shall endeavour to:

- conserve and **restore** species’ habitats that are important for removing them from danger of extinction.
- the extent feasible and appropriate, to prevent, reduce or control factors that are endangering or are likely to further endanger the species, including strictly controlling the introduction of, or controlling or eliminating, already introduced **exotic species**.

(Article V) Agreements among Member States should provide for:

- conservation and restoration of the habitats of importance in maintaining a favourable conservation status, and protection of such habitats from disturbances, including strict control of the introduction of, or control of already introduced, **exotic species** detrimental to the migratory species.
- where it appears desirable, the provision of **new habitats** favourable to the migratory species or reintroduction of the migratory species into favourable habitats.

6. Monitoring

(Article V) Parties that are Range States of migratory species listed in Appendix II to conclude Agreements which should establish, if necessary, appropriate machinery to assist in carrying out the aims of the agreement, to monitor its **effectiveness**, and prepare reports.

7. Other non-legislative approaches (including research)

(Art II, 3a) The Parties should promote, co-operate in and support **research** relating to migratory species.

(Art V, point 5c) Agreements among Member States should provide for **research** into the ecology and population dynamics of the migratory species concerned, with special regard to migration.

(Art VIII, point 5) The Conference of the Parties shall determine the functions of the **Scientific Council**, which may include recommending and coordinating research, evaluating research results, assessing status, and reporting to the Conference of the Parties on status and measures for improvement.

Economic instruments

1. Incentives
2. PES schemes
3. Grants
4. State aid
5. Private sector payment
6. Foreign grants, programs (e.g.EU)
7. Capacity building

Communication, education and public awareness: including training

(Art V, point 5n) Agreements among Member States should provide for making the **general public** aware of the contents and aims of the agreement.

Cooperation

1. Coordination across sectors

(Art V, point 5d) Agreements among Member States should provide for the **exchange** of information on the migratory species concerned, with special regard being paid to the exchange of the results of research and of relevant statistics.

(Art V, point 5l) Agreements among Member States should provide for exchange of information on substantial **threats** to the migratory species.

2. Coordination with stakeholders (including IPLCs)
3. Cross-border cooperation

(Art IV, 3 and Art V, 1-4) Range States of migratory species should conclude **agreements** to benefit the species and should give priority to those species in an unfavourable conservation status. The object of each agreement shall be to restore the migratory species to a favourable conservation status or to maintain it in such a status. Agreements to address conservation and management of the species and cover its whole range. Agreements should, wherever possible, deal with more than one migratory species. Details of what should be included in the Agreements listed in point 4 a-f.

Name of Policy: EU Floods Directive (2007)

Policy instrument	hydrologic regime	connectivity	habitat	water quality	Biotic composition
Floods Directive	✓	✓	✓	✓	

Purpose of Directive

The aim of the Directive is to reduce and manage the risks that floods pose to human health, the environment, cultural heritage, and economic activity. This Directive requires Member States to assess if all water courses and coast lines are at risk from flooding, to map the flood extent and assets and humans at risk in these areas and to take adequate and coordinated measures to reduce this flood risk. With this Directive also reinforces the rights of the public to access this information and to have a say in the planning process.

Assessments

1. Risk assessment

(Article 4, point 1) Member States shall for each river basin district... or the portion of an international river basin district lying within their territory, undertake a preliminary **flood risk assessment**.

(Article 4, point 2) Based on available or readily derivable information, such as records and studies on long term developments, in particular impacts of climate change on the occurrence of floods, a preliminary **flood risk assessment** shall be undertaken to provide an assessment of potential risks. The assessment shall include at least the following:

- Maps of the river basin district
- A description of the (significant) floods which have occurred in the past
- An assessment of the potential adverse consequences of future floods for human health, **the environment**, cultural heritage and economic activity.

(Article 5, point 1) Member States shall... identify those areas for which they conclude that **potential significant flood risks** exist or might be considered likely to occur.

(Article 6, Point 1) Member States shall prepare **flood hazard maps** and flood risk maps.

(Article 6, point 3) Flood hazard and flood risk maps to use **scenarios** (low-medium-high probability of flooding).

(Article 6, point 4) Flood hazard and flood risk scenarios to show **flood extent, depth, velocity of water**.

(Article 6, point 5) Flood risk maps to show potential adverse consequences including #inhabitants potentially affected, type of economic activity potentially affected, areas potentially affected by pollution, other useful information (e.g., where floods with a high content of transported sediments and debris floods can occur).

(Article 14) Flood risk assessment, flood hazard and risk maps, and management plans to be **updated** every 6 years.

2. Impact assessment
3. Identification / definition, reporting and indicators

Legislative measures and national policies

1. National strategies
2. Programs
3. Actions

Management

1. Protection
2. Sustainable use of biodiversity
3. Management plan implementation

(Annex) Describes contents of flood risk management plans.

(Article 7, points 1-4) On the basis of flood risk and hazard maps, Member States shall establish flood risk **management plans**.

- Plans to focus on reduction of adverse consequences for human health, **the environment**, cultural heritage, and economic activity.
- Plans shall include measures for achieving the objectives.
- plans shall take into account relevant aspects such as costs and benefits, flood extent and flood conveyance routes and **areas which have the potential to retain flood water, such as natural floodplains**, the environmental objectives of Article 4 of the WFD, soil and water management, spatial planning, land use, **nature conservation**, navigation and port infrastructure.
- Plans shall address all aspects of flood risk management focusing on prevention, protection, preparedness
- Measures should not increase flood risk in adjacent member states.

4. Compensatory mitigation
5. Rehabilitation and restoration
6. Monitoring
7. other non-legislative approaches.

Economic instruments

1. Incentives
2. PES schemes
3. Grants
4. State aid
5. Private sector payment
6. Foreign grants, programs (e.g.EU)
7. Capacity building

Communication, education and public awareness: including training

Cooperation

1. Coordination across sectors (includes coordination across directives)

(Article 3 point 1) Member States shall make use of the **administrative arrangements** made under Article 3(1), (2), (3), (5) and (6) of the WFD (assigning river basins to districts, identification of authority, assigning international river basins to multiple member states, coordination among member states of international river basins).

(Article 9, point 1) Flood hazard and risk **maps shall be** done in a way that is consistent with Articles 5(2), 13(7), 14 of the WFD (characteristics of the river basins in management plans, and includes public consultation).

2. Coordination with stakeholders (including IPLC)

(Article 10, points 1&2) Member States shall make **available to the public** and encourage active involvement of interested parties the preliminary flood risk assessment, the flood hazard maps, the flood risk maps and the flood risk management plans.

3. Cross-border cooperation

(Article 4, point 1) Member States shall for each river basin district... or the portion of an international river basin district lying within their territory, undertake a preliminary **flood risk assessment**.

(Article 4, point 3) In the case of international river basin districts...Member States shall ensure that **exchange of relevant information** takes place between the competent authorities concerned.

(Article 5, point 2) Identified areas of **potential significant flood risk** in international river basins shall be coordinated among the Member States concerned.

(Article 6, point 2) Flood hazard maps and flood risk maps shall be shared among Member States.

(Article 8, points 2 & 3) Flood risk management plans coordinated across Member States for international river basin districts, and also to the extent possible with non-EC countries.

Name of Policy: Convention on the Protection and Use of Transboundary Watercourses and International Lakes (1992)

Policy instrument	hydrologic regime	connectivity	habitat	water quality	Biotic composition
Convention on the Protection and Use of Transboundary	✓	✓	✓	✓	

Water Courses and International Lakes					
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- Note that while this policy refers at the outset to water quality and quantity, most of the detailed text references only water quality not quantity.
- Ecosystem-based approaches to water quality remediation are not mentioned. However, ecological and ecosystem criteria are included in development of objectives and criteria (Annex III).

Purpose of the Convention

The Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) is a unique international legal instrument and intergovernmental platform which aims to ensure the sustainable use of transboundary water resources by facilitating cooperation. It promotes the sustainable management of shared water resources, implementation of the Sustainable Development Goals, prevention of conflicts, and promotion of peace and regional integration.

Assessments

1. Risk assessment
2. Impact assessment

(Article 9, point 2) Agreements among riparian states may include participation in the implementation of **environmental impact assessments**.

3. Identification / definition, reporting and indicators

(Article 3 point 2) Each Party shall set **emission limits** for discharges from point sources into surface waters based on the best available technology, which are specifically applicable to individual industrial sectors or industries from which hazardous substances derive.

(Article 3, point 3 and Annex III) Each Party has to define water-quality **objectives** and adopt water-quality criteria for the purpose of preventing, controlling, and reducing transboundary impact. Objectives and criteria to include maintaining or improving existing water quality and reducing pollution loads. Parties must take into account *requirements regarding sensitive and specially protected waters and their environment, e.g., lakes and groundwater resources*. Must be based on the application of ecological classification methods and chemical indices for the medium- and long-term review of water-quality maintenance and improvement.

(Article 9, point 2). Agreements among riparian states may include **data** collection and compilation and inventories of pollution sources.

Legislative measures and national policies

1. National strategies
2. Programs

(Article 9, point 2) Agreements among riparian states may include action programmes for reduction of **pollution**.

3. Actions

Management

1. Protection
2. Sustainable use of biodiversity
3. Management plan implementation

(Article 2, points 1&2) The Parties shall take all appropriate measures:

- (a) To prevent, control and reduce **pollution** of waters causing or likely to cause transboundary impact. Best available technology and for water quality remediation defined in Annex I. Guidelines for developing Best Environmental Practices defined in Annex II;
- (b) To ensure that transboundary waters are used with the aim of ecologically sound and rational **water management**, conservation of water resources and environmental protection;
- (c) To ensure that transboundary waters are used in a reasonable and **equitable** way, taking into particular account their transboundary character, in the case of activities which cause or are likely to cause transboundary impact.

(Article 2, points 3-8) Measures for the prevention, **control** and reduction of water pollution:

- Shall be taken, where possible, at source.
- Shall not directly or indirectly result in a transfer of pollution to other parts of the environment;
- Shall be guided by the precautionary and polluter-pays principles.
- Shall be managed so that the needs of the present generation are met without compromising the ability of future generations to meet their own needs.
- Riparian parties shall cooperate.
- Right of Parties individually or jointly to adopt and implement more stringent measures than those set down in this Convention.

(Article 3) Lists measures to be taken to control pollutant discharge to transboundary waters.

4. Compensatory mitigation

5. Rehabilitation and restoration

(Article 2, points 1&2) The Parties shall take all appropriate measures:

- (d) To ensure conservation and, where necessary, **restoration** of ecosystems.

6. Monitoring

(Article 4) The Parties shall establish **programmes** for monitoring the conditions of transboundary waters.

(Article 9, point 2 and Article 11). Riparian states shall to establish **joint** monitoring programmes concerning water quality and quantity and effectiveness of control programmes. Includes agreeing on pollution parameters, monitoring methods, establishing emissions limits for pollutants.

7. Other non-legislative approaches (includes research and development)

(Article 5) Parties shall cooperate in the conduct of research into and development of effective **techniques** for the prevention, control, and reduction of transboundary impact. Includes list of R&D topics.

(Article 9, point 2). Agreements among riparian states may include cooperation and exchange of information on the best available **technology** as well as to encourage cooperation in scientific research programmes.

(Article 12) Riparian Parties shall undertake specific research and development activities in support of achieving and maintaining the water-quality objectives and criteria.

Economic instruments

1. Incentives
2. PES schemes
3. Grants
4. State aid
5. Private sector payment
6. Foreign grants, programs (e.g.EU)
7. Capacity building

Communication, education and public awareness: including training

(Article 9, point 2). Agreements among riparian states may include a forum for the **exchange of information** on existing and planned uses of water and related installations that are likely to cause transboundary impact.

(Article 11) Results from **monitoring** shall be made available to the public.

(Article 16) Riparian states to make publicly available water quality **objectives**, permits issued and sampling results.

Cooperation

1. Coordination across sectors

(Article 6) Parties shall provide for the widest exchange of information, as early as possible, on issues covered by the provisions of this Convention.

2. Coordination with stakeholders (including IPLCs)

3. Cross-border cooperation

(Article 9 points 1 & 2) Riparian parties to enter into bi-lateral and multi-lateral **cooperative arrangements** regarding the prevention, control and reduction of transboundary impact. Tasks of these joint bodies include data collection, monitoring and evaluation, inventories of pollution sources, development of joint measures and procedures, technology information exchange, impact assessments etc.

(Article 10) Calls for good faith **consultation** among riparian parties.

(Article 13) Calls for riparian states to **exchange data** on environmental conditions, experience gained, data, measures taken, discharge, permits issued, national regulations.

(Article 14) Riparian Parties have to inform each other about any **critical situation** that may have transboundary impact.

(Article 15) Riparian Parties shall provide **mutual assistance** upon request.

(Annex IV) Contains information about **arbitration** among parties.

Name of Policy: Recovery plan for European Eel (2007)

Policy instrument	hydrologic regime	connectivity	habitat	water quality	Biotic composition
Recovery Plan for the European Eel		✓	✓		✓

Purpose of Plan

In 2007, the EU adopted the 'eel regulation' which provided a framework for the recovery of the stock in the long-term. In an effort to protect the stock and ensure its sustainable use, EU countries established eel management plans (EMPs) for the river basins with significant eel habitats. The plans provided various measures to:

- ensure that at least 40% of adult eels escape to the sea,
- limit professional and recreational fisheries;
- make it easier for fish to migrate through the rivers
- restock suitable inland waters with young eels.

Assessments

1. Risk assessment
2. Impact assessment
3. Identification / definition, reporting and indicators

(Article 2, point 1 & 2) Member states have to identify **river basins** with natural eel habitats, referring to river basin definitions in the Water Framework Directive.

(Article 2, point 5) Describes methods for determining level of **escapement** to the sea (i.e., historic data, habitat assessment, comparisons to similar river systems).

Legislative measures and national policies

1. National strategies

(Article 2, point 8) Includes list of **measures** for achieving objectives of Eel management plans (e.g., fishing, restocking, passage, predator control, aquaculture, managing hydro operations).

2. Programs

(Article 7) Member states that permit fishing must **restock**.

(Article 8) Member states that engage in eel fishing in Community waters (i.e., coastal waters) must **reduce fishing** effort and/or catch.

(Article 11) Member states that engage in eel fishing must track **commercial** fishing vessels and entities authorized to market the eel and estimate number of recreational fishers and their catches.

(Article 12) Member states have to track eel **imports and exports**, and whether eels harvested were done in compliance with established measures.

3. Actions

(Article 4) Member states that have **not submitted** Eel management plans by Dec 2008 must reduce fish catch.

Management

1. Protection
2. Sustainable use of biodiversity
3. Management plan implementation

(Article 2) Member States must prepare an eel management **plan** with the objective of permitting *escapement to the sea of at least 40 % of the silver eel biomass relative to the best estimate of escapement that would have existed if no anthropogenic influences had impacted the stock.* Management Plan to include:

- Description and analysis of the current situation;
- Measures to attain, monitor and verify objective;
- Measures may include controls on fishing, restocking, river passage, river habitat restoration, predator control, aquaculture, managing hydro operations, etc.
- Time schedule of implementation of measures;
- Control and enforcement measures.

(Article 6) Management **plans** must be jointly prepared by multiple Member States in the case of transboundary river basins.

4. Compensatory mitigation
5. Rehabilitation and restoration
6. Monitoring

(Article 2, point 7) Eel management plan includes monitoring.

(Article 9 point 1) Monitoring report every 6 years to include eel escapement to the sea, level of fishing, mortality outside of fishery.

(Article 10) Member states have to establish a control and catch monitoring system.

7. Other non-legislative approaches

Economic instruments

1. Incentives
2. PES schemes
3. Grants
4. State aid
5. Private sector payment
6. Foreign grants, programs (e.g.EU)
7. Capacity building

Communication, education and public awareness: including training

Cooperation

1. Coordination across sectors
2. Coordination with stakeholders (including IPLC)
3. Cross-border cooperation

Name of Policy: Pan European Action Plan for Sturgeons (2018)

Policy instrument	hydrologic regime	connectivity	habitat	water quality	Biotic composition
Pan European Action Plan for Sturgeon	✓	✓	✓	✓	✓

Purpose of Plan

The goal of the plan is to restore all existing sturgeon populations to “least concern” (IUCN) or “favourable” (Habitats Directive) status and re-establish self-sustaining sturgeon populations as well as their life-cycle habitat in their historic range to an extent that ensures species survival and representation of the subpopulations where possible. Sturgeons are excellent flagship species for ecologically healthy rivers and seas due to their size, longevity, diverse habitat utilization and their migratory life cycle that connects coastal waters to the upper reaches of riverine ecosystems. Therefore, their protection needs a holistic approach, connecting international waters, coastal areas, and often multi-national river systems. This plan is intended to serve as a guiding framework on the Pan-European level, while not replacing existing national or regional plans. This will allow for better coordination and pooling of resources among national states, with international or regional conventions. The geographic scope is countries with rivers and seas in Europe that have sturgeon as resident or vagrant elements of their fauna.

Assessments

1. Risk assessment
2. Impact assessment

(Activity 1.3.1) Identification of locations and extent of **losses of fish** through ship strikes, hydropower and water abstraction facilities.

(Activity 3.1.3 and 3.1.4) Identify conflicts and common interests between economic development plans, identified habitats and their functionality; mitigate conflicts.

3. Identification / definition, reporting and indicators

(Activity 3.2.1 and 3.2.2) Identify **habitat restoration** possibilities and develop an integrated concept for restoration of key habitats to reach near natural ecosystem functions providing sufficient carrying capacity for self-sustaining sturgeon population in a given river basin.

(Action 3.3.1) Countries identify **suitability** of rivers for sturgeon restoration using the criteria: (1) Existing sturgeon populations; (2) Existing material for reintroduction; (3) Favourable habitat, resources and conditions; (4) Good potential for the restoration of habitats.

(Action 4.2.1) Identify relevant **obstacles** for sturgeon migration. Prioritize mitigation of migration obstacles according to criteria such as: existing stocks, former habitat, existing or former spawning sites, river length, existing habitat, and recolonization potential. Conduct feasibility studies for facilitating up and downstream migration at highest priority barriers.

Legislative measures and national policies

1. National strategies

(Action 4.1.1) Prohibit any further **construction** of migration obstacles based on existing legislation, laws, treaties and conventions.

(Action 4.1.2) Establish legal prerequisites for future in-river **construction** development, including a minimum bypass with suitable conditions for fish migration of 30% of the discharge at all times.

2. Programs

(Action 1.1.3) Strengthen implementation and enforcement of existing legislation to prevent illegal, unregulated and undocumented **fisheries** in marine and freshwater.

(Action 6.1) Increase enforcement and prosecution of illegal trade in sturgeon **products**.

(Action 7.2.3) Develop and adapt inland **waterway transportation plans**, considering the protection of sturgeon habitats.

3. Actions

Management

1. Protection

(Action 3.1.1 and 3.1.2) Identify existing **critical habitats** and ensure legal protection of priority habitats and their functions.

2. Sustainable use of biodiversity

(Action 1.1.1) **Fishing** of sturgeon species is/remains prohibited until viable populations are established and is allowed only at levels that prevent the populations to drop below IUCN Vulnerable level.

(Action 1.2.1) Identification of **bycatch** and its impacts in marine- and freshwater.

3. Management plan implementation

(Action 1.2.2) Identification and implementation of **management options** (technical solutions, fishery restriction, closed areas, closed season) and gear modifications to reduce bycatch in marine and inland fisheries.

(Action 1.3.2) Implementation of **avoidance measures** for fish losses through ship strikes, hydropower and water abstraction facilities.

4. Compensatory mitigation

5. Rehabilitation and restoration

(Action 2.1) Establish basin-wide **ex situ** programmes following best practice guidelines for husbandry (includes securing funding and building ex situ facilities, establishing ex situ stocks, perform quality control, establish long-term breeding plans to preserve all available genetic diversity).

(Action 2.2) **Breed** and release juveniles.

(Action 3.2.3) Implement pilot **restoration** actions identified in activities 3.2.1 and 3.2.2.

(Action 4.2.5) Establish **mitigation** measures such as sediment and flow management as part of the concession for new or reiterated riparian water rights (mitigation measures to be included into rentability analysis of hydropower developments).

6. Monitoring

(Action 1.1.2) Effectively monitor **catch allowance** for establishment of ex situ populations and for scientific purposes according to objective 2.1.4.

(Action 1.2.3) Monitoring of compliance with **bycatch avoidance** measures and adaptive management.

(Action 2.2.3) Monitoring for **breed and release** program.

(Action 3.2.4) Monitor the habitat quality in pilot restoration actions implemented in Action 3.2.3, with special emphasis on criteria relevant for sturgeons.

(Action 4.2.7) Establish monitoring guidelines, identify suitable devices and implement programmes to assess **fish passage** efficiency.

(Action 5.1) Develop, fund, and implement monitoring program for all **sturgeon life stages**.

(Action 7.2.2) Adapt reference conditions for national **Water Framework Directive** monitoring criteria to better represent long-distance migrants and umbrella species.

(Action 9.1) Action Plan **implementation** is monitored through nomination of focal points, convening a working group, developing a reporting schedule and mechanism, and providing regular reports leading to adaptive management decisions.

7. Other non-legislative approaches

Economic instruments

(Action 7.1) Calls for funding **plan** but no specific instruments or actions suggested.

1. Incentives
2. PES schemes
3. Grants
4. State aid
5. Private sector payment
6. Foreign grants, programs (e.g.EU)
7. Capacity building

Communication, education and public awareness: including training

(Activity 1.1.4) Provide adequate **resources** as well as continuous **capacity building** and targeted training for relevant enforcement authorities.

(Action 8.1) Develop and implement targeted **communication** strategy to raise stakeholder and national authority awareness of sturgeon and keep the Action Plan high on the political agenda.

(Action 8.2.2) Organize regular European and/or basin-wide **expert meetings** to increase knowledge on sturgeon conservation and to organize transfer of knowledge and knowhow from science to managers and stakeholders.

Cooperation

1. Coordination across sectors

(Action 1.4.1) Facilitate regional coordination of **protection** measures mentioned above.

2. Coordination with stakeholders (including IPLC)

(Activity 1.1.5) Involve fishermen and develop **alternative income** sources for affected fishing communities.

3. Cross-border cooperation

(Action 3.4.1) Facilitate coordination and supervision of **habitat protection**, restoration and monitoring actions across regional river and sea commissions and national ministries.

(Action 7.2.1) Revisit **listing** of species in conventions and regulations following the current IUCN red list status.

(Action 8.2.1) Strengthen inter-agency and inter-sectoral **cooperation**, such as of river basin and regional seas authorities, nature conservation and fisheries agencies to develop a common approach towards sturgeon conservation.