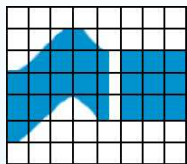


Implementation of the European Water Framework Directive and Consequences for Freshwater Biodiversity

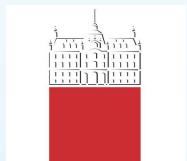
Gorazd URBANIČ



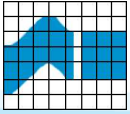
IzVRS - Institute for Waters of the Republic of Slovenia

and

**University of Ljubljana, Biotechnical Faculty,
Dept. of Biology**

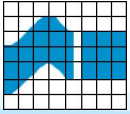


Gorazd.Urbanic@bf.uni-lj.si



Outline

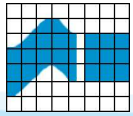
1. **Levels of Biodiversity**
2. **Water Framework Directive (WFD) and freshwater biodiversity; “large scale approach”**
3. **WFD; a freshwater biodiversity aspect**
4. **WFD implementation milestones**
5. **Summary**



Biodiversity

Levels of biodiversity

1. **Genetic diversity** - diversity of genes within a species
2. **Species diversity** - diversity among species in an ecosystem
3. **Ecosystem diversity** - diversity at the ecosystem level. Variety of ecosystems.



WFD and Biodiversity; large scale approach

WFD



Surface waters and groundwaters

Natural and artificial water bodies

Freshwater Biodiversity

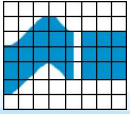
Not mentioned directly, but...

...need to use bio-indicators, but...

...only four freshwater groups...and

...only in surface waters

Main WFD environmental objective; protection of surface waters and groundwaters

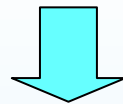


WFD implementation; biodiversity aspect

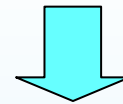
WFD



Freshwater Biodiversity

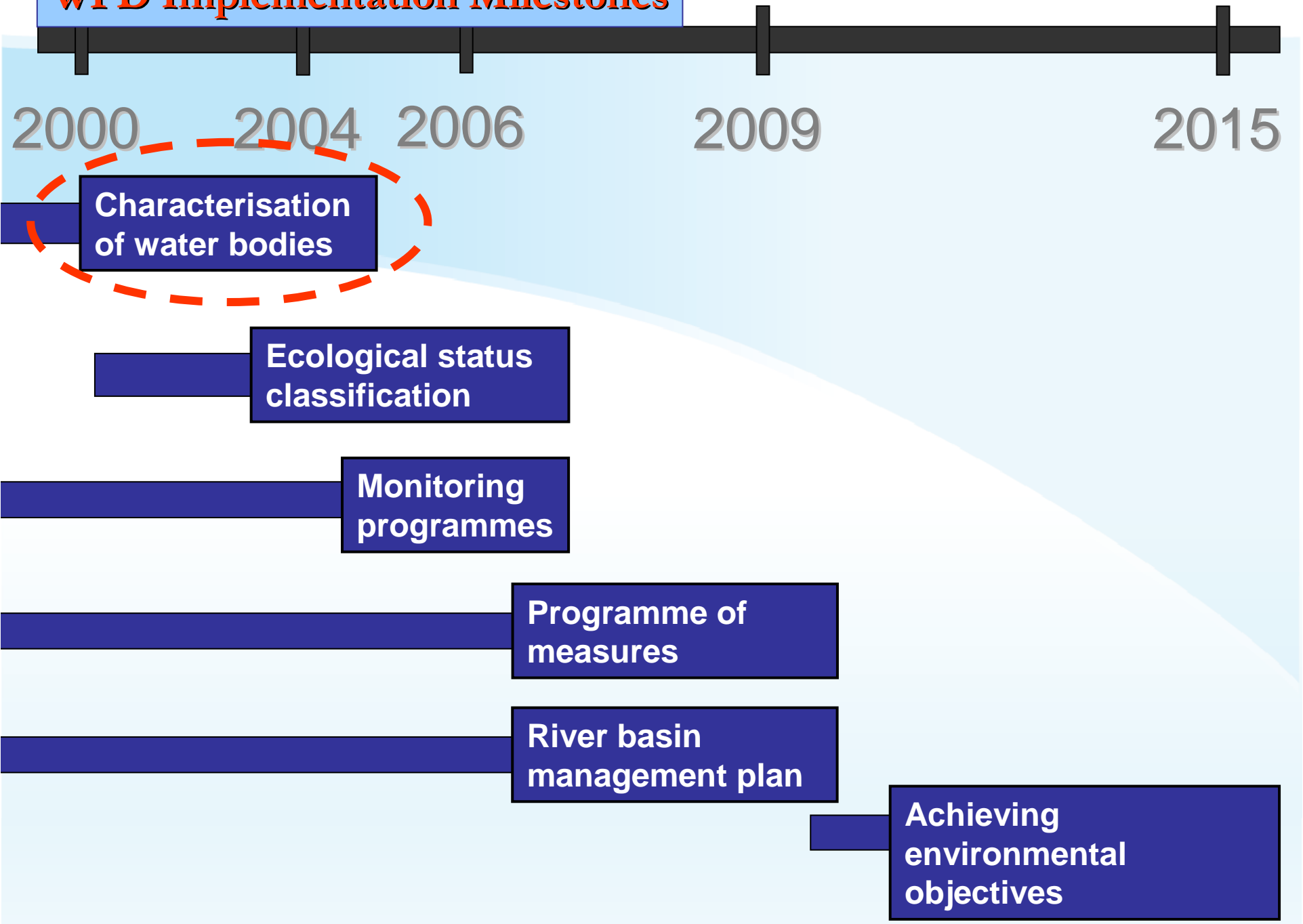


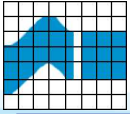
New data



Protection

WFD Implementation Milestones





Milestone 1; Characterisation of surface water

WFD Article 5 and Annex II

1. Typology

2. Type-specific reference conditions

3. Identification of pressures and impacts

Ecosystem diversity

Natural WB

Heavily modified WB

Artificial WB

>10 km²

Rivers

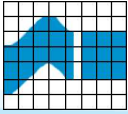
Lakes

>50 ha

Transitional waters

Coastal waters

Small water bodies
are not considered!



Ecosystem diversity; River typology

SLOVENIA: area 20273 km²

4 ecoregions

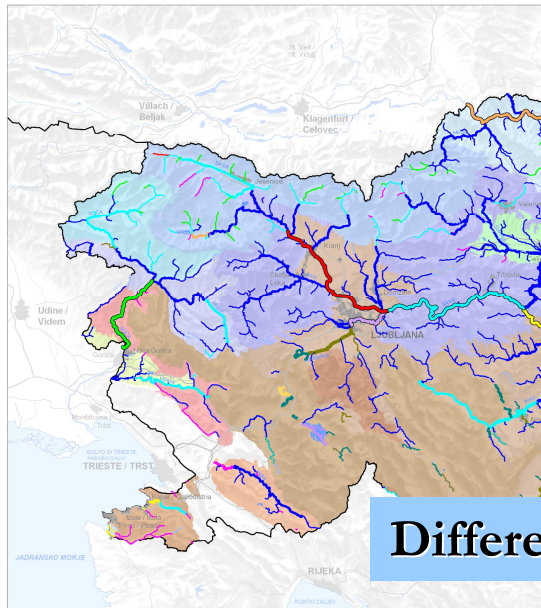
GERMANY: area 357021 km²

3 ecoregions + 4 types

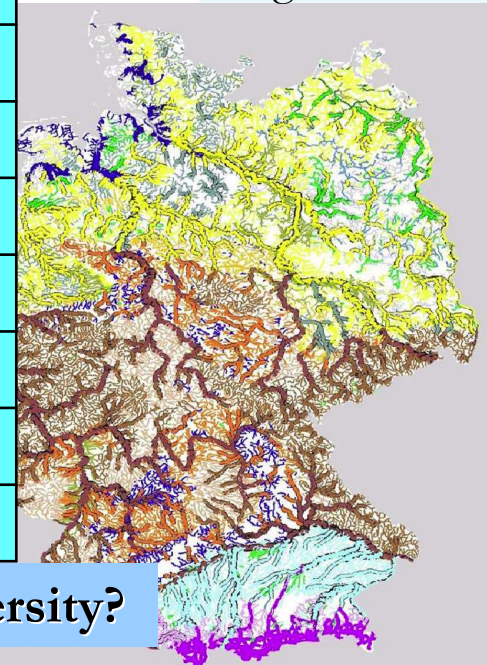
73 river types (Urbanič 2007)

24 river types (Sommerhäuser & Pottgiesser 2003)

KARTA 3: Bioregije in velike reke s tipi rek



Country	No. river types
France	124
Poland	26
Germany	24
Czech Republic	53
Netherlands	22
Slovenia	73
Luxembourg	6



Difference in the river ecosystem diversity?

WFD Implementation Milestones

2000

2004

2006

2009

2015

Characterisation
of water bodies

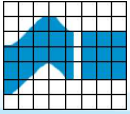
Ecological status
classification

Monitoring
programmes

Programme of
measures

River basin
management plans

Achieving
environmental
objectives



Milestone 2; Ecological status classification

WFD Article 7 and Annex II

1. Ecological assessment

Biological elements

Composition, abundance, biomass and age structure

Phytoplankton

Phytobenthos and Macrophytes

Benthic invertebrates

Fish

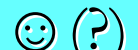
2. Classification

3. Intercalibration

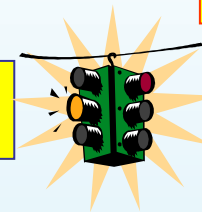


1. High
2. Good
3. Moderate
4. Poor
5. Bad

Species diversity



Why species level?



WFD Implementation Milestones

2000

2004

2006

2009

2015

Characterisation
of water bodies

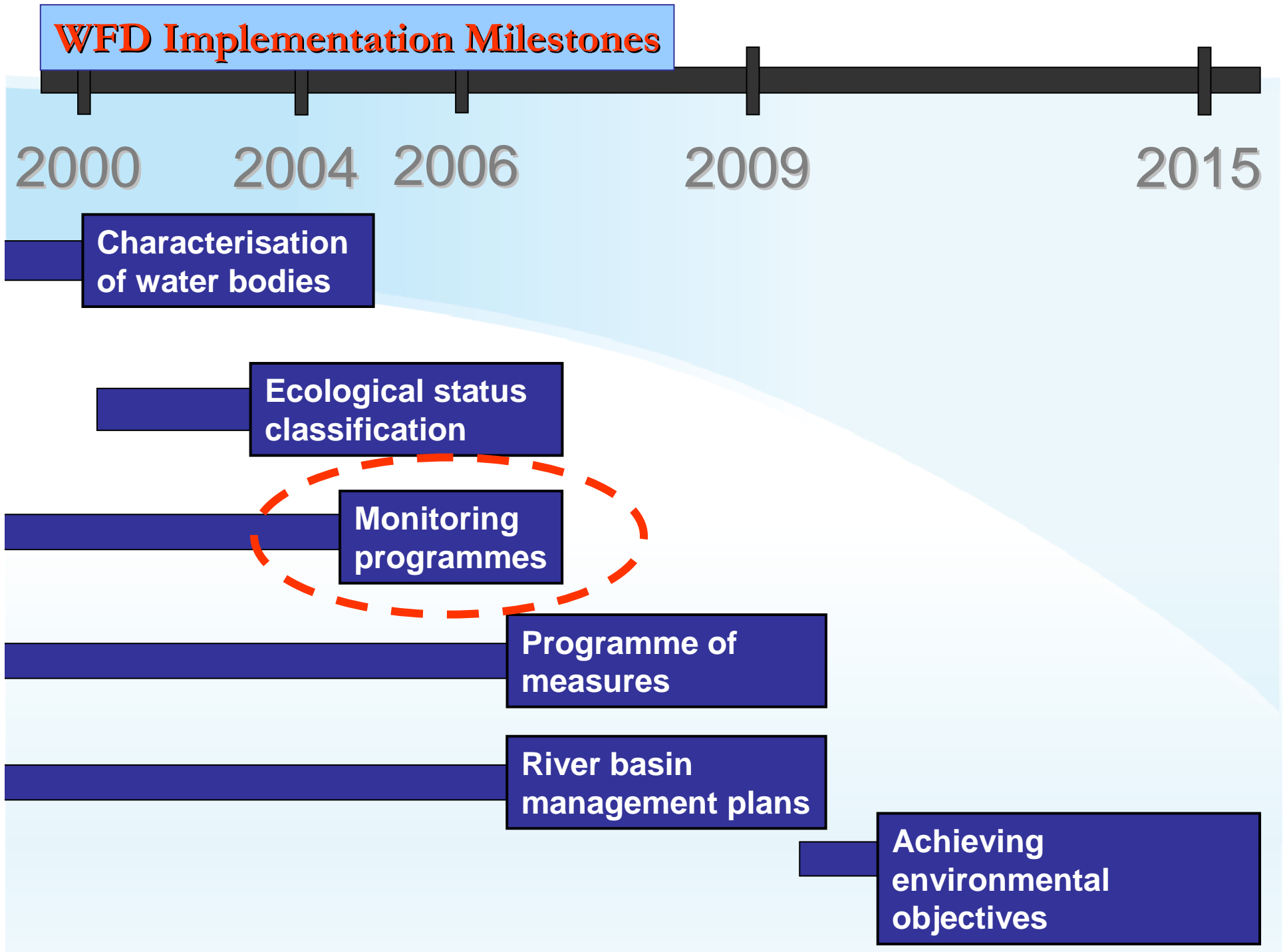
Ecological status
classification

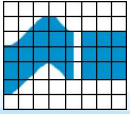
Monitoring
programmes

Programme of
measures

River basin
management plans

Achieving
environmental
objectives





Milestone 3; Monitoring programmes

WFD Article 8
and Annex V

Monitoring

Surveillance

All BQE

- few water bodies
- at least once in six years

Operational

Selected BQE

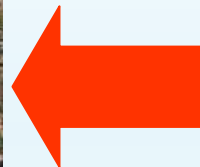
- water bodies at risk

Investigative

All or selected BQE

- few water bodies

Data mostly from moderate, poor and bad sites.



WFD Implementation Milestones

2000

2004

2006

2009

2015

Characterisation
of water bodies

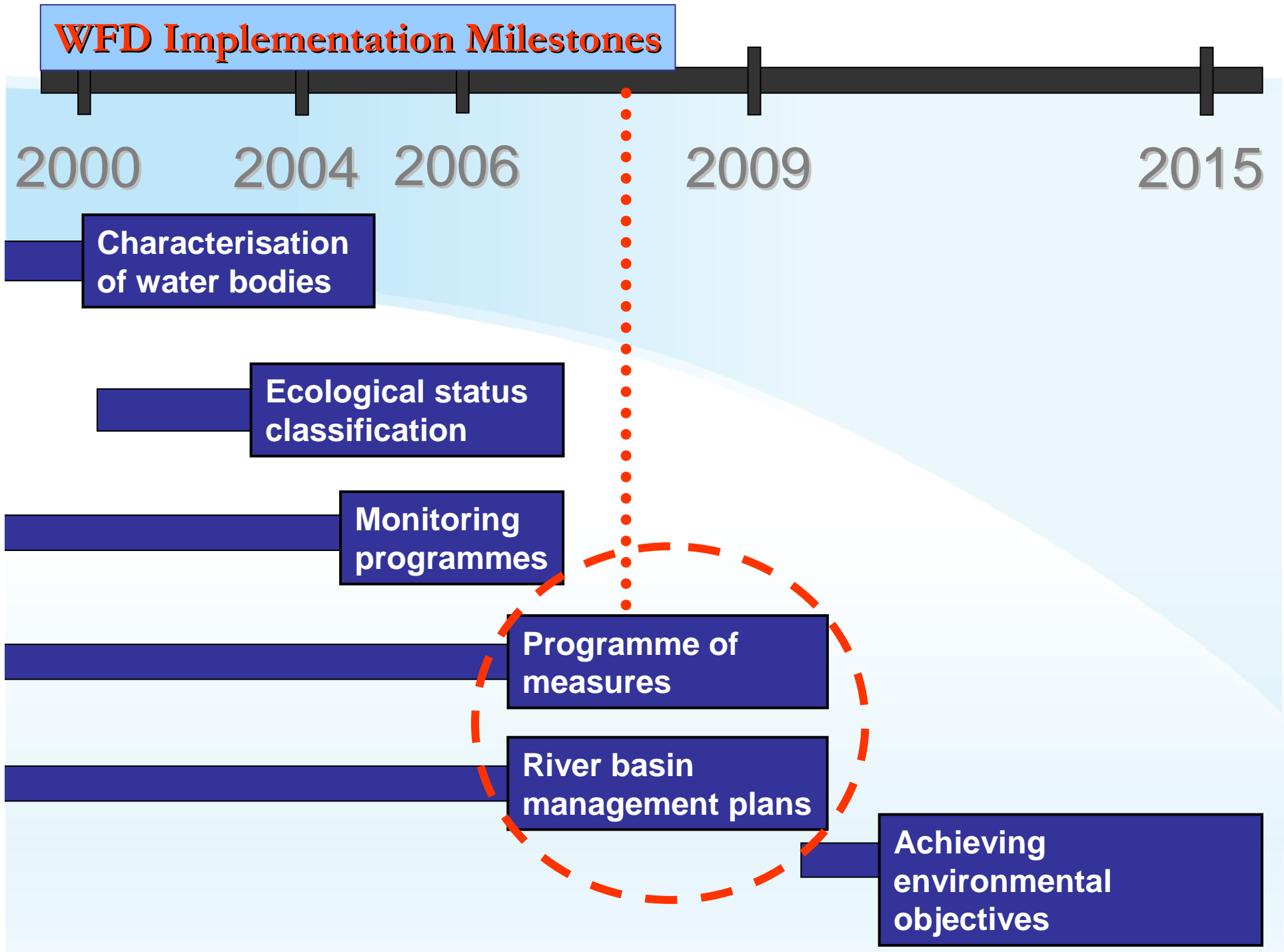
Ecological status
classification

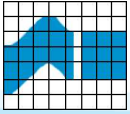
Monitoring
programmes

Programme of
measures

River basin
management plans

Achieving
environmental
objectives





Milestone 4; Programme of measures/RBMP

WFD Article 11, (13) and Annex VI, (VII)

1. Basic measures

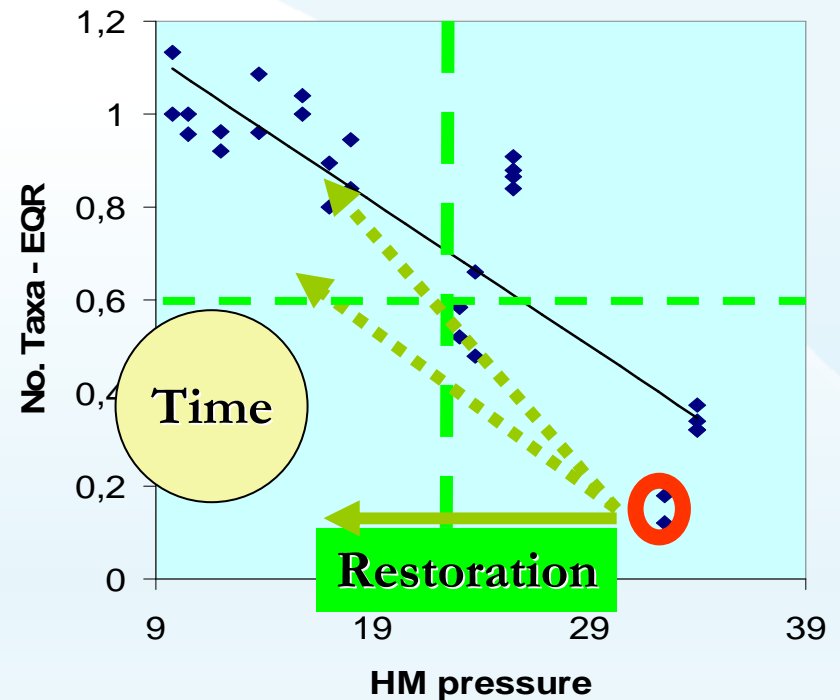
2. Supplementary measures



1. High
2. Good
3. Moderate
4. Poor
5. Bad

Biodiversity protection

Efficiency



WFD Implementation Milestones

2000

2004

2006

2009

2015

Characterisation
of water bodies

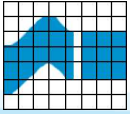
Ecological status
classification

Monitoring
programmes

Programme of
measures

River basin
management plans

Achieving
environmental
objectives

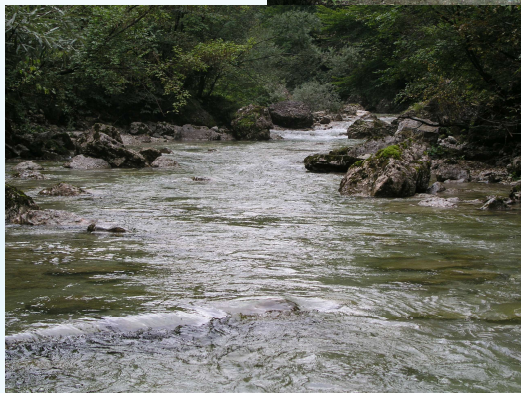


Milestone 5; Achieving environmental objectives

WFD Article 4

1. Good ecological status

2. Good chemical status



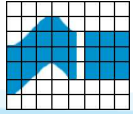
1. High
2. Good
3. Moderate
4. Poor
5. Bad

Biodiversity is protected

Reality?

Heavily modified water bodies
Artificial water bodies

Protection of secondary
habitats



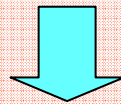
Summary

WFD



Development

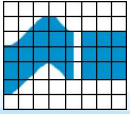
Freshwater Biodiversity (FB)



Good perspective...but...

...many gaps!

Climate change



Thank you!