

Water Framework Directive & Hydromorphology

Alternative Objectives

David Corbelli

Senior Hydro-Ecologist, SEPA

Presentation Structure

- WFD - Alternative objectives
- Heavily Modified Water Bodies
- UK developments & implementation
- EU activity on Hydromorphology

Objective setting



Alternative Objectives

Article/s

4. 3. Heavily Modified Water Bodies

4. 4. Extended deadlines

4. 5. Less stringent objectives

4. 7. Deterioration due to new modifications

Link to environmental objectives

“Other pressures” such as engineering work can:

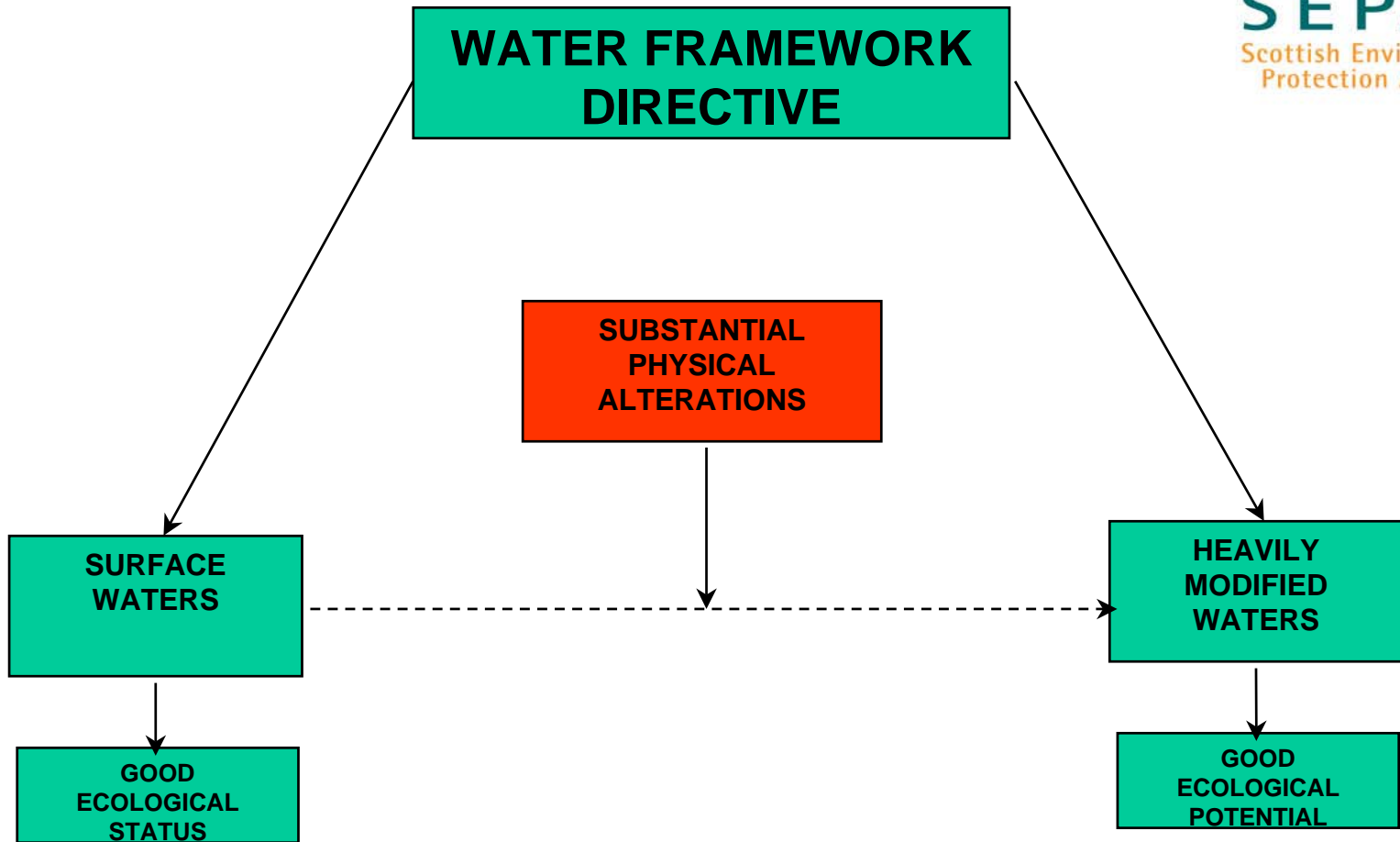
- affect biology or chemistry preventing the achievement of good status;
- directly cause deterioration from high status.



The regulatory regime should insure that any environmental damage is minimised.

HMWB's





NAVIGATION

FLOOD DEFENCE

HYDROPOWER

WATER SUPPLY

AGRICULTURE

URBANISATION

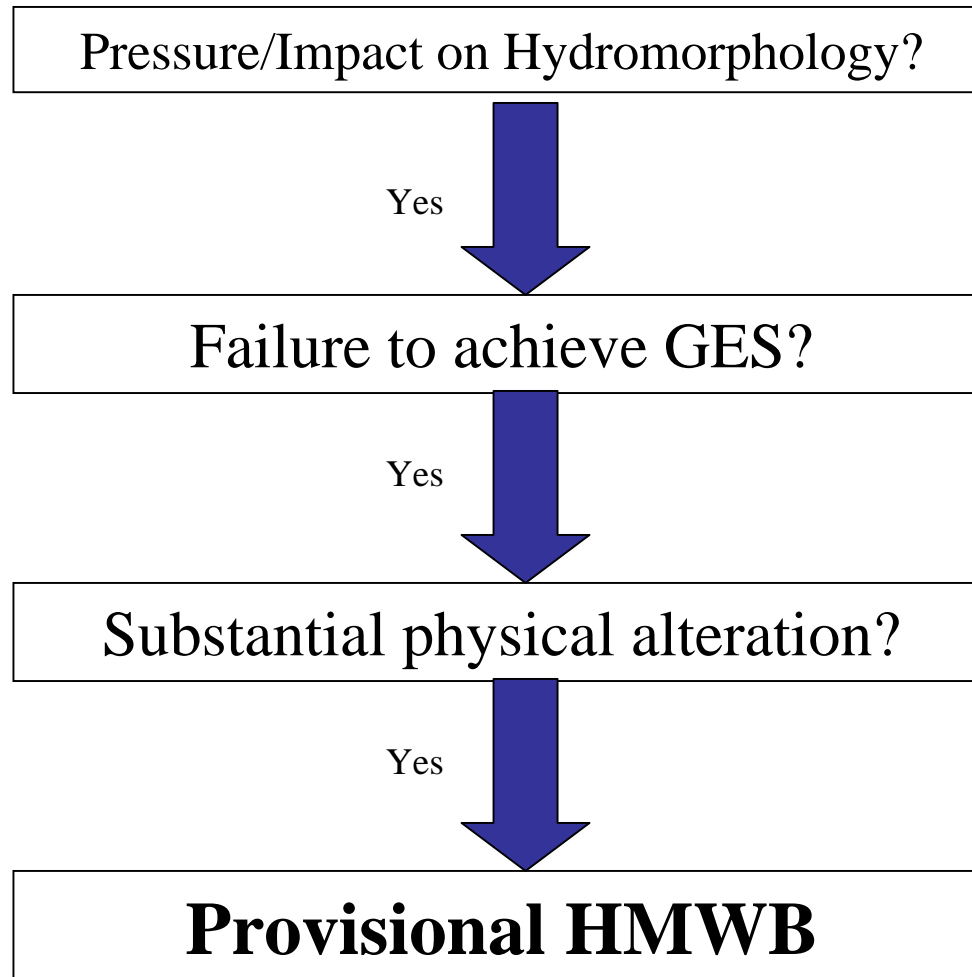
Article 4 (3) – Designation of Heavily Modified Water Bodies

4(3). Member States may designate a body of surface water as artificial or heavily modified, when:

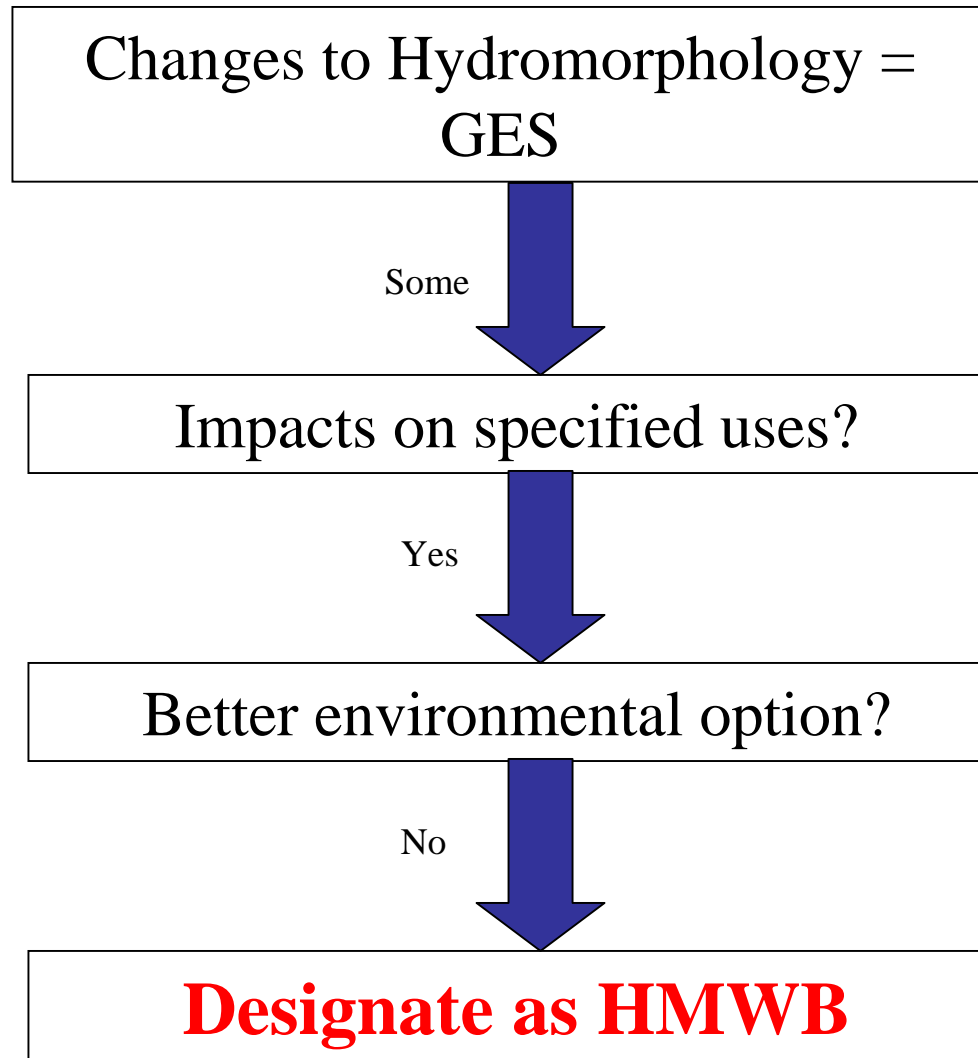
- **(a) the changes to the hydromorphological characteristics of that body which would be necessary for achieving good ecological status would have significant adverse effects on:**
 - (i) the wider environment;**
 - (ii) navigation, including port facilities, or recreation;**
 - (iii) activities for the purposes of which water is stored, such as drinking-water supply, power generation or irrigation;**
 - (iv) water regulation, flood protection, land drainage, or**
 - (v) other equally important sustainable human development activities**

- **(b) the beneficial objectives served by the artificial or modified characteristics of the water body cannot, for reasons of technical feasibility or disproportionate costs, reasonably be achieved by other means, which are a significantly better environmental option.**

HMWB Designation process



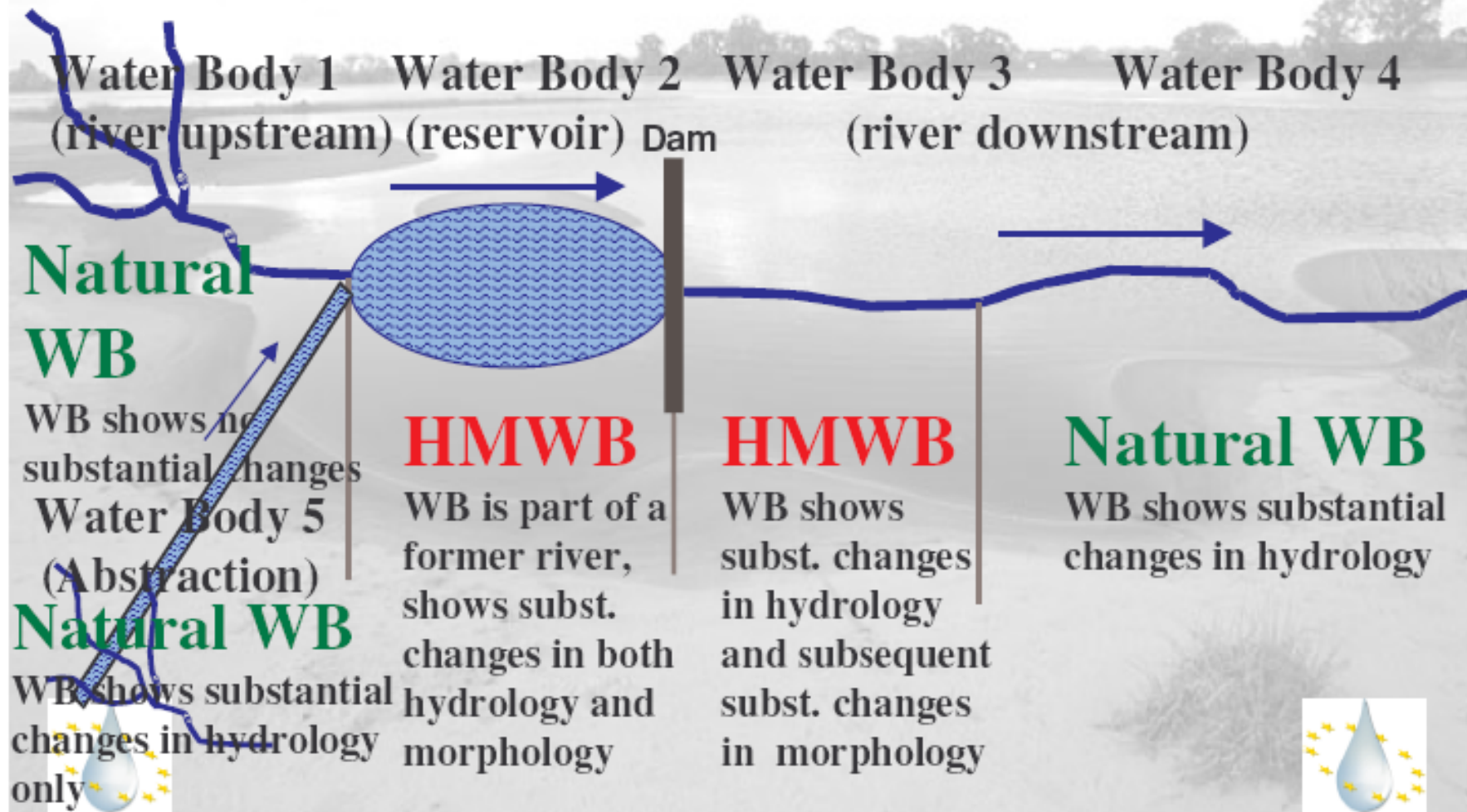
HMWB Designation process



4. 7. Deterioration due to new modifications

- All practicable steps are taken to mitigate the adverse impact on the status of the water environment;
- The scheme is of overriding public interest and/or the benefits to the environment and to society of protecting the water environment from deterioration of status are outweighed by the benefits of the scheme to human health, to the maintenance of human safety or to sustainable development;
- The beneficial objectives served by the scheme cannot for reasons of technical feasibility or disproportionate cost be achieved by other means, which are a significantly better environmental option; and
- The reasons for the scheme are specifically set out and explained in the River Basin Management Plan and the objectives are reviewed every 6 years.

Substantial changes in both hydrology and morphology



UK developments & implementation

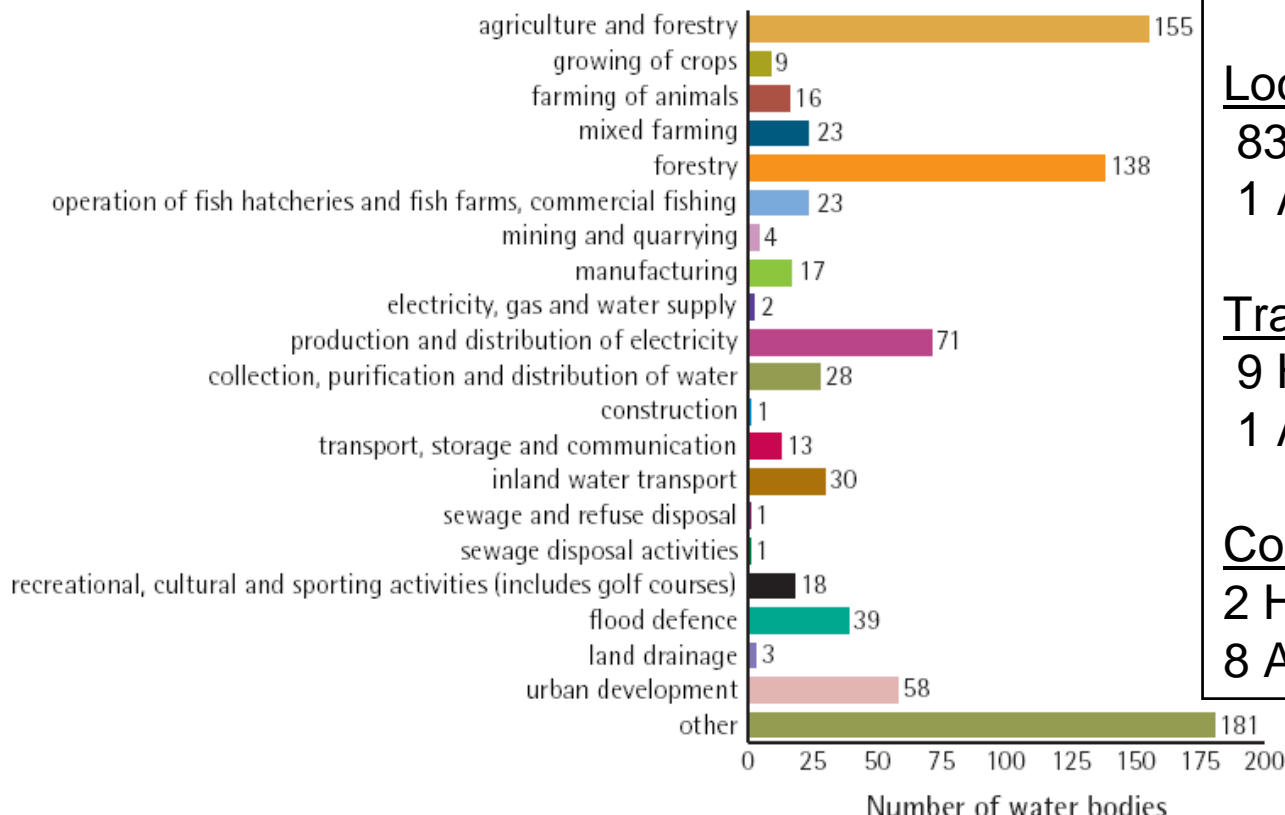
Table 17: River water bodies affected by morphological alterations

	Reporting category	Number of water bodies	% of number	Length (km)	% of length
Rivers	1a	275	13.7	2712	13.0
	1b	392	19.6	4427	21.3
	2a	146	7.3	1638	7.9
	2b	1192	59.5	12045	57.9
Total		2005	100	20822	100
Total at risk	1a + 1b	667*	33.3	7139	34.3

*A total of 227 and 29 river water bodies have been provisionally identified as HMWB and AWB, respectively. Canals are AWB.



Figure 14: General industry sectors affecting 1a and 1b river water bodies (morphological alterations)



Rivers (2384)

258 (10.8%) HMWB
29 AWB (1.2%)

Lochs (334)

83 HMWB (24.8%),
1 AWB (0.30%)

Transitional (50)

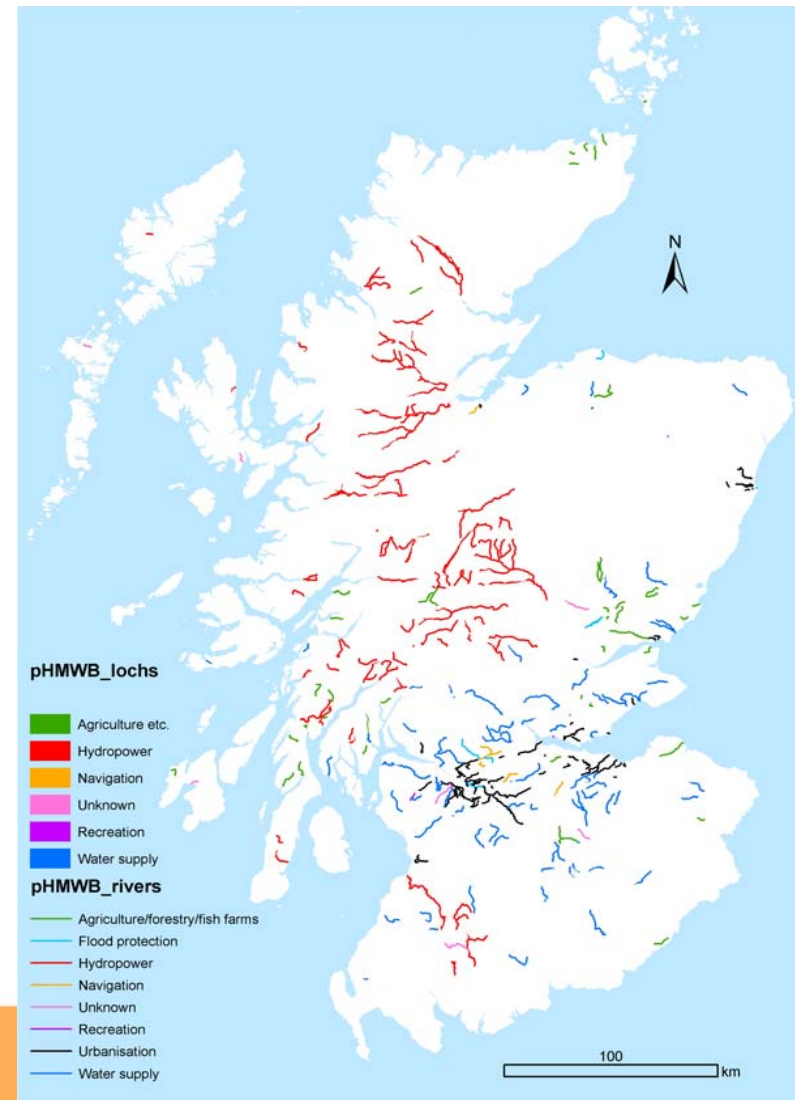
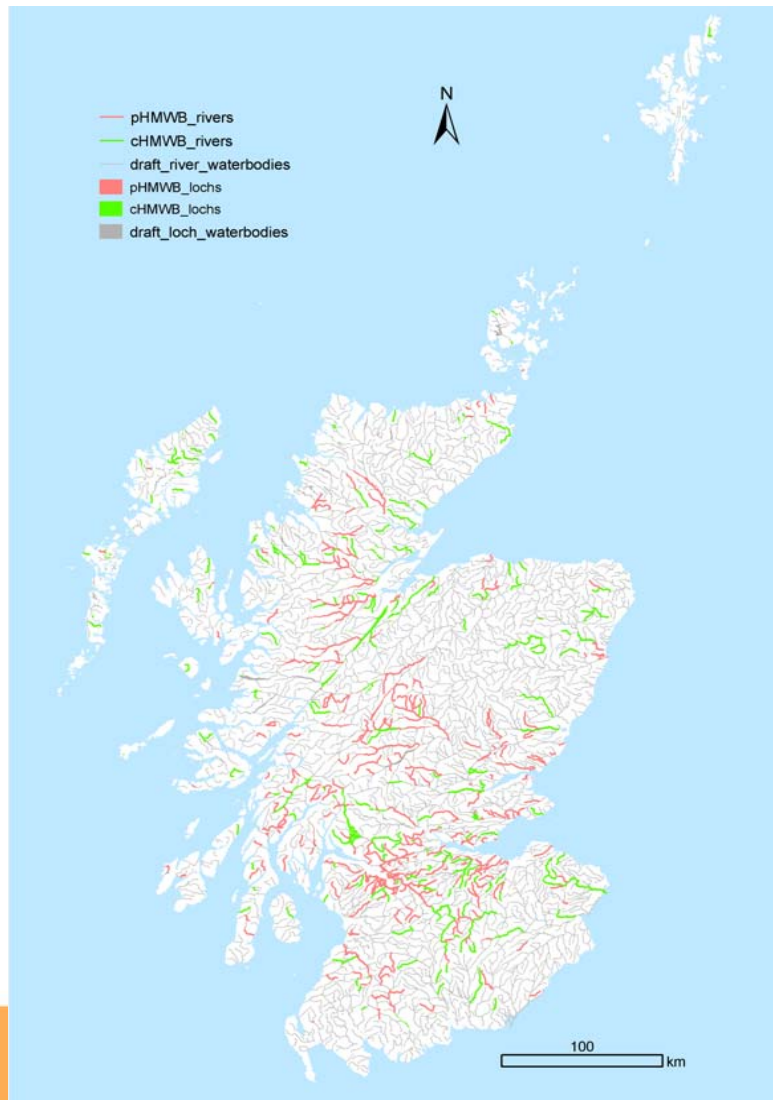
9 HMWB (18%),
1 AWB (2%)

Coastal (457)

2 HMWB (0.44%),
8 AWB (1.75%)

Characterisation – Morphology

Risk Assessments



HMWB's - Future Work (2005+)



Validation of Risk Assessments

- River Habitat Survey (RHS)
- Geomorphological survey
- Engineering
- Catchment pressures

Provisional designation of HMWB's in SWMI report (obvious HMWB's)

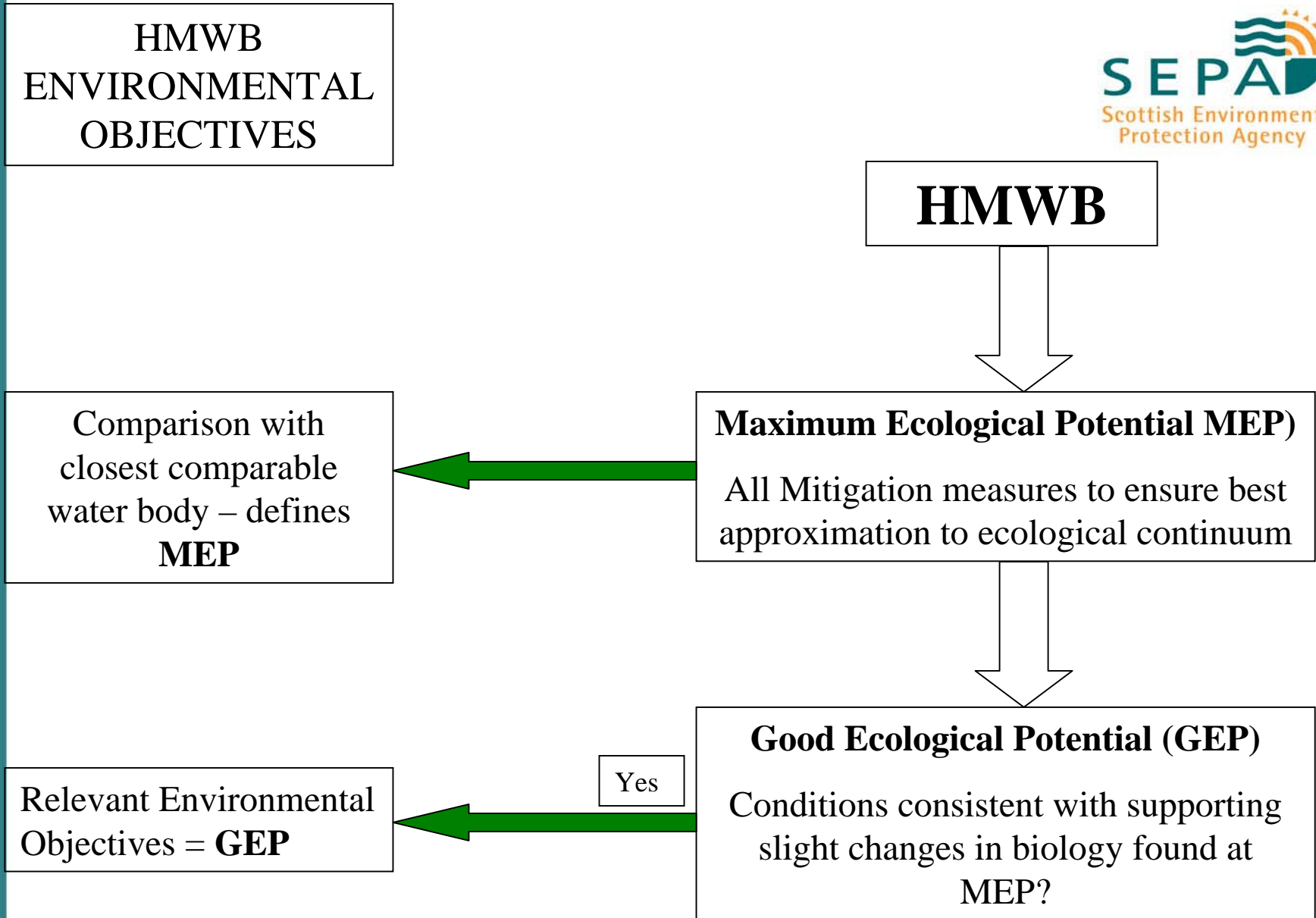
Assessment of restoration/mitigation potential/options (SWMI & draft RBMP)

Application of designation assessment (proformas and guidance developed for draft RBMP)

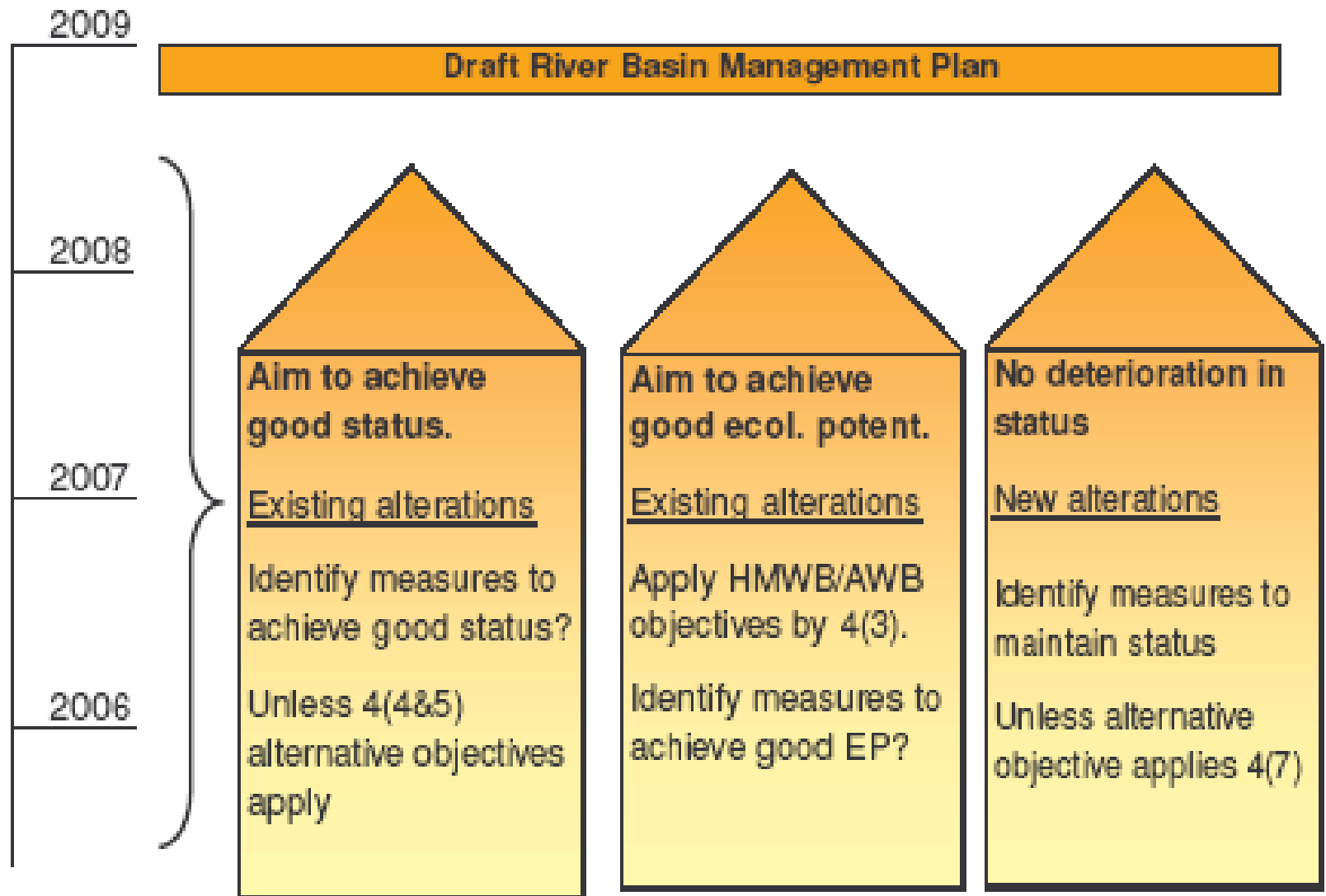
Heavily Modified & Artificial Water Bodies



Environmental Objectives



Alternative objectives = measures



Aim to achieve GEP

HMWB/AWB 4(3) tests can be complied with



Identify measures which do not have a significant adverse impact upon use

Good ecological potential achieved by 2015

Good ecological potential not achieved by 2015

Identify mitigation measures to deliver 4(4&5) alternative objectives

Existing HMWB guidance on defining MEP/GEP

Output from 3 working groups identifies that the existing guidance on how to define MEP/GEP needs to be refined.

2. Define MEP on the basis of all mitigation measures by taking the nearest equivalent comparable WB.

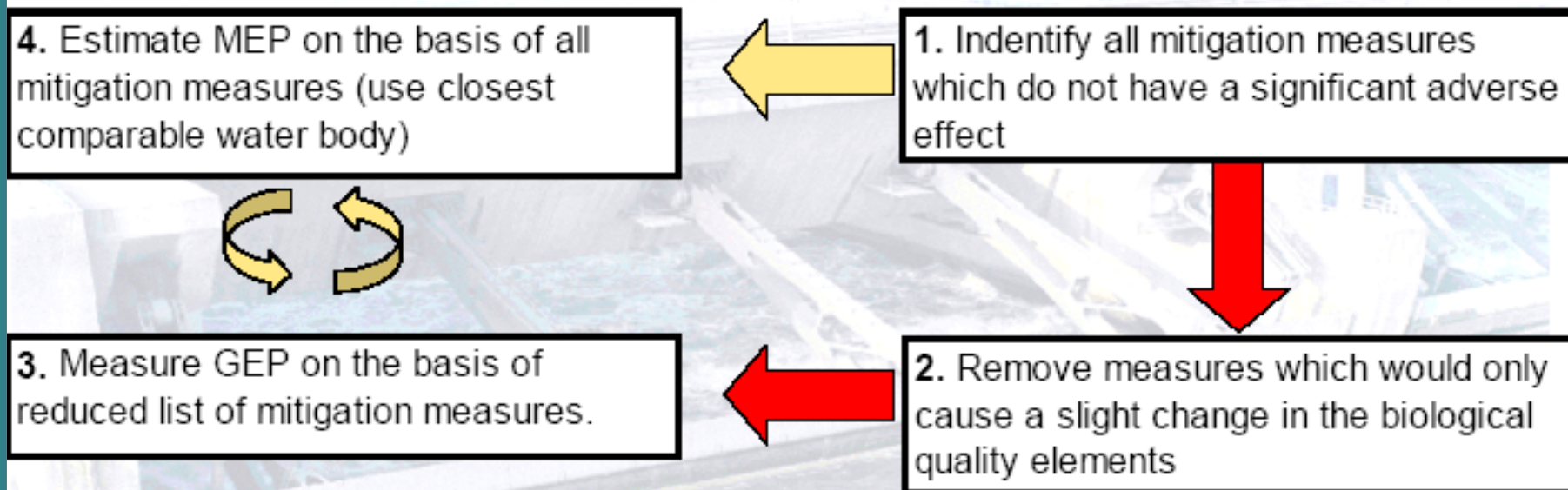
1. Identify all mitigation measures which do not have a significant adverse effect

3. Define GEP by allow slight changes in biological quality elements (GEP)

4. Define measures which will deliver GEP

Proposed guidance on defining MEP and GEP

Proposal will ensure that process is practical and can be delivered on time.



“GEP is not a “stand alone” objective but is defined by the mitigation measures compatible with the use” (Hydropower II).

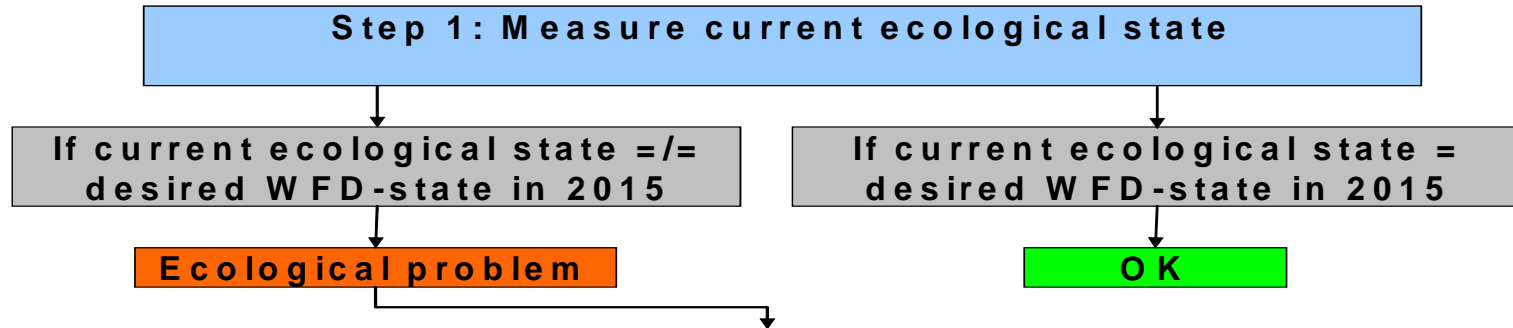
Mitigation measures and MEP/GEP

Current and proposed projects

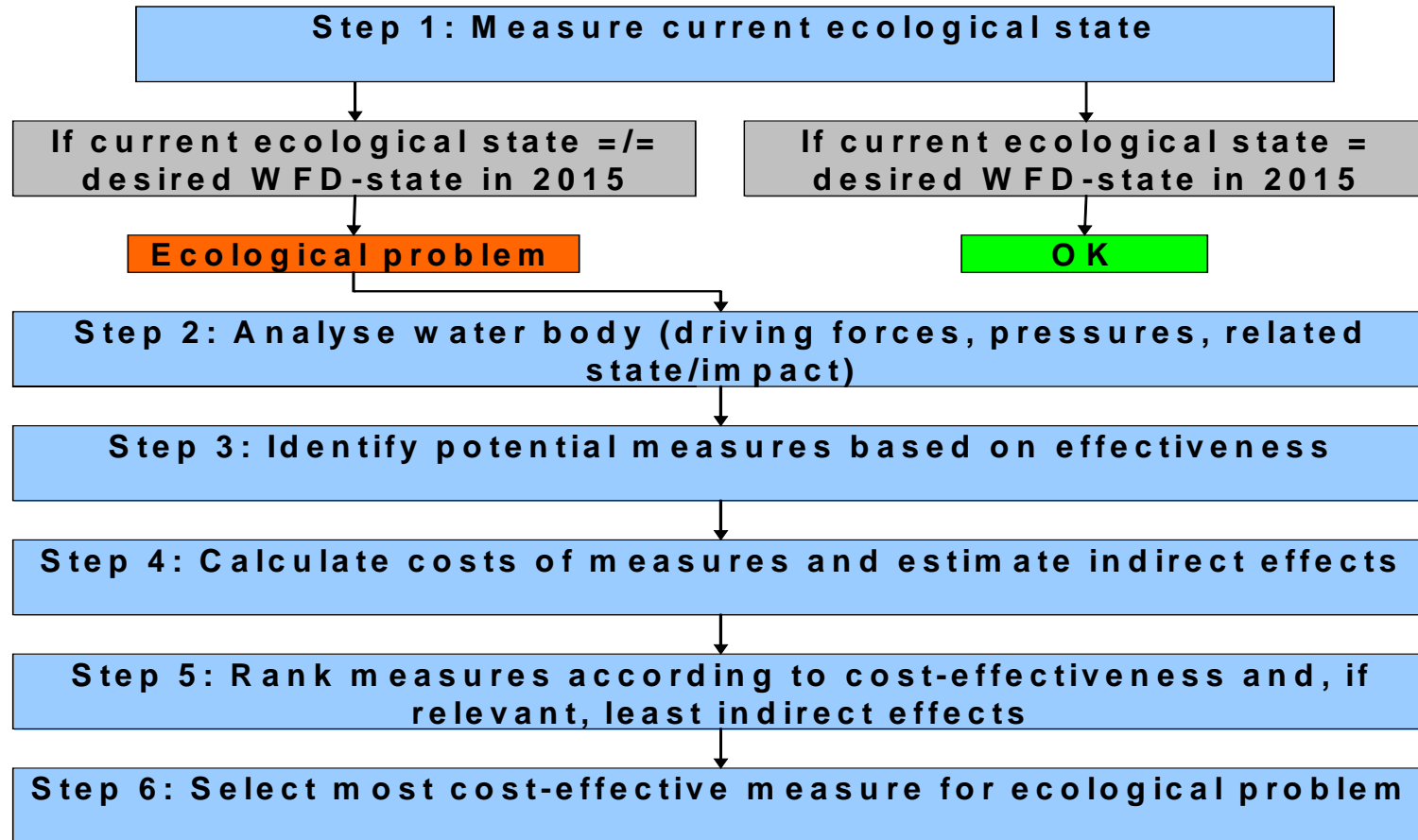


- EA/SNIFFER – Designation and best practice for HMWB's
- SNIFFER WFD 29 – Best Practice for Impoundments
- SNIFFER WFD 75: Application of the WFD exemption tests to new hydropower schemes likely to result in deterioration of status
- Guidance on the evidence required to justify disproportionate cost decisions under the Water Framework Directive

Approach for selecting measures

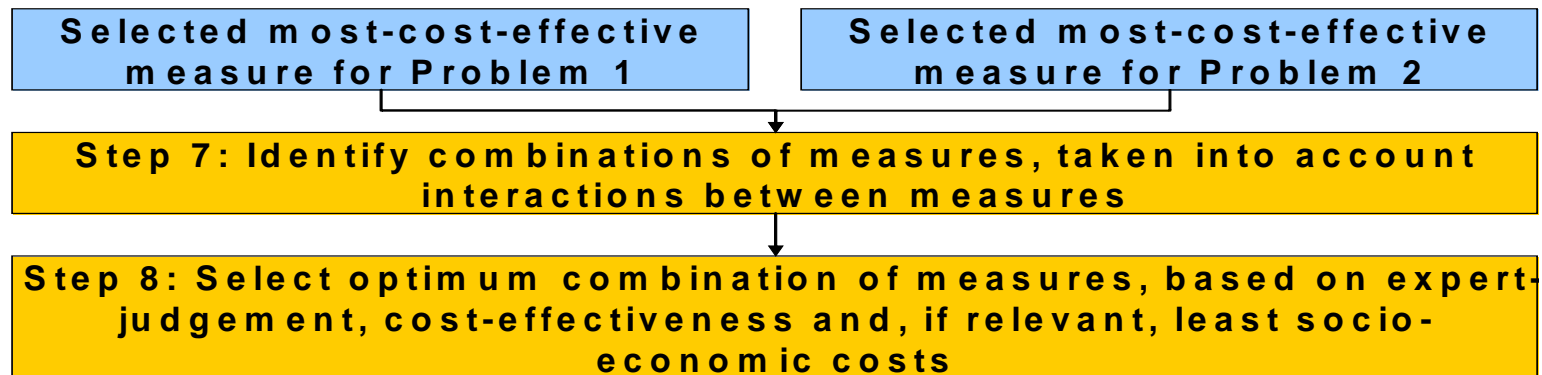


Approach for selecting measures



Step 6: Identify alternative packages

- Often, a combination of measures will be required:
More than one problem needs to be solved by more measures
Two small different measures may have more effect than one big measure to solve the problem



Interaction between measures

- Interactions between measures have to be taken into account
 - Basic information is aimed to be provided in the database on interactions
 - Expert judgement is essential
- Example of interaction
 - Combination: restocking of native fish species, riparian habitat restoration and flow regulation downstream*
 - The combination addresses the pressure (altered flow downstream) as well as the current state of river channel and biological element (fish)*
 - Restocking or riparian habitat restoration alone is less effective, especially in the long term*

Conclusions

- WFD29 Project will propose a structured cost-effectiveness analysis for impoundments projects to fulfil WFD-requirements
- Database with information that can be used for making cost-effectiveness analyses
- Importance of expert judgement to arrive at best selection of measures



- EU CIS activity on Hydromorphology
- Prague workshop October 2005
- Policy and technical follow up activities