Summary – HMWB sesion

HMWB in Norden

- We have much of the same challenges
- Hydropower seems to be the most important reason for HMWB
  - At least this is focus in the first planning cycle
  - ..and Iceland do only have MWB

Significant adverse effect

- 5-20 % loss in hydropower may be accepted in Sweden
  - But need to be tested in court
    - Costly and timeconsuming for managment
- Not estiated in Finland
- Austria seems to have a more exact suggestion here
  - But not yet decided

National HMWB guidelines

- Sweden:
  - On it's way ....mainly a quite general guide...Vattenmyndighetene the one who need to do it in practice and sort things out?
- Finland:
  - Stepwise approach
  - Restoration coefficient – the clue to find GEP
- Iceland:
  - Due to political reasons only MWB....

Statistics – 30-Apr-08

- Heavily modified rivers
  - 75 WB, average length 32 km
  - + 2 artificial water body
  - so far 1770 WB as total....
- Arficial lakes
  - 25 WB, average size 24.5 km^2
- Heavily modified lakes
  - 34 WB, average size 28,0 km^2
  - so far 5227 WB as total...

Step by step approach

- 1) Evaluate ecological status based on water quality, phytoplankton (lakes) or diatoms (rivers)
  - Change quality class into number
  - High = 0.9, Good = 0,7, Moderate = 0.5, Poor = 0.3, Bad = 0,1
- 2) Estimate the effects of hymo-measures on macrophytes, benthic invertebrates and fishes
- 3) Determinate a coefficient of the effects of restoration measures
  - Limited effects (0,9 – 1)
  - Moderate effects (0,7 – 0,8)
  - Significant effects (0,5 – 0,6)
- 4) Finally evaluate critically the possibilities to do the measures

STEP 2. IMPACTS OF SINGLE HYDRO-MORPFOLOGICAL MEASURES

HyMO measure	Does the measure cause significant adverse impacts on the important use of the water course ?		Estimate of the impacts of the measure on quality factors ("1">40%,"2" >25-40%,"3" 10-25%,"4"2-10%, "5"<2%)				Does the measure belong to the combination of measures chosen in phase 3
	Yes	No	Fish	Zoobenthos	Macrophytes	Water quality	
Measure 1							
Measure 2							
Measure 3							
Measure 4							
Measure n							

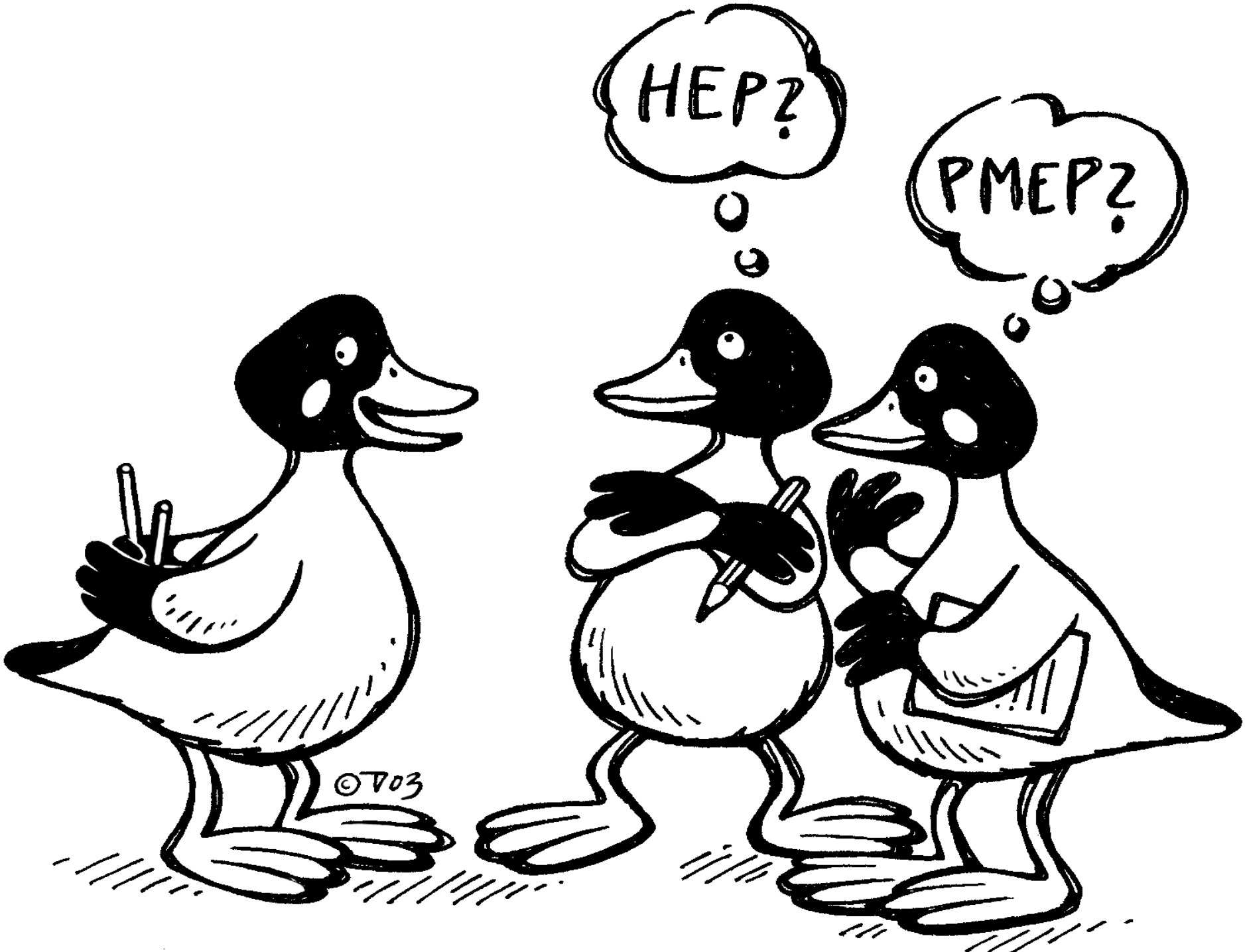
SCALE		
Score	Description	Percent chane
1	Very high	>40 %
2	High	>25-40%
3	Moderate	>10-25 %
4	Slight	>2-10%
5	None	0-2 %

M1 Fishway with 0.5 m3/s, three months - no

M2 By-pass-channel with 1 m3/s, all the time - yes

M3 No short-term-regulation - yes

	Example 1: Hydropower river with fish way All possible hymo measures done, Ecological data consists of water quality and phytobenthos	Example 2: Small hydropower river Fish fauna could be improved by fish ways and restoration measures, littoral vegetation can be improved by changed regulation practices	Example 3: River used for timber floating No hymo Restoration measures done, shores eroding and rapids cleaned
Water quality	0.7	0.7	0.7
Phytobenthos	0.7	0.7	0.7
Restoration coefficient	1	0.75	0.5
Calculated ecological status*	0.7 * 1 = 0,7 GOOD (EP)	0.7 * 0.7 = 0.49 MODERATE	0.7 * 0.5 = 0.35 POOR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