

GEP or not GEP?

- A Finnish Approach for Assessing the Status of HMWB (Hydropower Focus)**

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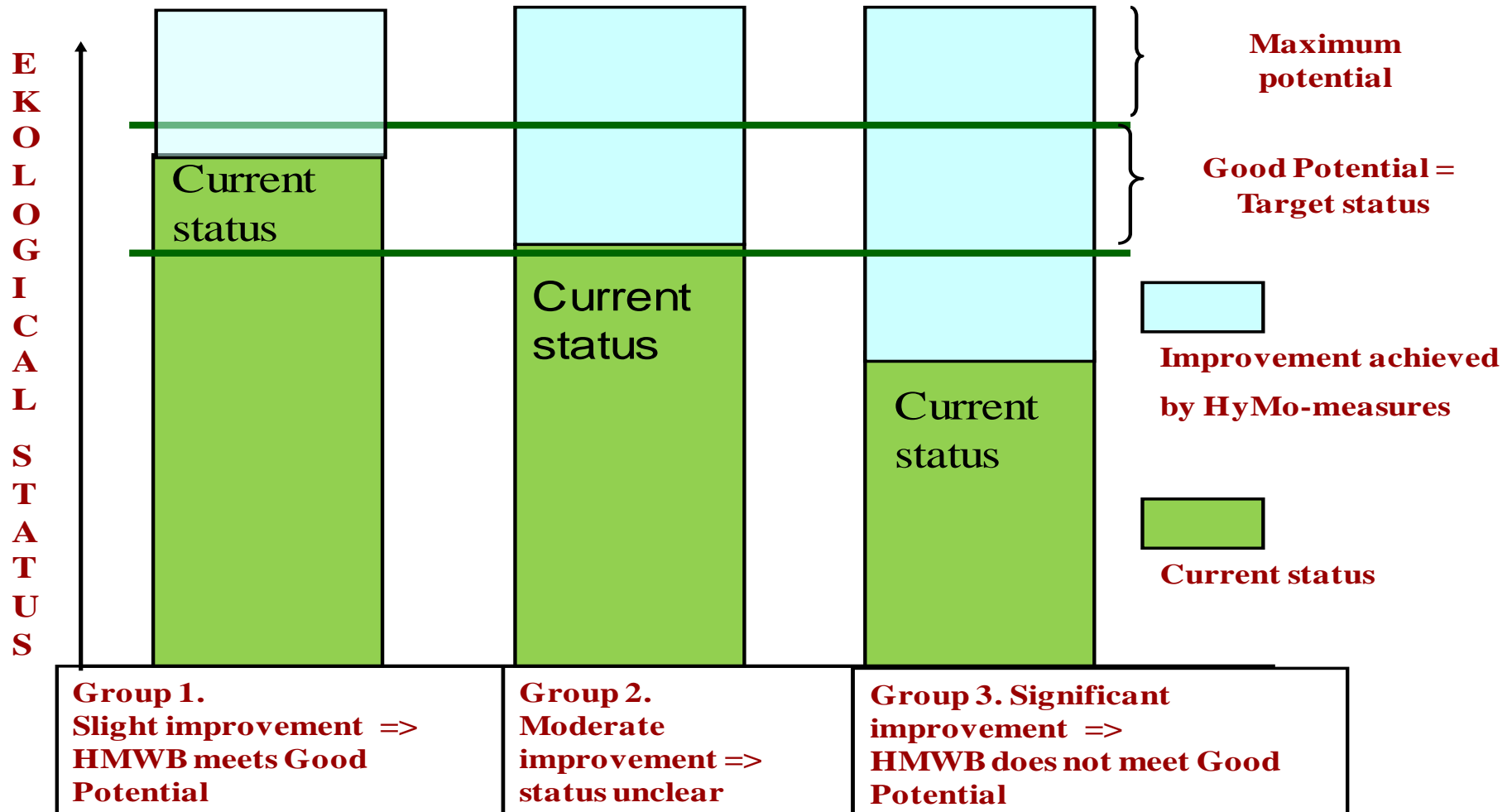
Finnish Environment Institute, SYKE

HMWB workshop 12.3.2009, Brussels

The approach

- The process includes the identification of potential and feasible hydro-morphological mitigation measures and the assessment how much they improve the current ecological status (=> MEP)
- The biological conditions in MEP are not explicitly described. The focus is to assess the order of magnitude of the mitigation measures' impacts.
 - Slight (=small), moderate and significant improvement
- Based on the analysis the WBs are grouped in followingly:
 1. Water body is already in GEP
 2. Unclear situation: water body may or may not be in good ecological potential
 3. Water body is not yet in GEP

The connection between the positive ecological impacts of HyMo-measures and the status of HMWBs

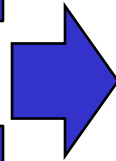


GEP "test" in HMWBs

– water quality and hydromorphology

1) Will water quality be in good status 2015?

2) Will feasible hydro-morphological measures improve considerably ecological status?



GEP

- WQ: Yes & HM: No

NOT GEP

- WQ: No & HM: No

- WQ: Yes & HM: Yes

- WQ: No & HM: Yes

HYDROMORPHOLOGICAL "TEST"

TASK 1: Identify all hydro-morphological mitigation measures which improve the ecological status and do not have significant adverse effect on uses.

TASK 2: Assess the impacts of chosen mitigation measures on relevant biological quality elements, different uses of water course and costs.

TASK 3: Develop a reasonable combination(s) of mitigation measures which do not have significant adverse impacts on uses and which improve ecological status as much as possible.

TASK 4: Define the cumulative ecological overall impacts of the chosen measures, and assess which is the most appropriate group:

1. No or slight positive ecological impact
2. Moderate positive ecological impact
3. Significant positive ecological impact

Group 1

GEP is already achieved

No mitigation measures are required

Group 2

Uncertain situation
GEP may be not achieved

Undertake the further assessment or wait for the results of monitoring

Group 3

GEP is probably not achieved

Undertake cost-efficient mitigation measures

TASK 1: Identify all hydro-morphological mitigation measures which improve the ecological status and do not have significant adverse effect on uses.

Measure to improve the status of the River Kalajoki	Does the measure cause significant adverse effects on specific use?		Fish	Bottom fauna	macrophytes	Water quality	combination of measures in phase 3
	Yes	No					
Fishways to HPPs. Discharge 0,5 m ³ /s. Used for 5 month/year.		X					
Fishways to HPPs, Discharge 0,5 m ³ /s. Used for 3 month/year.		X					
By-pass channels to the HPPs. Discharge of 1 m ³ /s through the year.	X						
Stopping the short time regulation completely.	X						
Stopping the short-time regulation during June-August.	X						

TOTALLY 15 DIFFERENT MEASURES WERE CONSIDERED IN THE KALAJOKI CASE

TASK 2: Assess the impacts of chosen mitigation measures on relevant biological quality elements on scale 1-5.

Measure to improve the status of the River Kalajoki	Does the measure cause significant adverse effects on specific use?		Estimation of the effects the measure on the biological quality elements and water quality("1">40%, "2" 20-40%, "3" 20%, "4"1-5%, "5"<1%)				measures in phase 3
	Yes	No	Fish	Bottom fauna	Macrophytes	Water quality	
Fishways to HPPs. Discharge 0,5 m ³ /s. Used for 5 month/year.		x	4	5	5	5	
Fishways to HPPs, Discharge 0,5 m ³ /s. Used for 3 month/year.		x	5	5	5	5	
By-pass channels to the HPPs. Discharge of 1 m ³ /s trough the year.	x		4	4	5	5	
Stopping the short time regulation completely.	x		4	4	5	5	
Stopping the short-time regulation during June-August.	x		4	4	5	5	

TASK 3: Develop a reasonable combination of mitigation measures which do not have significant adverse impacts on uses and which improve biological quality elements as much as possible.

Measure to improve the status of the River Kalajoki

Does the measure belong to the combination of measures in phase 3

Fishways to HPPs. Discharge 0,5 m³/s. Used for 5 month/year.		x	4	5	5	5		X
Fishways to HPPs, Discharge 0,5 m³/s. Used for 3 month/year.		x	5	5	5	5		
By-pass channels to the HPPs. Discharge of 1 m³/s trough the year.	x		4	4	5	5		
Stopping the short time regulation completely.	x		4	4	5	5		
Stopping the short-time regulation during June-August.	x		4	4	5	5		

Chosen measure: Fishways to HPP, used 5 months in a year

Estimation of the effects of measure combination to the biotic quality on the following scale ("1">40%,"2" 20-40%,

Fish	Bottom fauna	Macrophytes
4	5	5

TASK 4: Assess the cumulative ecological overall impacts of the chosen measures, and assess which is the most appropriate group

RESULT

GROUP 1: The chosen combination of measures has only slight improving effects on the ecological status. The HMWB meets good ecological potential (HyMo-test).

X

GROUP 2: The chosen combination of measures has moderate improving effects on the ecological status. It is unclear whether the HMWB meets Good Ecological Potential or not (HyMo test).

GROUP 3: The chosen combination of measures has significant improving effects on the ecological status. The HMWB does not meet good ecological potential (HyMo test).

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Experiences - Strengths

- The method is quick and can be used even in cases where the data is limited
- Fairly rough estimates lead to quite reliable and believable results
 - Obvious cases and uncertain cases can be identified
- The method provides a good framework for discussions in the working groups and coordination groups
 - Easy to notice measures which are considered
 - It is possible to make "relevant" "comments about
 - Significant impact to hydro power production
 - The impacts of considered measures on ecology

Experiences - Weaknesses

- Expert judgment and subjective evaluations play an important role as the biological data is scarce and the biological response to mitigation measures is uncertain
 - Deviation in the assessment in different RBDs.
- Defining maximum ecological potential (= identifying feasible measures) is problematic.
 - There are no clear criteria for significant adverse impact.
- The method seems to be simple. However, understanding the assumptions behind the approach requires deep understanding of WFD.
- As the result is tentative, it is important try to find agreement about the current situation and required measures in the RBDs.

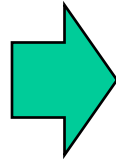
Conclusions - HMWB/rivers have been target of intense discussion

- Ministry of environment and fisheries authorities:
 - In the GEP the ecological continuum is required in the rivers which have the potential to produce migratory fish stocks having high national or regional importance
 - Without emphasizing the importance of migratory fish nearly all HMWBs would have been directly in GEP, 40 % improvement in ecological status is very strict.

- Power companies:
 - The achievement of the GEP should be based on the classification system and assessment of the ecological improvements based on the national classification system for the rivers.
 - A moderate proportion of the type specific species are absent or of very low abundance in moderate status of fish fauna. The applied “salmon out – all out” principle is in controversy with this.

Result of the Kalajoki case

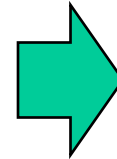
1) Will water quality be in good status 2015?



NO

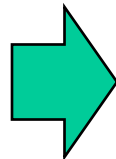


NOT
GEP



Carry out cost-efficient mitigation measures, also HyMo measures possible

2) Will feasible hydro-morphological measures improve considerably the ecological status?



NO

Tentative scale for the assessment of mitigation measures

Slight => GEP	If the changes in the values of biological quality elements are less than 10 %.
Moderate => UNCERTAIN	If the changes in the values of biological quality elements are 10-40 %.
Significant => NOT GEP	If the changes in the values of biological quality elements are > 40 %.

The Basis of Classification, Finnish National Guidance

- **Maximum potential is current status + the improvement on the values of biological quality elements achieved by carrying out the HyMo – measures, which all together do not have significant adverse effects on specific use**
- **If all practical HyMo – measures improve the values of biological quality elements less than 40 %, the current status of WB meets Good Potential**

Maximum Ecological Potential	80-100 %
Good Ecological Potential	60-80 %
Moderate Ecological Potential	40-60 %
Poor Ecological Potential	20-40 %
Bad Ecological Potential	0-20 %