

GEP or not GEP?

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

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WFD.....**

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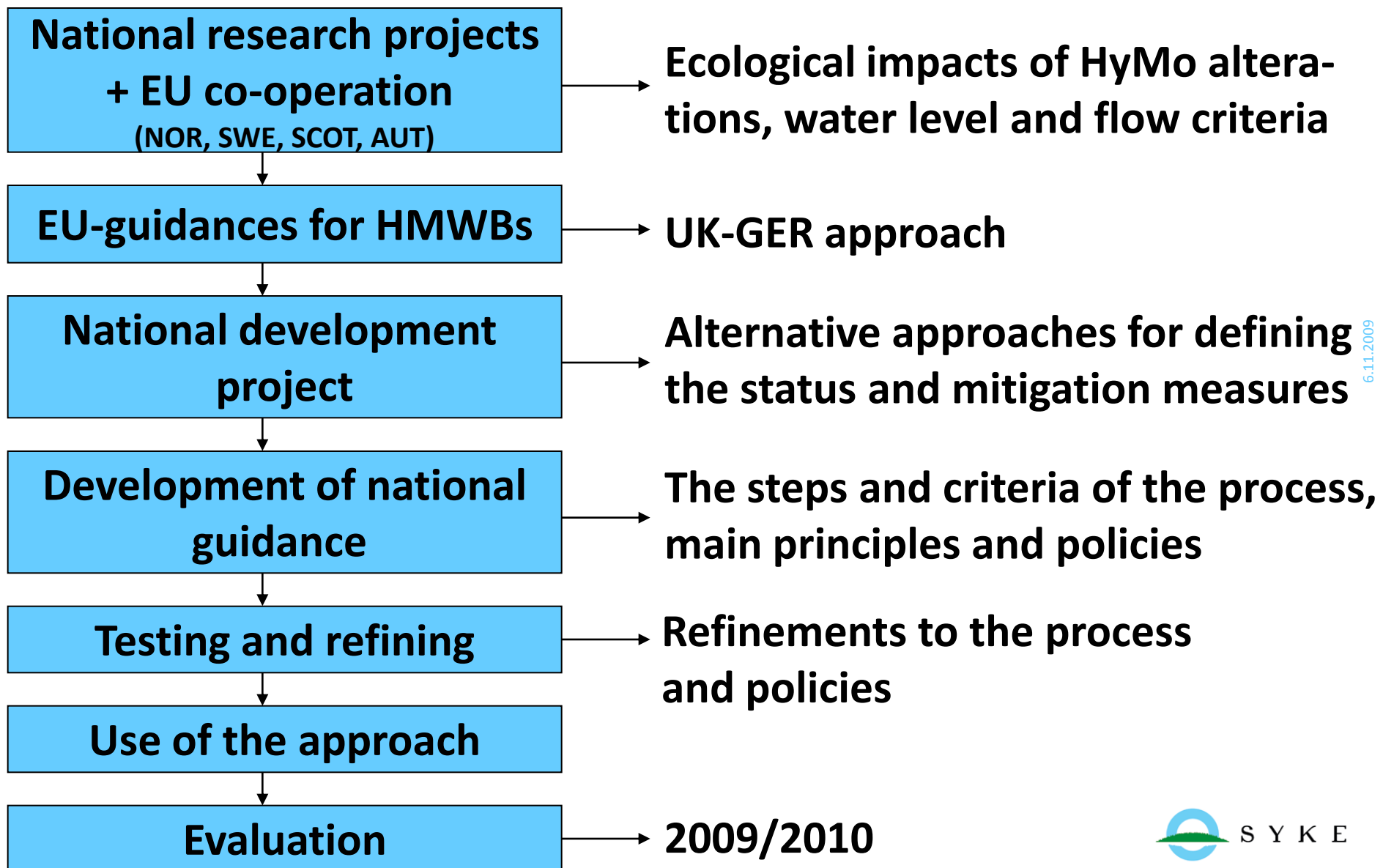
Content

- Background
- Approach
- Discussion of major issues
- Conclusions

Background for the approach

- Need for transparent process and harmonized principles
 - 6 river basin districts & 13 regional environment centres
- Need to identify WBs where mitigation measures are required.
 - It is not possible to realize all potential measures in all WBs
 - Key question: is the environmental objective (GEP) already achieved?
- The approach was developed in SYKE in a close co-operation with regional authorities and interest groups
 - A national guidance for designation and HyMo alterations was compiled
- Several alternative approaches were developed, tested and evaluated

PROCESS - a continuum of projects

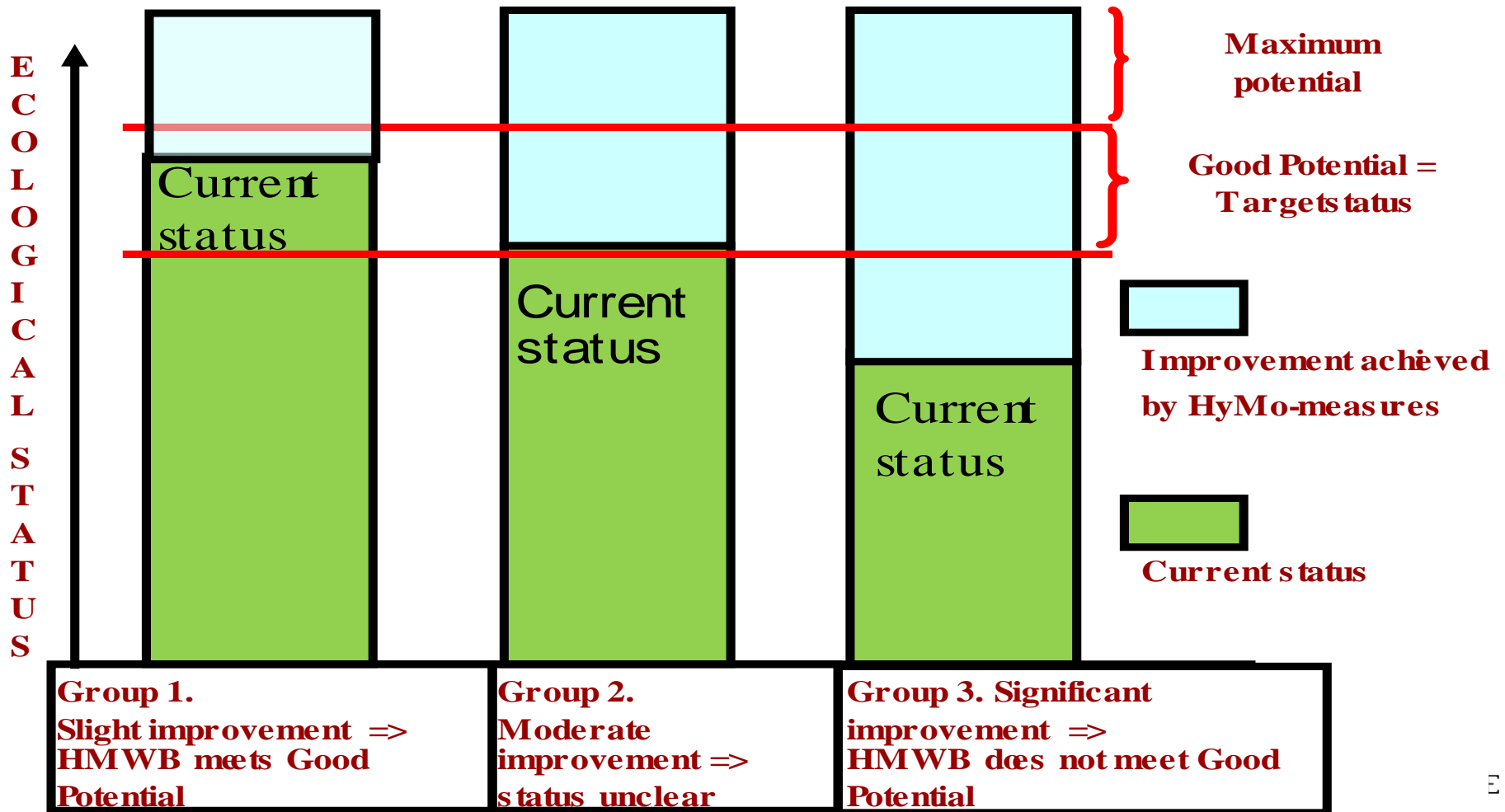


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Main principles of Finnish approach

- 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 are not described in EQRs. 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 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

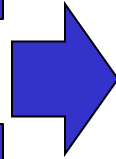


GEP "test" in HMWBs

– water quality (WQ) and hydromorphology (HM)

1) Will water quality be in good status 2015?

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



GEP

- WQ: Yes & HM: No

NOT GEP

- WQ: Yes & HM: Yes

- WQ: No & HM: Yes



HyMo test will be described in further details in slides 9-

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 together do not have significant adverse impacts on uses and which improve ecological status as much as possible.

TASK 4: EVALUATE 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	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).

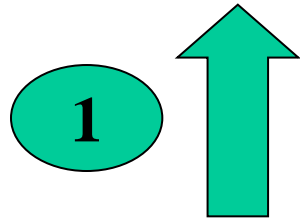
X

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).

E

Defining GEP - two direction issue

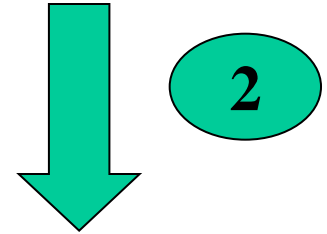


What are the criteria of significant adverse impact on uses?

It defines what mitigation measures are included when defining MEP

**IMPROVEMENT
DUE TO MEASURES**

**CURRENT
ECOLOGICAL
STATUS**



What is the threshold value between GEP and less than GEP?

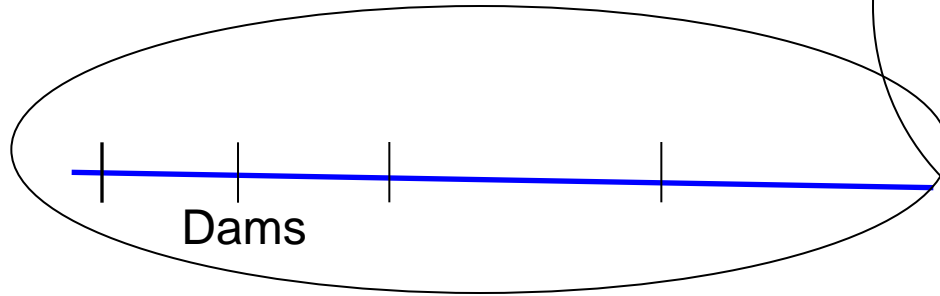
It defines whether mitigation measures are required

There should be linkage between these two issues

E.g. if the criterion for significant adverse impact is high (big losses for hydro power generation is accepted) then it is logical that the deviation between MEP and GEP is greater than in the case where the significance criterion has a lower value.

Critical issue: ecological continuum

WB1: Heavily modified



WB2: Natural

WB1: Good status not possible to achieve due to the hydro power development
=> GEP or not?, do fishways improve significantly ecological status? river classification system does not give specific value for natural reproduction

WB2: In good ecological status according to river classification system

=> However, salmon and sea trout are missing, local fish (> 10 species)
ok

PRELIMINARY RESULT...: Both WBs achieve environmental objectives

**..... DID NOT MATCH OPINIONS OF ENVIRONMENTAL AND FISHERIES
AUTHORITIES**

Solution for the problem?

- New concept: significant river for migratory fish was defined (SRMF)
- New target: in SRMFs the achievement of environmental objectives require ecological continuum
- New problem arise: when the river is SRMF?
 - General definition: valuable migratory fish stocks exist or possible to restore
 - Hydro power companies criticized this concept because it raises the environmental objective to MEP in SRMFs
- Due to the tight timetable SRMF has not yet been enough considered in RBMPs
- A national fishway strategy which is under preparation will hopefully give support for this.

Conclusions

- 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.
- The method seems to be simple. However, understanding the assumptions behind the approach requires deep understanding of WFD.
 - There are only few people who really are familiar with HMBW issues
- As the result is tentative, it is important try to find agreement about the current situation and required measures in the RBDs.
- HMWBs are not a separate issue and the choices made should be in accordance with the classification work, for instance.

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 %