



The Water Framework Directive 2000/60/EC and the conservation of the otter in Europe



Anna Loy – Dept STAT – Università del Molise – Italy

**Susanna D'Antoni, Michela Gori – ISPRA - Institute for
Environmental Protection & Research - Italy**



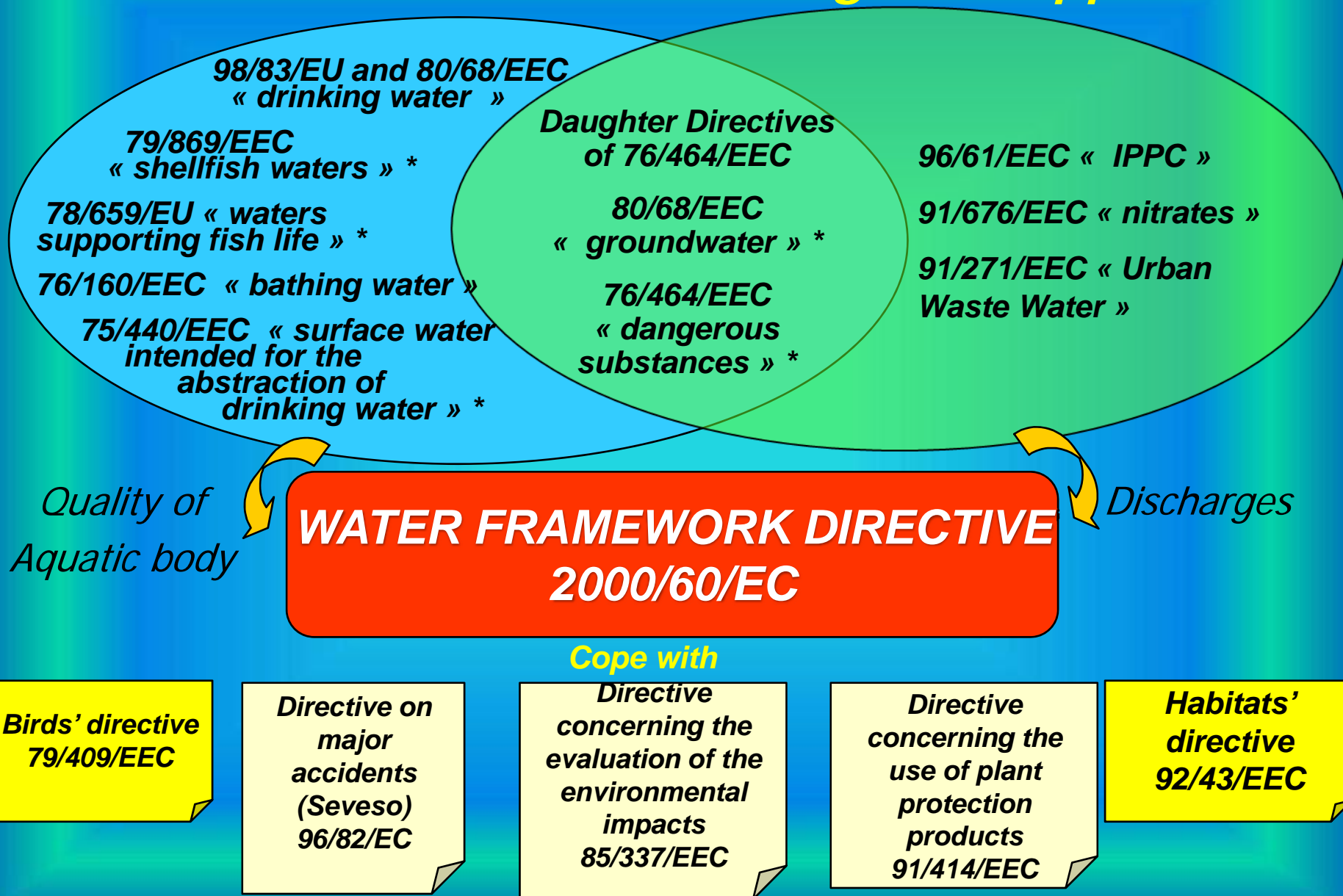
Objectives

- What is the Water Framework Directive?
- Can the otter benefit from the WFD?
- How is the WFD related to other EU Directives devoted to the protection of endangered species?



Panorama of European Directives

From a sectorial to an integrated approach



* Directives to be repealed by the Water Framework Directive



Aims

- Improve the protection of Community waters in terms of **quantity** and **quality***
- Promote **sustainable water use**
- Contribute to the control of **transboundary** water problems
- **Protect aquatic ecosystems, and terrestrial ecosystems and wetlands directly depending on them**
- Safeguard and develop the potential uses of Community waters

* Purpose is primarily concerned with the **quality** of the waters.
Control of quantity is an ancillary element.



KEY ELEMENTS

- Protecting all waters (**SURFACE WATERS** and **GROUNDWATERS**)
- Covering all impacts on waters
- Good quality ('**good status**') to be achieved, as a rule, by **2015**
- Water quality defined in terms of **biology**, **chemistry** and **morphology**
- Management by HYDROGRAPHIC DISTRICTS (**RBD – RIVER BASIN DISTRICTS**), irrespective of political borders

RIVER BASIN DISTRICTS (RBD)

National RBD Small river basins combined with larger river basins or joined with neighbouring small basins

International RBD (inside EU27) extend beyond the territory of Member States (e.g. Danube)

International RBD (outside EU27) extends beyond the territory of the Community



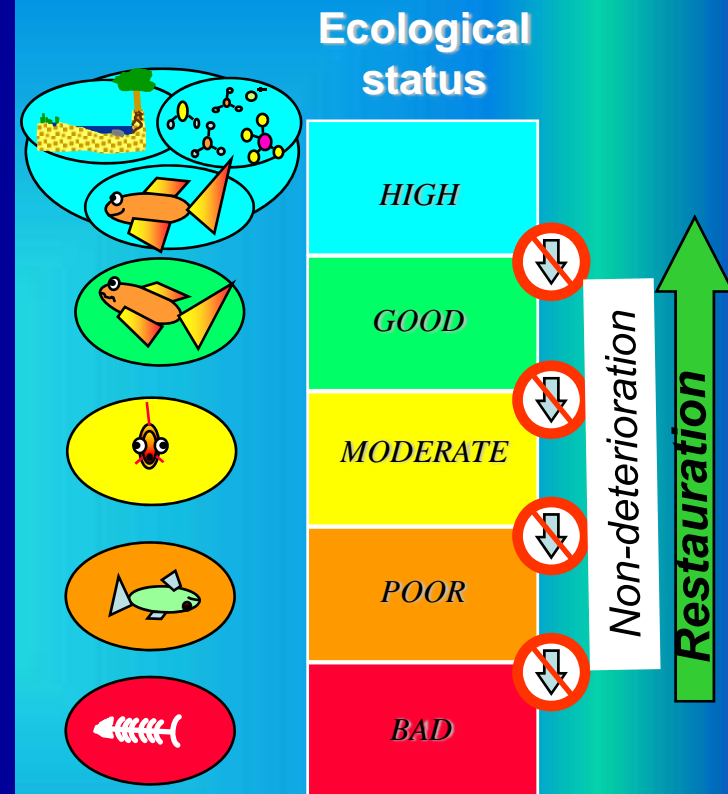
27 Member States

NORWAY, BULGARIA and ROMANIA are participating on a voluntary basis



Environmental objectives

- Reach the **good status** of surface waters (**ecological and chemical**) and groundwaters (**chemical and quantitative**)
- No deterioration**
- Protect, enhance and restore all artificial and heavily modified bodies of water to achieve a **good ecological potential** and a good chemical status
- Specific objectives to reach in **PROTECTED AREAS**
- Suppress the discharges of priority **dangerous substances** in 20 years and reduce emissions of priority substances



Courtesy Peter Pollard



WHAT IS 'GOOD'?

GOOD surface water status means the status achieved by a surface water body when both its **ecological status** and its **chemical status** are at least good



ECOLOGICAL STATUS

**Biological quality
elements**

**Hydromorphological
quality elements**

**Physico-chemical
quality elements**

CHEMICAL STATUS

**Chemical quality
standards**



Environmental objectives

SURFACE WATERS



- PREVENT DETERIORATION of the status
- PROTECT, ENHANCE AND RESTORE all bodies with the aim of achieving good status within 2015
- Protect and enhance ARTIFICIAL AND HEAVILY MODIFIED bodies of water
- Implement measures for reducing POLLUTION from priority substances and ceasing emissions, discharges and losses of priority hazardous substances

PROTECTED AREAS



achieve COMPLIANCE WITH ANY STANDARDS AND OBJECTIVES within 2015

GROUNDWATERS



- Protect, enhance and restore
- Ensure abstraction/recharge balance
- Control and prevent pollutants concentration



REGISTER OF PROTECTED AREAS

Register of all areas lying within each river basin district which have been designated as requiring special protection under specific Community legislation for the protection of their surface water and groundwater **or for the conservation of habitats and species directly depending on water**





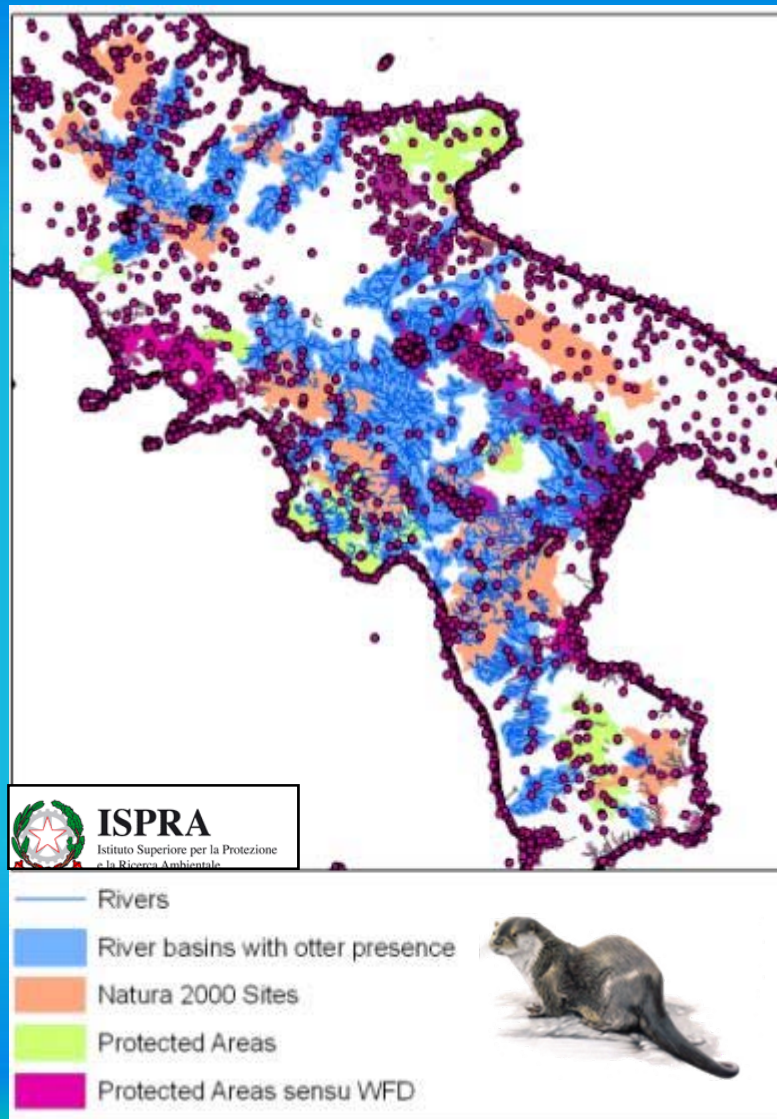
REGISTER OF PROTECTED AREAS includes areas designated for

- ❑ ABSTRACTION of water intended for human consumption
- ❑ PROTECTION OF ECONOMICALLY SIGNIFICANT AQUATIC SPECIES (SHELLFISH AND FISH)
- ❑ RECREATIONAL WATERS
- ❑ FOR THE PROTECTION OF HABITATS OR SPECIES WHERE THE MAINTENANCE OR IMPROVEMENT OF THE STATUS OF WATER IS AN IMPORTANT FACTOR IN THEIR PROTECTION, INCLUDING RELEVANT NATURA 2000 SITES designated under Directive 92/43/EEC (1) and Directive 79/409/EEC (2)
- ❑ NUTRIENT-SENSITIVE AREAS





REGISTER OF PROTECTED AREAS





UK Technical advisory group on WFD advises for identification of relevant Nature 2000 sites for inclusion on the Register of Protected Areas

CRITERIA TO IDENTIFYING NATURA 2000 SPECIES DIRECTLY DEPENDENT ON WATER

Natura 2000 SPECIES

1.a Aquatic species **living in surface waters** as defined in art. 2 of WFD

1.b Species with **at least one aquatic life stage dependent on surface water** (i.e. species that use surface water for breeding; incubation, juvenile development; sexual maturation, feeding, or roosting)

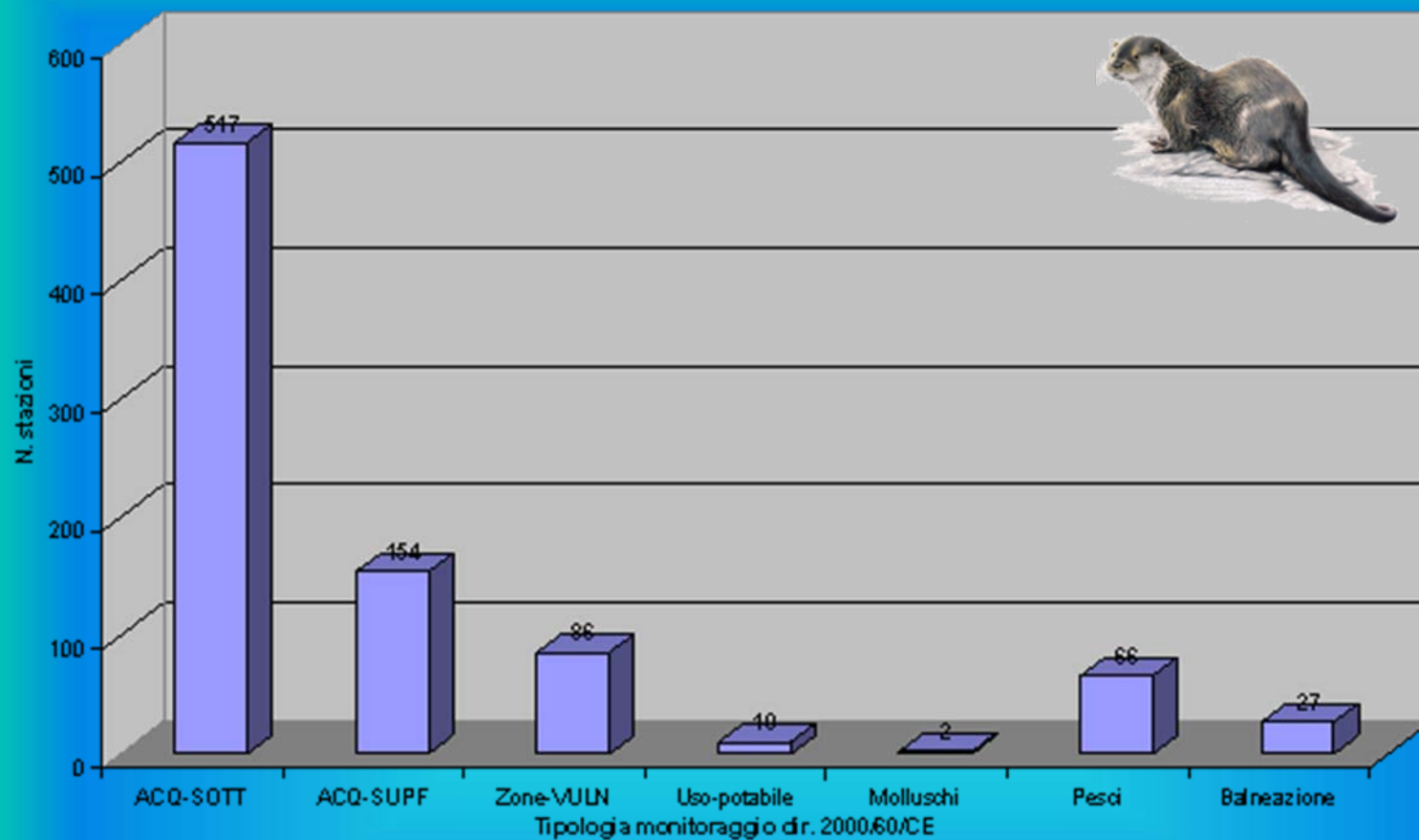
1.c Species that **rely on the non-aquatic but water dependent habitats** (also defined)



33 water dependent SAC species identified, including OTTER

water dependent SAC habitats

Natura 2000 sites on RPA

**Monitoraggio corpi idrici con segnalazioni di lontre**

Monitoring sites with otters included in the register of protected areas in Italy (art. 6 dir. 2000/60/CE)



River Basin Management Plan

- **Characteristics of the RBD**
- **Pressures and impacts**
- **Protected areas** (map)
- **Monitoring network** (map)
- **Results of monitoring** (maps)
- **Environmental objectives**
- **Programmes and summary of measures** to achieve the objectives
- **Economic analysis** of water use register of more detailed programmes
- **Public information and consultation** measures
- **Competent authorities**

Categories
Location
Ecoregions
Reference condition

Point source pollution
Diffuse source pollution
Abstraction (quantitative status)
Others

Surface waters
Groundwaters
Protected areas



WATER CATEGORIES

SURFACE WATERS

RIVERS

LAKES

TRANSITIONAL WATERS

COASTAL WATERS

ARTIFICIAL WATERS

HEAVILY MODIFIED WATERS

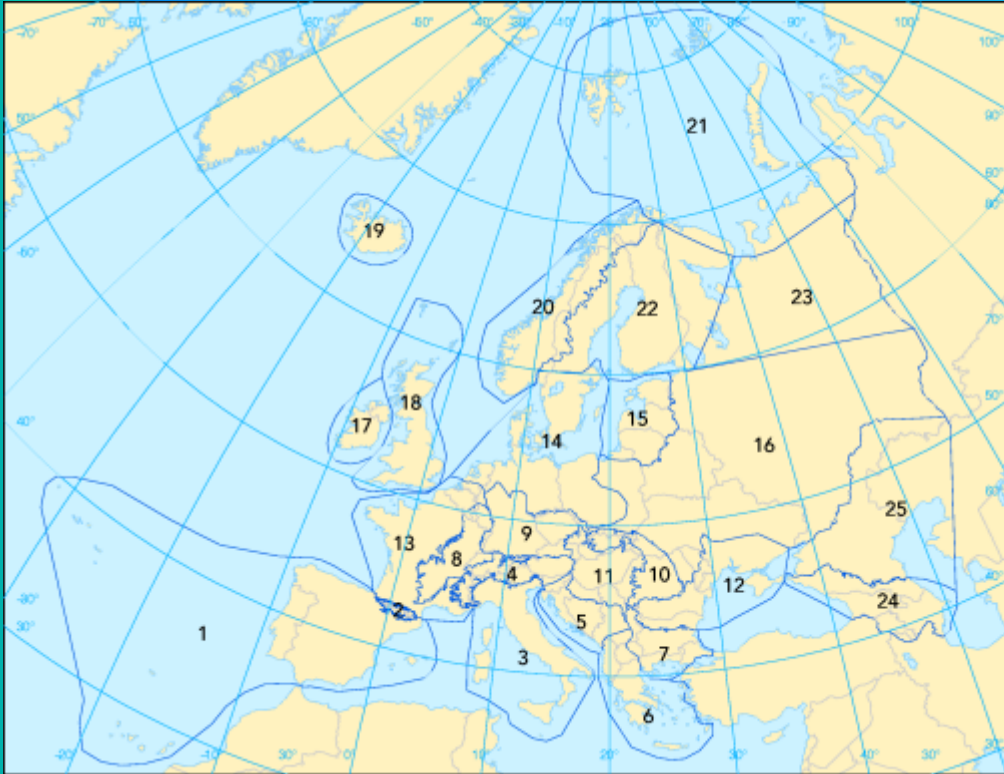
GROUNDWATERS



ECOREGIONS

Rivers and lakes

Transitional and coastal waters



Ecoregions for rivers and lakes

1. Ibero-Macaronesian region
2. Pyrenees
3. Italy, Corsica and Malta
4. Alps
5. Dinaric western Balkan
6. Hellenic western Balkan
7. Eastern Balkan
8. Western highlands
9. Central highlands
10. The Carpathians
11. Hungarian lowlands
12. Pontic province
13. Western plains
14. Central plains
15. Baltic province
16. Eastern plains
17. Ireland and Northern Ireland
18. Great Britain
19. Iceland
20. Boreal uplands
21. Tundra
22. Fenno-scandian shield
23. Taiga
24. The Caucasus
25. Caspian depression



1. Atlantic Ocean
2. Norwegian Sea
3. Barents Sea
4. North Sea
5. Baltic Sea
6. Mediterranean Sea

different from Habitat directive!



WATER STATUS MONITORED ON A SYSTEMATIC AND COMPARABLE BASIS

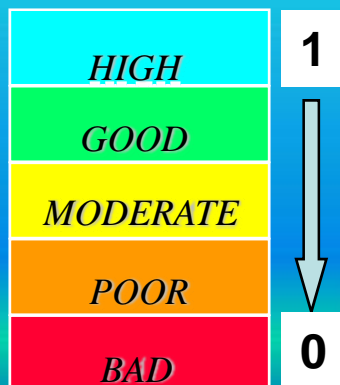
Establishment of **TYPE-SPECIFIC REFERENCE
CONDITIONS** for surface water body types

Hydromorphological and
Physicochemical

Biological

INTERCALIBRATION NETWORK

At least 2 sites
for each water
category





REFERENCE NETWORK

For heavily modified or artificial surface water bodies references to high ecological status shall be construed as **references to maximum ecological potential**

Such systems **may utilise particular species or groups of species which are representative of the quality element as a whole**



Italian Environmental Agency has proposed to include Habitat Directive species (annex II and IV) and habitats (annex I) as criteria for evaluation





Identification of Pressures

POINT AND DIFFUSE SOURCE POLLUTION

from urban, industrial,
agricultural and other
installations and activities

in particular by substances listed in
Annex VIII,

WATER ABSTRACTION

for urban, industrial,
agricultural and other uses,
including seasonal variations
and total annual demand,
and of loss of water in
distribution systems

WATER FLOW REGULATION

including water transfer and
diversion, on overall flow characteristics and
water balances.

LAND USE PATTERNS

including identification of the main urban,
industrial and agricultural areas and, where
relevant, fisheries and forests.

MORPHOLOGICAL ALTERATIONS TO WATER BODIES

OTHER SIGNIFICANT ANTHROPOGENIC IMPACTS ON THE STATUS OF SURFACE WATERS

Assessment of Impact

Member States shall carry out an assessment of the susceptibility of the surface water
status of bodies to the pressures identified above



Art. 8 - MONITORING

SURFACE WATERS

- assess **volume and level or rate of flow** to the extent relevant for ecological and chemical status and ecological potential
- assess the **ecological and chemical status** and the **ecological potential** (artificial and heavily modified water bodies)

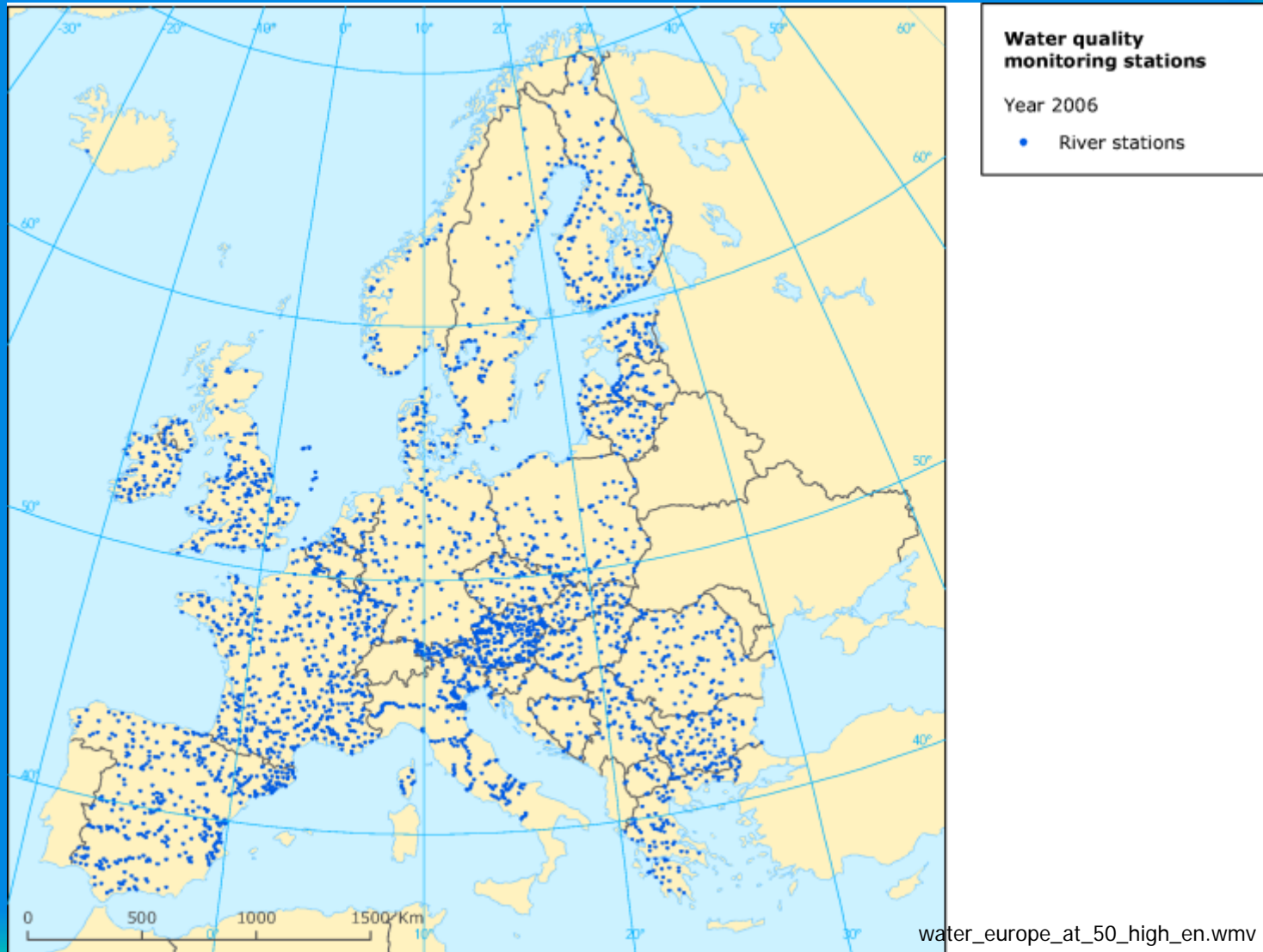
protected areas



programmes supplemented by those specifications contained in Community legislation under which the individual protected areas have been established.



Annex V





MONITORING

mandatory

SURVEILLANCE monitoring

**mandatory for
water body at
risk of failing
2015 objective**

OPERATIONAL monitoring

**if needed to
ascertain
the causes of a
water body or
water bodies
failing to achieve
the
environmental
objectives**


INVESTIGATIVE monitoring

**1 yr for each
RB MP (6
years). Once
every three
RB MP if
status is
'good'**



ECOLOGICAL STATUS IN RIVERS

Biological quality elements

STATUS	PHYTOPLANKTON	MACROPHYTES AND PHYTOBENTHOS	BENTHIC INVERTEBRATE FAUNA	FISH FAUNA 
HIGH	Taxonomic composition of phytoplankton corresponds totally or nearly totally to undisturbed conditions.	The taxonomic composition corresponds totally or nearly totally to undisturbed conditions.	The taxonomic composition and abundance correspond totally or nearly totally to undisturbed conditions.	Species composition and abundance correspond totally or nearly totally to undisturbed conditions. All the type-specific disturbance-sensitive species are present The age structures of the fish communities show little sign of anthropogenic disturbance and are not indicative of a failure in the reproduction or development of any particular species.
GOOD	slight changes in the composition and abundance of planktonic taxa compared to the type-specific communities.	Slight changes in the composition and abundance of macrophytic and phytobenthic taxa do not indicate any accelerated growth of phytobenthos or higher forms of plant life Phytobenthic community is not adversely affected by bacterial tufts and coats.....	Slight changes in the composition and abundance of invertebrate taxa ... The ratio of disturbance-sensitive taxa to insensitive taxa shows slight alteration ... Diversity of invertebrate taxa shows slight signs of alteration	Slight changes in species composition and abundance .. attributable to anthropogenic impacts on physicochemical and hydromorphological quality elements. Age structures of the fish communities <u>show signs of disturbance attributable to anthropogenic impacts</u>, and, in a few instances, are indicative of a failure in the reproduction or development of a particular species
MODERATE	The composition of planktonic taxa differs moderately from the type-specific communities	The composition of macrophytic and phytobenthic taxa differs moderately .. Moderate changes in the average macrophytic and the average phytobenthic abundance... Phytobenthic community may be interfered	The composition and abundance of invertebrate taxa differ moderately ... Major taxonomic groups of the type-specific community are absent. The ratio of disturbance-sensitive taxa to insensitive taxa, and the level of diversity, are substantially lower	Composition and abundance of fish species differ moderately The age structure of the fish communities shows major signs of anthropogenic disturbance , to the extent that a moderate proportion of the <u>type specific species are absent or of very low abundance</u> .



ECOLOGICAL STATUS IN RIVERS

Hydromorphological quality elements



STATUS	HYDROLOGICAL REGIME	RIVER CONTINUITY	MORPHOLOGICAL CONDITIONS
HIGH	The quantity and dynamics of flow , and the resultant connection to groundwaters, reflect totally, or nearly totally, undisturbed conditions	The continuity of the river is not disturbed by anthropogenic activities and allows undisturbed migration of aquatic organisms and sediment transport	Channel patterns, width and depth variations, flow velocities, substrate conditions and both the structure and condition of the riparian zones correspond totally or nearly totally to undisturbed conditions
GOOD	Conditions <u>consistent with the achievement of the values specified above for the biological quality elements</u> .	Conditions consistent with the achievement of the values specified above for the biological quality elements	Conditions consistent with the achievement of the values specified above for the biological quality elements.
MODERATE	Conditions consistent with the achievement of the values specified above for the biological quality elements.	Conditions consistent with the achievement of the values specified above for the biological quality elements.	Conditions consistent with the achievement of the values specified above for the biological quality elements.



ECOLOGICAL STATUS IN RIVERS



Physico-chemical quality elements

STATUS	GENERAL CONDITIONS	SPECIFIC SYNTHETIC POLLUTANTS	SPECIFIC NON-SYNTHETIC POLLUTANTS
HIGH	<p>The values of the physico-chemical elements correspond totally or nearly totally to undisturbed conditions.</p> <p>Nutrient concentrations remain within the range normally associated with undisturbed conditions.</p> <p>Levels of salinity, pH, oxygen balance, acid neutralising capacity and temperature do not show signs of anthropogenic disturbance and remain within the range normally associated with undisturbed conditions</p>	<p>Concentrations close to zero and at least below the limits of detection of the most advanced analytical techniques in general use.</p>	<p>Concentrations remain within the range normally associated with undisturbed conditions (background levels = bgl).</p>
GOOD	<p>Temperature, oxygen balance, pH, acid neutralising capacity and salinity do not reach levels outside the range established so as to ensure the functioning of the type specific ecosystem and the achievement of the values specified above for the biological quality elements.</p> <p>Nutrient concentrations do not exceed the levels established so as to ensure the functioning of the ecosystem and the achievement of the values specified above for the biological quality elements.</p>	<p>Concentrations not in excess of the standards set in accordance with the procedure detailed in section 1.2.6 without prejudice to Directive 91/414/EC and Directive 98/8/EC. (<EQS)</p>	<p>Concentrations not in excess of the standards set in accordance with the procedure detailed in section 1.2.6 (2) without prejudice to Directive 91/414/EC and Directive 98/8/EC. (<EQS)</p>
MODERATE	<p>Conditions consistent with the achievement of the values specified above for the biological quality elements</p>	<p>Conditions consistent with the achievement of the values specified above for the biological quality elements</p>	<p>Conditions consistent with the achievement of the values specified above for the biological quality elements</p>



Conclusions

Art. 3 - Management by hydrographic districts (RBD)



Monitoring, restoring, and preserving otter habitat (water, dens, food) within a whole river basin system

Art. 2 - Control of discharge for priority and hazardous substances



Control of hazardous pollutants

Art. 5 - CHARACTERIZATION OF RIVERS, LAKES, TRANSITIONAL WATERS → reference and monitoring network

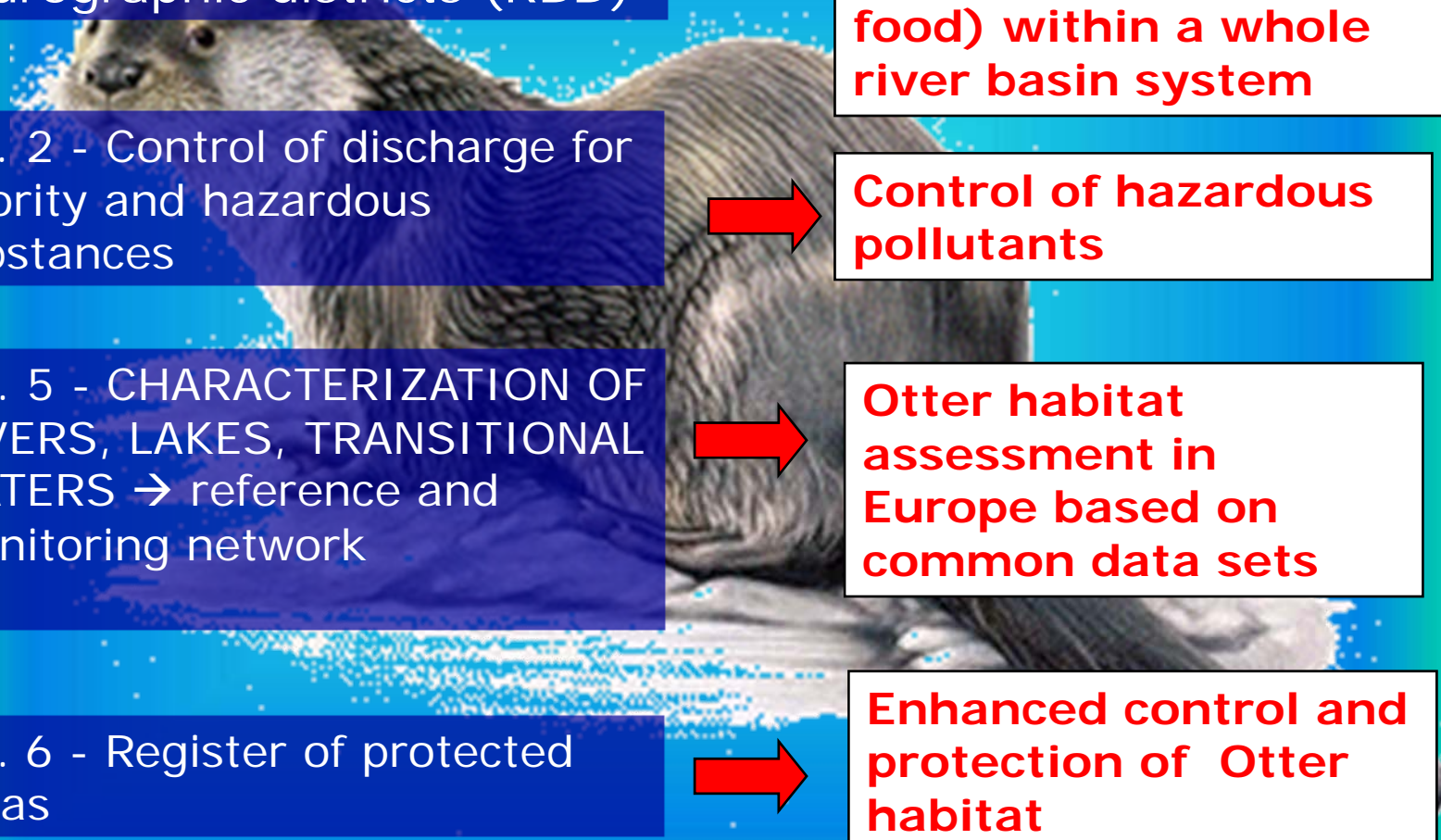


Otter habitat assessment in Europe based on common data sets

Art. 6 - Register of protected areas

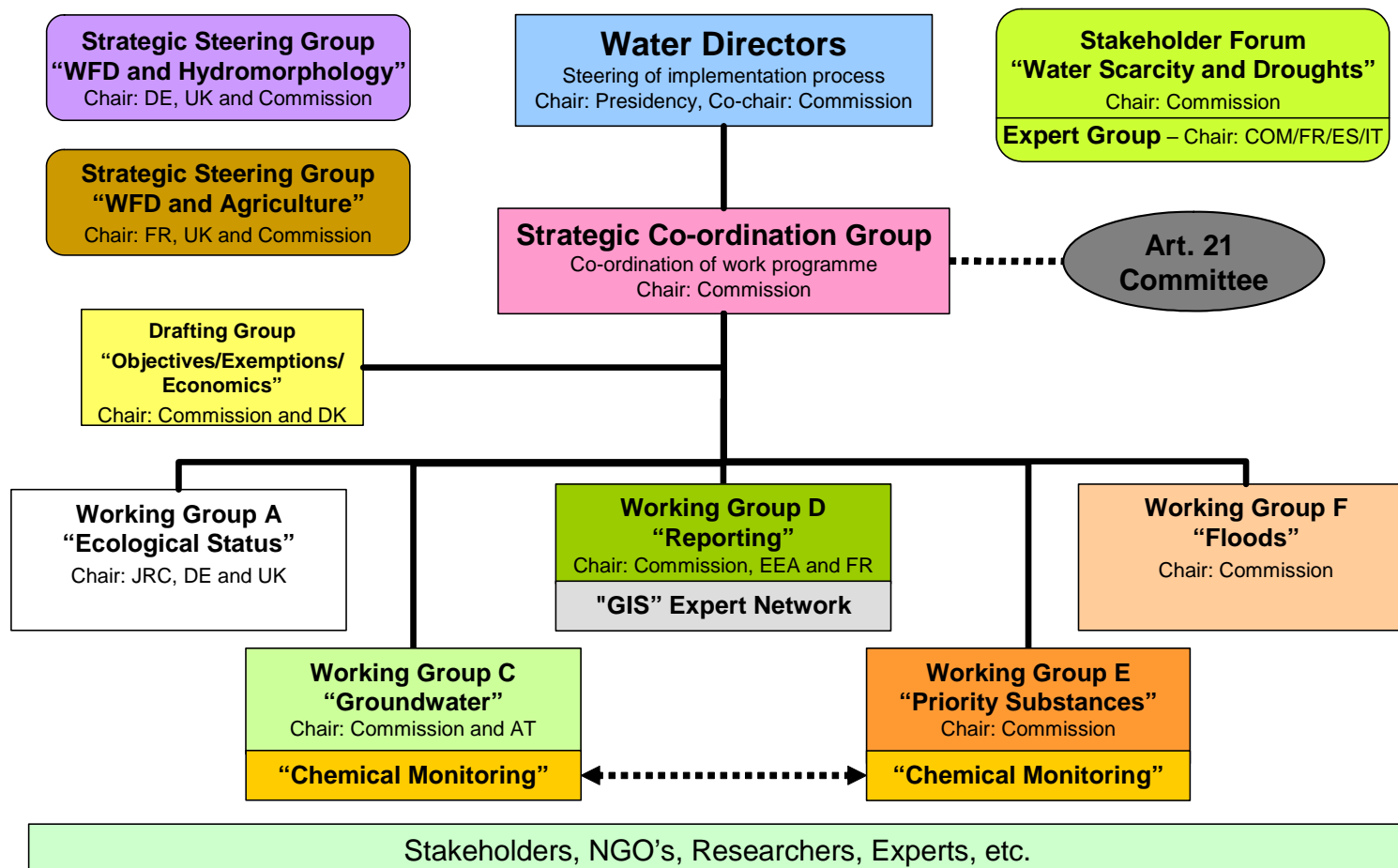


Enhanced control and protection of Otter habitat





Organisation of Common Implementation Strategy 2007-2009





More information

On water policy:

[http://www.europa.eu.int/comm/
environment/water](http://www.europa.eu.int/comm/environment/water)

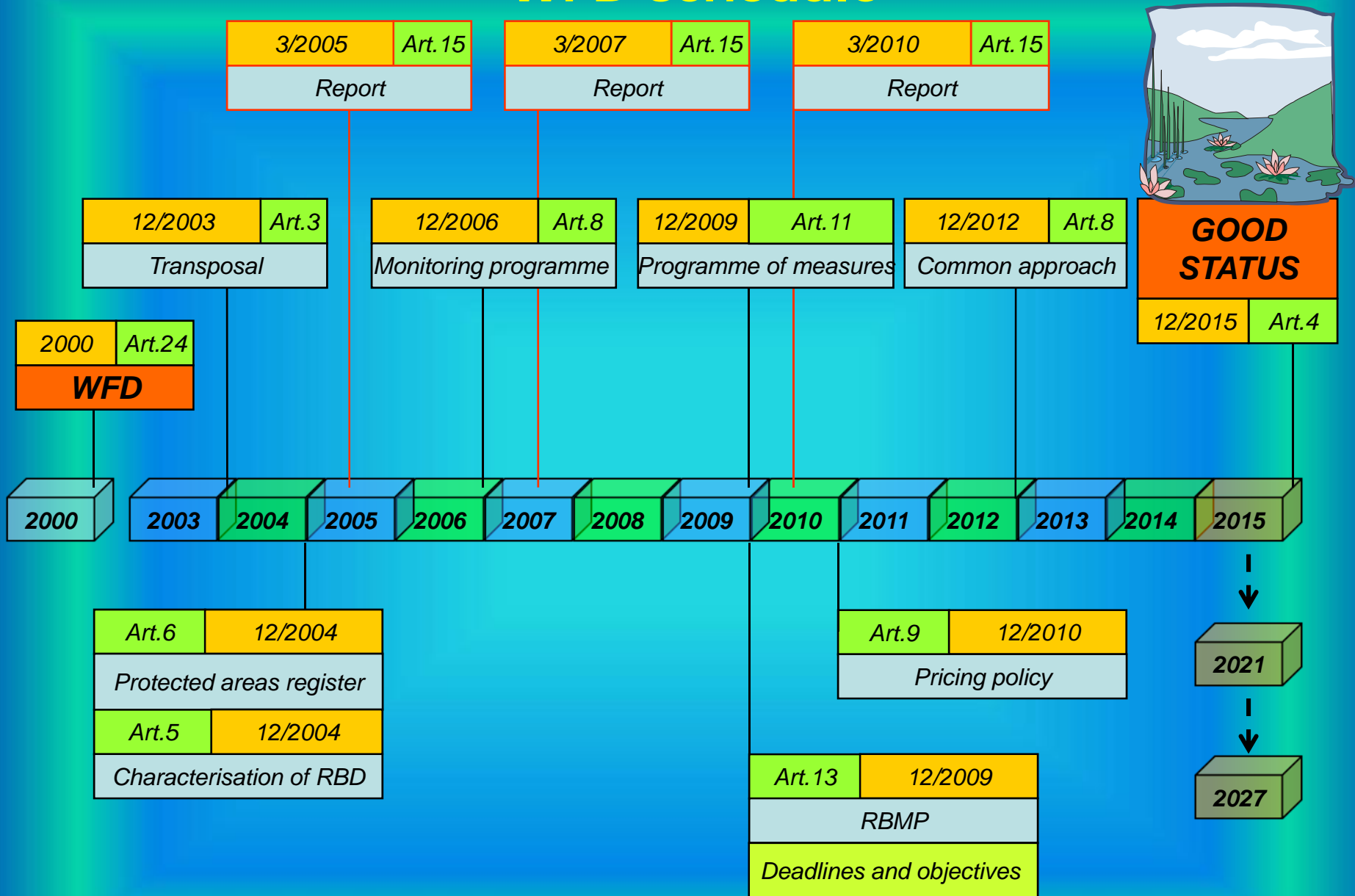
WFD CIRCA Information Exchange Platform

[http://forum.europa.eu.int/Public/irc/env/wfd/
library](http://forum.europa.eu.int/Public/irc/env/wfd/library)

Email:

env-wfd-circa@cec.eu.int

WFD schedule



SURVEILLANCE MONITORING
Frequency

Quality element	Rivers	Lakes	Transitional	Coastal
Biological				
Phytoplankton	6 months	6 months	6 months	6 months
Other aquatic flora	3 years	3 years	3 years	3 years
Macro invertebrates	3 years	3 years	3 years	3 years
Fish	3 years	3 years	3 years	3 years
Hydromorphological				
Continuity	6 years			
Hydrology	Continuous	1 month		
Morphology	6 years	6 years	6 years	6 years
Physico-chemical				
Thermal conditions	3 months	3 months	3 months	3 months
Oxygenation	3 months	3 months	3 months	3 months
Salinity	3 months	3 months	3 months	
Nutrient status	3 months	3 months	3 months	3 months
Acidification status	3 months	3 months		
Other pollutants	3 months	3 months	3 months	3 months
Priority substances	1 month	1 month	1 month	1 month

"WFD Scoreboard" - Nov 2006

Country	Trsp	RBD Rep.	Art5 rep.
Austria			
Belgium			
Cyprus			
Czech Republic			
Denmark			
Estonia			
Finland			
France			
Germany			





Country	Trsp	RBD Rep.	Art5 rep.
Greece			
Hungary			
Ireland			
Italy			
Latvia			
Lithuania			
Luxembourg			
Malta			
Netherlands			

Country	Trsp	RBD Rep.	Art5 rep.
Poland			
Portugal			
Slovakia			
Slovenia			
Spain			
Sweden			
United Kingdom			

Trsp *Transposal*
RBD *river basin district report*

Scoreboard and all MS reports publicly available through

<http://europa.eu.int/comm/environment/water/water-framework/>

Explanation of symbols and colours	
Report or information submitted electronically via the WFD report prototype	
Report or information submitted	
Requirements only partially fulfilled	
Report or information not submitted	

MONITORING NETWORK

	Objective	Selection of monitoring points	Selection of quality elements	period
SURVEILLANCE	<p>provide information for:</p> <ul style="list-style-type: none"> • supplementing and validating the impact assessment procedure detailed in Annex II, • design of future monitoring programmes, • assessment of long-term changes in natural conditions, and • assessment of long-term changes resulting from widespread anthropogenic activity 	<p>Sufficient surface water bodies to provide an assessment of the overall surface water status within each catchment or subcatchments within the river basin district.</p>	<p>parameters indicative of all biological quality elements, hydromorphological quality elements, general physico-chemical quality elements,</p> <ul style="list-style-type: none"> . priority list pollutants which are discharged into the river basin or sub-basin, and . other pollutants discharged in significant quantities in the river basin or sub-basin, 	<p>one year during the period covered by a river basin management plan (6years),</p> <p>once every three river basin management plans if status is 'good'</p>
OPERATIONAL	<ul style="list-style-type: none"> • Establish the status of those bodies identified as being <u>at risk of failing</u> to meet their environmental objectives • Assess any changes in the status of such bodies resulting from the programmes of measures 	<p>Monitoring points shall be selected for priority list substances as specified in the legislation laying down the relevant environmental quality standard</p>	<p>In order to assess the magnitude of the pressure</p> <ul style="list-style-type: none"> . parameters indicative of the biological quality element, or elements, most sensitive to the pressures to which the water bodies are subject, . all priority substances discharged, and other pollutants discharged in significant quantities, . parameters indicative of the hydromorphological quality element most sensitive to the pressure identified 	<p>The programme may be amended during the period of the river basin management plan in the light of information obtained</p>
INVESTIGATIVE	<p>where the reason for any exceedances is unknown,</p> <ul style="list-style-type: none"> . where surveillance monitoring indicates that the objectives set out in Article 4 for a body of water are not likely to be achieved and operational monitoring has not already been established, in order to ascertain <p>the causes of a water body or water bodies failing to achieve the environmental objectives, or</p> <ul style="list-style-type: none"> . to ascertain the magnitude and impacts of accidental pollution, 		<p>shall inform the establishment of a programme of measures for the achievement of the environmental objectives and specific measures necessary to remedy the effects of accidental pollution</p>	

Programmes operational within 2006

S U R F A C E W A T E R S

1.2 Normative definitions of ecological status classifications

HIGH	GOOD	MODERATE
<p>no, or only very minor, anthropogenic alterations to the values of the physico-chemical and hydromorphological quality elements for the surface water body type from those normally associated with that type under undisturbed conditions. The values of the biological quality elements for the surface water body reflect those normally associated with that type under undisturbed conditions, and show no, or only very minor, evidence of distortion. These are the type-specific conditions and communities.</p>	<p>The values of the biological quality elements for the surface water body type show low levels of distortion resulting from human activity, but deviate only slightly from those normally associated with the surface water body type under undisturbed conditions</p>	<p>The values of the biological quality elements for the surface water body type deviate moderately from those normally associated with the surface water body type Under undisturbed conditions. The values show moderate signs of distortion resulting from human activity and are significantly more disturbed than under conditions of good status.</p>

POOR evidence of **major alterations** ... and the **relevant biological communities deviate substantially** from those normally associated with the surface water body type under undisturbed conditions,

BAD **severe alterations** to the values of the biological quality elements for the surface water body type and in which **large portions of the relevant biological communities normally associated with the surface water body type under undisturbed conditions are absent**

Art. 11 - PROGRAMME OF MEASURES

BASIC MEASURES: to

- a. **implement Community legislation** for the protection of water
- b. for the recovery of costs
- c. promote an **efficient and sustainable water use**
- d. **safeguard water quality** in order to reduce the level of purification treatment required for the production of drinking water;
- e. **controls over the abstraction** of fresh surface water and groundwater, and impoundment of fresh surface water, including a register or **registers of water abstractions** and a requirement of **prior authorisation for abstraction** and impoundment.
- f. **Controls of artificial recharge** or augmentation of groundwater bodies
- g. for **point source discharges** liable to cause pollution, a requirement for **prior regulation**, such as a prohibition on the entry of pollutants into water, **or for prior authorisation, or registration** based on general binding rules, laying down emission controls for the pollutants concerned, including controls in accordance with Articles 10 and 16.
- h. for **diffuse sources liable to cause pollution**, measures to **prevent or control the input of pollutants**.
- i. ensure that the **hydromorphological conditions** of the bodies of water are consistent with the achievement of the required ecological status or good ecological potential for bodies of water designated as artificial or heavily modified.
- j. a **prohibition of direct discharges of pollutants into groundwater**
- k. **eliminate pollution of surface waters by priority substances and to progressively reduce pollution by other substances**
- l. **prevent significant losses of pollutants from technical installations, and to prevent and/or to reduce the impact of accidental pollution incidents**

Within 2009

Reviewed and updated within 2015, and every 6 yrs thereafter

Art. 11 - PROGRAMME OF MEASURES

Within 2012

SUPPLEMENTARY MEASURES:
measures designed and implemented in addition to the basic measures with the aim of achieving the objectives established pursuant to Article 4.

SUPPLEMENTARY MEASURES:

- a. those measures required to implement Community legislation for the protection of water, including measures required under the legislation specified in Article 10 and in part A of Annex VI;
- b. measures deemed appropriate for the purposes of Article 9
- c. measures to promote an efficient and sustainable water use
- d. measures to meet the requirements of Article 7, including measures to safeguard water quality in order to reduce the level of purification treatment required for the production of drinking water;
- e. controls over the abstraction of fresh surface water and groundwater, and impoundment of fresh surface water, including a register or registers of water abstractions and a requirement of prior authorisation for abstraction and impoundment. These controls shall be periodically reviewed and, where necessary, updated. Member States can exempt from these controls, abstractions or impoundments which have no significant impact on water status;
- f. controls, including a requirement for prior authorisation of artificial recharge or augmentation of groundwater bodies. The water used may be derived from any surface water or groundwater, provided that the use of the source does not compromise the achievement of the environmental objectives established for the source or the recharged or augmented body of groundwater. These controls shall be periodically reviewed and, where necessary, updated;
- g. for point source discharges liable to cause pollution, a requirement for prior regulation, such as a prohibition on the entry of pollutants into water, or for prior authorisation, or registration based on general binding rules, laying down emission controls for the pollutants

Art. 13 - RIVER BASIN MANAGEMENT PLANS

may be supplemented by the production of more detailed programmes and management plans for sub-basin, sector, issue, or water type, to deal with particular aspects of water management.

S U R F A C E W A T E R S**1.1 Quality elements for the classification of ECOLOGICAL STATUS****RIVERS****BIOLOGICAL ELEMENTS**

- Composition and abundance of **aquatic flora**
- Composition and abundance of **benthic invertebrate fauna**
- **Composition, abundance and age structure of fish fauna**

Hydromorphological elements supporting the biological elements**Hydrological regime**

- Quantity and dynamics of water flow
- Connection to groundwater bodies
- River continuity

Morphological conditions

- river depth and width variation
- structure and substrate of the river bed
- structure of the riparian zone

Chemical and physico-chemical elements supporting the biological elements**General**

- Thermal conditions
- Oxygenation conditions
- Salinity
- Acidification status
- Nutrient conditions

Specific pollutants

- Pollution by all priority substances identified as being discharged into the body of water
- Pollution by other substances identified as being discharged in significant quantities into the body of water

Similar for lakes, transitional and coastal waters

Directive	Objectives	Subject
WFD 2000/60/CE	Protection of surface, inland, transitional, coastal, and groundwater	Water resources and related ecosystems
Habitat 92/43/CE	conservation of habitats and species	Species and habitats of community interests; CIS (sp. All II, habitat all.I)
Bird 79/409/CEE	Conservation of bird species	All bird species living in Europe; SPZ (sp. All. I and regular migrants)

The stakes of WFD : overall context

