



Natura 2000 and Hydropower

**Hydropower and Fish Workshop
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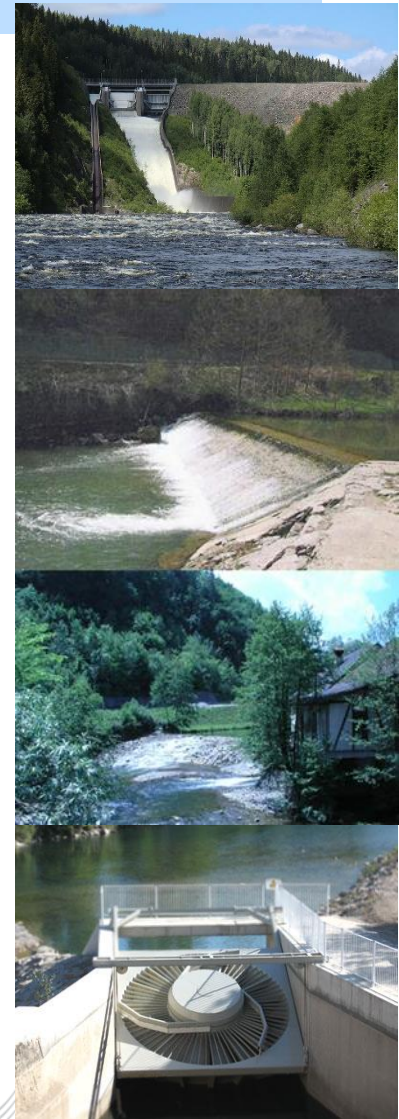
Hydropower and Natura 2000

Hydropower

- ❖ one of several important sources of RE
- ❖ key role in EU Renewable Energy and Climate Change targets for 2020 and beyond
- ❖ stable, flexible, efficient form of electricity
- ❖ "physical" potential to develop hydropower (esp. Balkans)

Europe's Rivers

- ❖ Major source of biodiversity
- ❖ Part of our rich heritage
- ❖ Undergone major changes over the decades
- ❖ Reduced resilience and capacity to sustain wildlife
- ❖ Many in degraded state and need for restoration



Biodiversity and Nature Protection Policy Framework

- **EU Biodiversity Strategy (2011)**
 - **Nature Directives**

1979: The Birds Directive
(consolidated version 2009)

**1992: The Habitats
Directive**

Objective: "to ensure that species and habitat types they protect are maintained and restored to a favourable conservation status throughout their natural range within the EU"

Provisions of Nature Directives in relation to hydropower

Two main types of measures required

- Designation and conservation of **Natura 2000 sites**



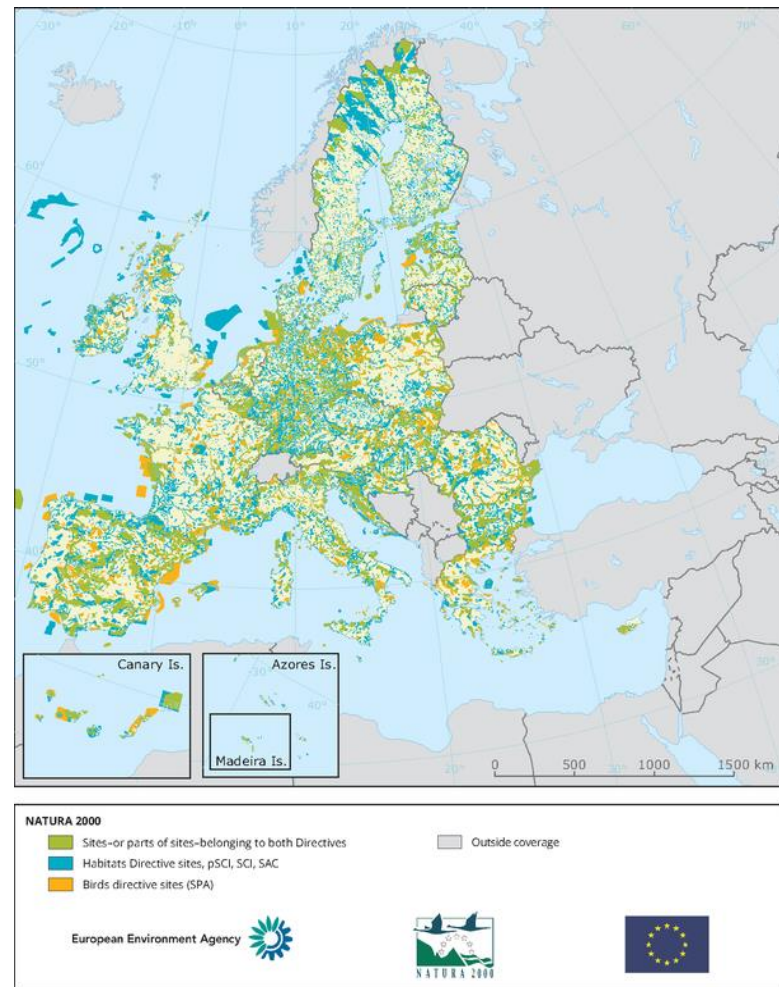
- Establishment of a **species protection regime**

- wild European Bird Species under Birds Directive
- species of annex IV of Habitats Directive

This provision applies to all EU territory in and outside protected areas

Natura 2000 Network in EU

- ✓ Largest coordinated network of protected areas in the world - most important biodiversity areas
- ✓ 18% of the land area of the EU
- ✓ 6% of the sea area of the EU
- ✓ 27.522 sites terrestrial and marine
- ✓ Not designed to be 'no go zones'
- ✓ New developments are possible as long as EU environment legislation provisions are respected



Natura 2000 protection provisions

Article 6 – relation between site's conservation and other land uses (such as hydropower) in and around the area

Two types of measures

Art. 6(1) and 6(2)

**Conservation management
(objectives, measures)**

Art. 6(3)

**Assessment procedure for
plans or projects
(appropriate assessment)**

Some facts on freshwater ecosystems

- **Around 400 protected species under B&H Directives depend on river and lake ecosystems for their survival**
- **Lakes and rivers: 4% of land surface of Natura 2000 network**
- **Intensive use of Europe's rivers only few major rivers in natural state**



- **2015 EEA report: > 50% EU rivers and lakes not in good ecological status**

Some facts on freshwater ecosystems

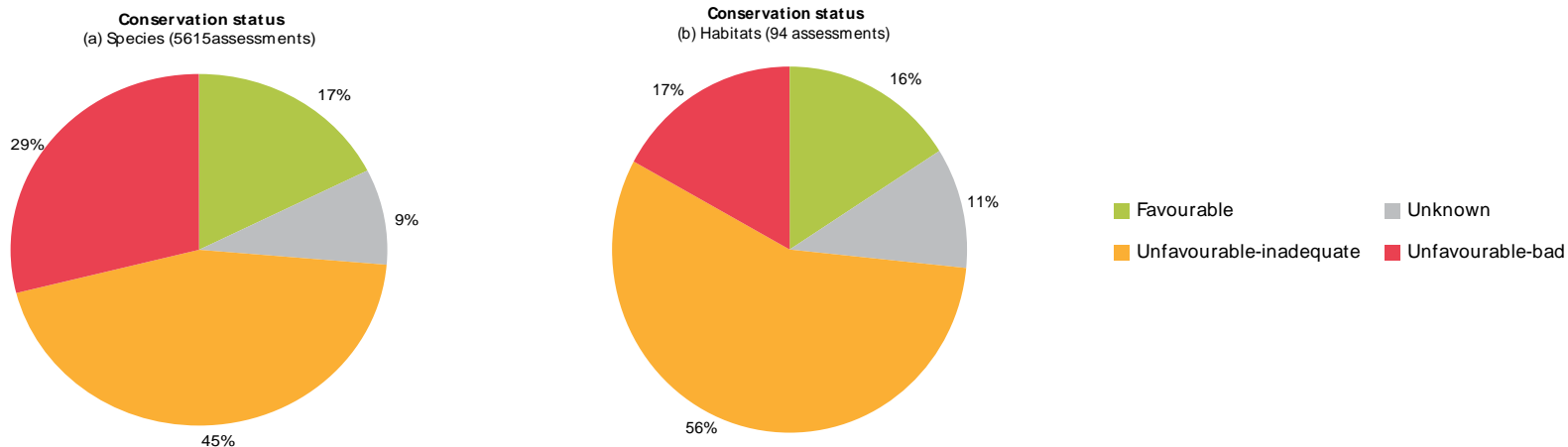
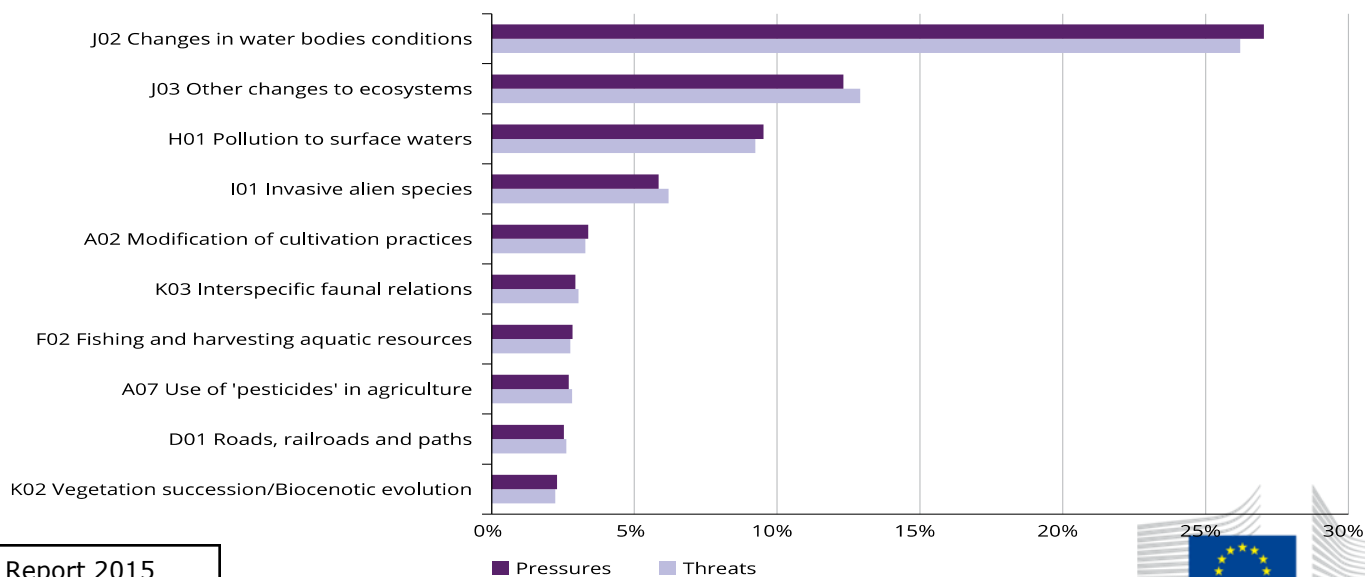


Figure 4.37 Top 10 (% of frequency) reported high-ranked pressures and threats for species (Habitats Directive) associated with rivers and lakes ecosystem



Hydropower in the EU

- Around *23.000 hydropower installations in EU (2011)*
- *91% small (less than 10 MWH) - 13% of total electricity production (TEP) from HPP - 2.1% total RE mix*
- *9% large - 87% TEP from HPP - 9% total RE mix*
- *Often concentrated in mountainous areas*



Potential impacts from hydropower (1)

Impacts on species and habitats may vary depending:

- Individual characteristics of the river
- Physical and ecological state (already degraded or pristine)
- Type and scale of hydropower plant
- Species and habitats present

! Need to look at each facility on a case – by – case basis

! Important for operators / developers of HPP to have an understanding of the complexities of the riverine ecosystems

! This will improve the quality of the AA and the decision – making more straight forward

Potential impacts from hydropower (2)

Changes river morphology and riverine habitats

Loss, degradation and fragmentation of natural habitats and species

Significance: scale of impacts and rarity and vulnerability of habitats and species

Barriers to migration and dispersal of protected species

Rivers, lakes and riparian zones: important for dispersal and migration of freshwater species

Barriers (dams, artificial canals) can have important consequences for species survival

Disruption of sediment dynamics

Sediments: natural part of aquatic ecosystems - form a variety of habitats

Large reservoirs may trap 90% of incoming sediment – erosion downstream and local destruction

Accumulation of gravel can be detrimental for lithophile species and birds

Changes of the ecological flow regime

Impacts on aquatic habitats, fish migration upstream


Potential impacts from hydropower (3)

Water chemical and temperature changes (eg. construction of dams)

Injuries and killing of animals

Mortality 0-100% depending on the fish present, the type of HPP and mitigation measures used (100% mortality turbines of high – pressure plants)

Displacement and disturbance

Disturbance of species life cycles (inside or outside N2000) eg. ability to breed, feed, rest, disperse or migrate  serious impacts on their long survival in the region

Impacts on terrestrial species and habitats

Construction, decommissioning, renovation (roads, pipe routes, powerlines, etc)- death and significant disturbance

CUMULATIVE IMPACTS

Potential impacts from hydropower (4)

MAIN HYMO IMPACTS

HP type „In-stream plant“



- Ponding effect - change of river character
 - Reduced flow velocity
 - Altered sediment structure
 - Effects on temperature, O₂-household
- Bank fortifications
- Disruption of lateral connectivity, Disconnection of wetlands/floodplains



Migration barrier

Fish damage in turbines and screens

Deficits in sediment and groundwater connectivity

„Pondage operation“:
Flow pulses
(surge - downsurge effects)

So, how can we avoid all these?

Integrated Planning in order to link:

- National Renewable Action Plans
- River Basin Management Plans
- Conservation Objectives of Natura 2000 sites

Something that will help:

- Selecting the type of RE source
- Identifying the most suitable locations
- Deciding whether to renovate or develop new HPP
- Selecting the most appropriate project design

Appropriate Assessment (AA) - Art. 6(3) of Habitats Directive

- *Natura 2000: most valuable and endangered sp.&h.*
- *Procedures need to be rigorous to avoid undermining the objectives of nature Directives*
- *Decisions based on scientific evidence and expertise*
- *Delays due to poor quality of AA*
- *EIA / SEA/ WFD (art. 4.7) and HD (art. 6.3) : coordinated BUT cannot replace AA*

Stage 1: Screening

Is the plan or project (PP) directly connected with, or necessary to the management of the site for nature conservation purposes?

No

Yes

Is the PP likely to have significant effects on the site?

Yes

No

Stage 2: Appropriate assessment

Assess implications in view of the site's conservation objectives.

Assess cumulative and in-combination effects with other plans and/or projects.

Can it be concluded that the PP will not adversely affect the integrity of the site?

Yes

Authorisation may be granted

No

Can the negative impacts be removed e.g. through mitigation measures?

Yes

Redesign the plan or project

Are there alternative solutions?

Yes

Authorisation must not be granted.

No

**Stage 3:
Derogation: Article 6(4)**

Does the site host a priority habitat or species?

No

Yes

Are there imperative reasons of overriding public interest?

No

Authorisation must not be granted.

Yes

Authorisation may be granted provided adequate compensation measures are taken and the Commission is informed.

Are there human health or safety considerations or important environmental benefits?

Yes

No

Authorisation may be granted for other imperative reasons of overriding public, following consultation with the Commission. Compensation measures have to be taken.

Introduction of mitigation measures

Some examples:

- *Restoration of river continuity*
- *Fish passes*
- *Reduction of fish mortality- installation of screens at inlets*
- *Restoration of adequate ecological flow*
- *Monitoring systems to be established*

EC guidance document on Hydropower development and Natura 2000

- **Requirements** for hydropower in relation to Natura 2000 sites - **general principles**
- **Links with other legislative framework**
- Focus on:
 - **Article 6 of the Habitats Directive (Appropriate Assessment)** - step by step guidance for permitting procedure
 - **Existing hydropower** - opportunities with existing plants
 - **Potential interactions** between different types of hydropower plants and the river ecosystems
 - **Strategic and integrated approach** - benefits when planning new hydropower developments
 - **Mitigation measures**
- Demonstrate **good practices**
- Targeted to hydropower developers, authorities, practitioners, site managers, NGO's and other stakeholders concerned



State of play

January 2015 – 1st consultation on draft guidance document

Substantial amount of comments and reactions

July 2015 - Dedicated workshop – DG ENV

January 2017 – End of 2nd consultation

Currently under finalisation

Adoption by end of 2017