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

**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
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

- J02 Changes in water bodies conditions
- J03 Other changes to ecosystems
- H01 Pollution to surface waters
- I01 Invasive alien species
- A02 Modification of cultivation practices
- K03 Interspecific faunal relations
- F02 Fishing and harvesting aquatic resources
- A07 Use of ‘pesticides’ in agriculture
- D01 Roads, railroads and paths
- K02 Vegetation succession/Biocenotic evolution

State of Nature Report 2015
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
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)

<table>
<thead>
<tr>
<th><strong>Changes river morphology and riverine habitats</strong></th>
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</thead>
<tbody>
<tr>
<td>Loss, degradation and fragmentation of natural habitats and species</td>
</tr>
<tr>
<td>Significance: scale of impacts and rarity and vulnerability of habitats and species</td>
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<table>
<thead>
<tr>
<th><strong>Barriers to migration and dispersal of protected species</strong></th>
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</thead>
<tbody>
<tr>
<td>Rivers, lakes and riparian zones: important for dispersal and migration of freshwater species</td>
</tr>
<tr>
<td>Barriers (dams, artificial canals) can have important consequences for species survival</td>
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<tr>
<th><strong>Disruption of sediment dynamics</strong></th>
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<tr>
<td>Sediments: natural part of aquatic ecosystems - form a variety of habitats</td>
</tr>
<tr>
<td>Large reservoirs may trap 90% of incoming sediment – erosion downstream and local destruction</td>
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<tr>
<td>Accumulation of gravel can be detrimental for lithophile species and birds</td>
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<thead>
<tr>
<th><strong>Changes of the ecological flow regime</strong></th>
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<tr>
<td>Impacts on aquatic habitats, fish migration upstream</td>
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</table>
### Potential impacts from hydropower (3)

<table>
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<tr>
<th><strong>Water chemical and temperature changes (eg. construction of dams)</strong></th>
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<tr>
<td><strong>Injuries and killing of animals</strong></td>
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<tr>
<td>Mortality 0-100% depending on the fish present, the type of HPP and mitigation measures used (100% mortality turbines of high – pressure plants)</td>
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<tr>
<td><strong>Displacement and disturbance</strong></td>
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<tr>
<td>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</td>
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<tr>
<td><strong>Impacts on terrestrial species and habitats</strong></td>
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<td>Construction, decommissioning, renovation (roads, pipe routes, powerlines, etc)- death and significant disturbance</td>
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**CUMULATIVE IMPACTS**
Potential impacts from hydropower

- 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)
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

So, how can we avoid all these?
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
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

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<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
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<td>January 2015</td>
<td>1st consultation on draft guidance document</td>
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<td></td>
<td>Substantial amount of comments and reactions</td>
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<td>July 2015</td>
<td>Dedicated workshop – DG ENV</td>
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<td>January 2017</td>
<td>End of 2nd consultation</td>
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<td>Currently under finalisation</td>
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<td>Adoption by end of 2017</td>
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