

Policy Integration: Water Framework Directive and hydropower

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The role of hydropower in the EU

- **Hydropower secures electricity supply in EU:**
 - Share of net generating capacity year 2002: 19% (EU-25)
 - Share of electricity production year 2002: 11% (EU-25)
- **Hydropower helps reducing CO₂ emissions**
- **Hydropower is the best (and in many cases the only) energy source for balancing generation and for backing up intermittent sources**
 - ? Short time regulation is an essential feature of hydropower generation
- **Reservoirs and dams may have multi-purpose functions, e.g. flood protection and energy storage**

Hydropower causes hydromorphological changes

- **Constructing and operating hydropower plants (HPPs) usually changes the hydromorphology of a river significantly**
- **The impacts on ecology varies from case to case**
- **The impact area: upstream the extent of damming, downstream the extent of significant water level fluctuations followed by power generation**

Adverse effect on specific use

- WFD Article 4.3: Hydropower is one of the specific uses
- Adverse effect on hydropower:
 - loss of generation
 - loss of yearly or short term regulation capacity
 - *costs of required measures*
- What is a significant adverse effect?
- Rather small losses at individual HPPs could cause significant total losses at national/regional level, e.g.:
 - 2 % bypass flow in every Scandinavian HPP equals 4,6 TWh/a
 - RES target for hydro in Finland is increase of 1,2 TWh/a

To judge what is HMWB is a difficult testing procedure –

all water bodies directly affected by hydropower should be subject to testing for HMWB classification

Reference Conditions, MEP

MEP, Maximum ecological potential

- Values of biological quality elements reflect as far as possible those of the nearest comparable WB type, taken into account the changed physical conditions (WFD Ann. V 1.2.5)
- On the values of hydromorphological quality elements the only impact are those resulting from HMWB characteristic once all mitigation measures have been taken (WFD Ann. V 1.2.5)

Environmental objective, GEP

GEP, Good ecological potential

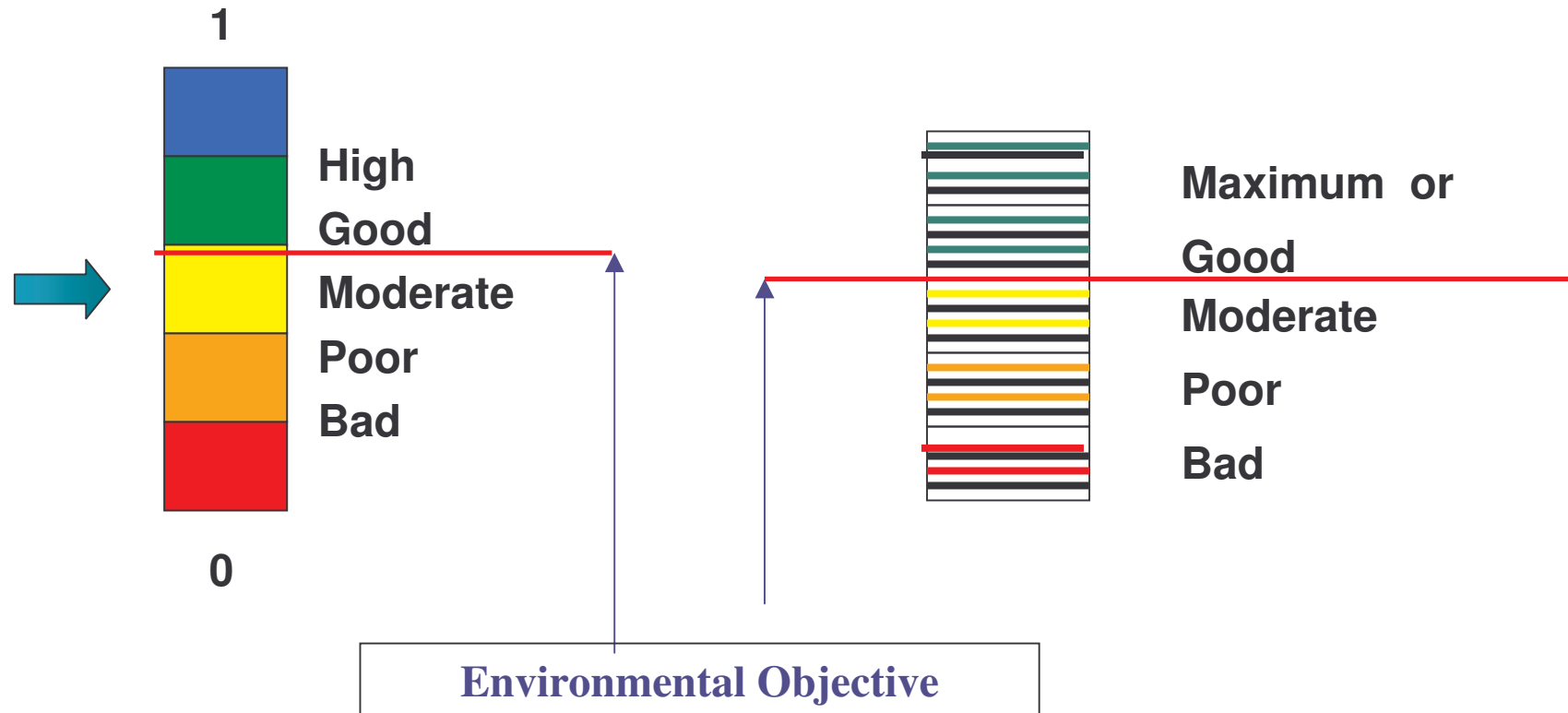
- Slight changes in the values of biological quality elements compared to the values found at MEP (WFD Ann. V 1.2.5)
- Condition consistent with achievement of the values specified for biological quality elements (WFD Ann. V 1.2.5)
- ***Difference between MEP and GEP is the same as difference between HES and GES***

Natural Waters

Heavily Modified or Artificial Waters

Ecological Status

Ecological Potential



Defining MEP

OPTION 1: defining the impacts of hydromorphological changes

- nearest comparable natural WB
 - values for relevant biological quality elements,
 - values for physico-chemical quality elements
- given the physical conditions of HMWB
 - . modelling, expert judgement etc

OPTION 2: defining the effects of mitigation measures

Other HMWB, status close to MEP or HMWB itself

- all hydromorphological mitigation measures not yet undertaken
- modelling, expert judgement etc

Environmental objective, GEP

- Classification into 5 classes, the best two: GEP and MEP reported together
- Measures to gain GEP (or GES)
 - Measures should be cost effective (WFD ANNEX III)
 - Measures should be technically feasible
 - Measures should improve the ecology
 - There are not any common measures suitable for every HMWB

EURELECTRIC key messages

- All water bodies directly affected by hydropower should be subject to testing for HMWB classification
- Result of testing could be that WB affected by hydropower generation is in good status, but if not:
HMWB should be seen as a category of its own with the objective of good ecological potential
- The most transparent way to define MEP is to start from the values of biological quality elements in existing HMWB
- Any proposed measure to achieve GEP must be cost-effective

Thank you for your attention!

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