The Water Framework Directive and Nature Conservation

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CONTENT

1 Background

Land and water use and management in catchment areas affect rivers, lakes and wetlands, their biology, water flow and water quality. Speaking in ecological terms, natural freshwater bodies and neighbouring ecosystems such as floodplains create integrated living systems hosting diverse and complex biodiversity. Rivers and lakes in good ecological condition support a wide range of habitats and biodiversity, i.e. about a quarter of all European bird species and about 10 per cent of all European mammals live in or on rivers and their floodplains.[1] Rivers and their floodplain wetlands are, however, among the most vulnerable and threatened ecosystems in Europe due to the way they have been used and managed over the past centuries. Generations of people have altered rivers and used their biological richness and fertile floodplains as their economic living basis. The threats resulting from human influence today are manifold, comprising hydropower schemes, water transfer, reservoir construction, waste disposal, intensification of agriculture, deforestation, urbanisation, dredging, river straightening and engineering operations for flood defence.

Against this background, the ecological situation of Europe's freshwaters can be briefly described as follows: Most of Europe's rivers have been regulated and fragmented. Pollution from agriculture, industry and human settlements are still increasing, leading to drinking water problems and severe changes of ecosystems and biodiversity.[2] Further damage of freshwater resources and ecosystems is caused by unsustainable uses and farming practices such as depleting aquifers and draining rivers for irrigation. Floodplains i.e. have disappeared at an unprecedented scale, going hand in hand with a reduced water retention capacity and an increasing occurrence of disastrous flooding.

At the European level, the Water Framework Directive (WFD)[3] has been established to act as an umbrella legislation for sustainable and ecologically sound water management treating river basins as a whole and thus having the potential for integrated land and water management.[4]

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1 WWF 2000: Wise Use of Floodplains. Life Environment Project. Policy and Economic Analysis of Floodplain Restoration in Europe – Opportunities and Obstacles. WWF European Freshwater Programme. November 2000.

2 Kraemer et al. 2001: Protecting Water Resources: Pollution Prevention. Issue Paper for International Conference on Freshwater – Bonn, December 2001. Draft. Berlin: Ecologic.

3 WFD: Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000. Framework for Community action in the field of water policy. Official Journal of the European Communities. 22.12.2000.

4 This report is based on an analysis of the WFD identifying the interface between water management and nature conservation. The WFD has been screened for provisions which directly refer to the protection of ecosystems and species. Provisions concerning the pollution of water, thus having an impact on nature conservation and biodiversity, have not been considered as of yet.

2 The Role of Nature Conservation in the WFD

There are several direct links and overlapping areas between the WFD and nature conservation. The Flora Fauna and Habitats Directive (92/43/EEC) and the Directive on the Conservation of Wild Birds (79/409/EEC) are explicitly mentioned in the WFD in the context of establishing a river basin management plan.[5] Moreover the impacts and pressures on the areas protected under these Directives have to be analysed and specific monitoring requirements of the protected areas are defined. Another important element of the WFD is its focus on ecological balance. For all categories of waters of the WFD a good status is defined which has to be achieved within 15 years. The good status of water includes the objective of a good ecological status, to be defined with the help of instruments of nature conservation. These aspects will be further discussed in the following.

2.1 Coastal and Transitional Water Ecosystems

The propose of the WFD is to establish a framework for the protection of inland surface water, transitional water, coastal water and groundwater. Competing land uses of coastal and inland areas, comprising industry, tourism, agriculture, fishery, urbanisation and settlement lead to pollution of inland waters, estuaries and seas. This is posing a particular threat to coastal ecosystems, their biological diversity and their environmental regulatory functions, not to forget their role in generating employment and food. As far as water quantity is concerned, coastal areas are increasingly being influenced by engineering inland activities that affect water flows, i.e. dams, increased water extraction or straightening of rivers.[6] This again could have an impact on qualitative parameters such as sediment loads. It seems that the links between water management and nature conservation aspects are particularly evident in coastal areas.

The WFD acknowledges that the ecological equilibrium of ecosystems near the coast and estuaries or in gulfs or relatively closed seas is strongly influenced by the quality of inland waters flowing into them.[7]

The Preamble of the WFD highlights that the protection of water status within river basins will provide economic benefits by contributing towards the protection of fish populations, including coastal fish populations.[8] From a nature protection side,

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5 WFD: Annex V No 1(v) and Annex VI, Part A.

6 FAO 1998: Integrated coastal area management and agriculture, forestry and fisheries: FAO guidelines, Environment and Natural Resources Service, FAO, Rome, 1998. 256 p.

7 No. 17 Preamble of the WFD: An effective and coherent water policy must take account of the vulnerability of aquatic ecosystems located near the coast and estuaries or in gulfs or relatively closed seas, as their equilibrium is strongly influenced by the quality of inland waters flowing into them. Protection of water status within river basins will provide economic benefits by contributing towards the protection of fish populations, including coastal fish populations.

8 No. 17 Preamble of the WFD.

it has to be noted that increasing fish populations will also include increasing populations of non-commercially used fish and thus contribute to biodiversity.

As coastal waters are so far not the centre of legislative attraction, either on the European or on the national level, the Water Framework Directive could contribute to create a new (legal) basis for European policy on marine and coastal areas. This could have an initiating effect on national legislation on sea and coastal protection.

2.2 Water Dependent Terrestrial Ecosystems

The WFD covers the prevention of further deterioration and the protection and enhancement of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly dependent on the aquatic ecosystem.[9] This integrated approach implies that wet habitats by the edges of lakes and rivers, including fen, bog, marsh, floodplain or grazing marsh, have to be considered in the context of river basin management according to the WFD.

The protection of (aquatic) ecosystems is pointed out in the Preamble of the Water Framework Directive, thus demonstrating the general relevance of the Directive for nature and biodiversity conservation.

Wetlands are not directly included in the definition of good surface water status, but through the hydromorphological elements, which need to be addressed when the good water status is determined, a link to the qualitative water needs of wetlands is established.

Quantitative needs of wetlands are explicitly included in the context of a good groundwater status. It is required that the level of groundwater is not subject to anthropogenic alterations such as would result in any significant damage to terrestrial ecosystems which depend directly on the groundwater body.[10] It might provide an instrument to encounter the threats to wetlands such as:

- Regulation of rivers and lakes for flood prevention, hydropower and shipping;
- Land drainage for agriculture or
- Overexploitation of ground and surface water.

Thus, the approach of the WFD provides the instruments to include the water needs of wetlands in a river basin oriented water management with an appropriate spatial scale.[11]

2.3 Register of Protected Areas

As one of the first steps towards implementing the WFD, Member States have to establish an inventory of areas lying within each river basin district.[12] This includes

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9 Article 6 para.1, 2 Annex IV WFD.

10 Annex V No. 2.1.2 WFD.

11 F. Barth, 2001, The Importance of Wetlands for Delivering the Environmental Objectives of the Water Framework Directive.

special protection areas which are designated under the Birds and the Habitats Directives in order to establish the European Network Natura 2000 and which are directly dependent on groundwater or surface water. This also includes sites other than those belonging to Natura 2000 that are designated for the protection of habitats or species where the maintenance of the status of water is an important factor in their protection. In Germany these would include for example biotopes or biosphere reserves etc.

Background: Wild Birds Directive

The Wild Birds Directive requires Member States to designate Special Protection Areas (SPAs) in order to conserve the habitats of particularly vulnerable wild bird species[13] as well as vital posts along the migration routes of regularly occurring migratory species.[14] It is made explicit that the Wild Birds Directive also applies to marine areas apart from terrestrial ones. Thereby, the Wild Birds Directive binds Member States to protect and conserve wetlands which are important habitats for migratory birds.

Background: Habitat Directive

The Habitats Directive presented a shift in Community nature conservation, as the focus shifted from species to habitat types. The conservation obligations arising under the Habitats Directive are generic and they apply equally to aquatic systems (marine, coastal and freshwater) and to terrestrial ones.[15]

As far as aquatic ecosystems are concerned, instead of the undefined wetland term used in the Wild Birds Directive, the Habitats Directive actually lists in Annex I a number of aquatic habitats and wetland types, such as lagoons, Mediterranean temporary ponds, active bogs, wet meadows and fens, which are of Community importance and merit protection status and special conservation measures. A number of aquatic species are also listed in Annexes II and IV. Therefore, the

12 "Member States shall ensure the establishment of a register or registers 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 of for the conservation of habitats and species directly depending on water". Article 6 para. 1 WFD.

13 Annex I, Art. 4.1 Wild Birds Directive: "Member States shall classify in particular the most suitable territories in number and size as **special protection areas** for the conservation of these species [Annex I], taking into account their protection requirements **in the geographical sea and land area** where this Directive applies".

14 Art. 4.2 Wild Birds Directive: „Member States shall take similar measures [special habitat conservation measures] for regularly occurring migratory species not listed in Annex I, bearing in mind their need for protection **in the geographical sea and land area** where this Directive applies, as regards their breeding, moulting and wintering areas and staging posts along their migrations routes. To this end, Member States shall pay **particular attention to the protection of wetlands** and **particularly to wetlands of international importance**."

15 Article 1 b Habitat Directive: "....natural habitats means **terrestrial or aquatic areas** distinguished by geographic, abiotic and biotic features, whether entirely natural or semi-natural".

network of Natura 2000 may include diverse aquatic habitats such as bogs and rivers. Even extended offshore areas may be designated since the Directive provides for the protection of marine species such as cetacean, sea turtles and their habitats.

It has to be analysed which of the protected areas of the Habitats and the Birds Directives include aquatic ecosystems. The relevant aquatic ecosystems and species have to be identified according to the annexes of the Wild Birds and the Habitats Directives. Besides these areas, in Germany it is intended to list national parks, biosphere reserves, nature protection areas, biotopes and landscape protection areas in the form of a table. For these areas maps are already existent but have to be specified for the needs of the WFD.

In some Member States the registration could be eased by the fact that maps on water protection areas are already available as well as recently developed maps within the designation process of the Natura 2000 sites. To fulfil the task of registration, NGOs could be involved which have already gained experience concerning the designation of Natura 2000 sites and thus have good knowledge about the local conditions at their disposal. In any case the water management authorities have to refer to work and data from nature protection authorities. A close co-operation seems to be helpful.

2.4 Ecological Objectives for Surface Waters

The overlap between the WFD and nature conservation aspects is particularly obvious in the definition of ecological objectives for surface waters.[16]

The WFD aims to protect the physical and biological integrity of aquatic systems. The integrated and ecologically oriented assessment of the surface water status with its corresponding objectives are central instruments to reach these aims.

The overall objective of the WFD is a 'good status', to be achieved for all waters by December 2015. For surface waters, 'good status' is determined by a 'good ecological' and a 'good chemical status'. Ecological status is determined by biological, hydro-morphological (e.g. the habitat conditions) and physico-chemical quality elements. The point of reference is given by the biological parameters of undisturbed waters. These are waters with only 'very minor' human impacts. It is this 'integrative' approach, extending the current chemical water quality targets to water quantity, habitat quality and biological targets, which constitutes the major link between water protection and nature conservation aspects.

However, the application of ecological assessments and the exact definition of the 'good ecological status' objective need further clarification. In its Annexes II and V, the WFD gives a first 'guideline' with work instructions and normative

16 The following text refers to EEB, 2001, Handbook on EU Water Policy under the Water Framework Directive.

definitions. Specific numerical values, e.g. to characterise 'good ecological status', still need to be developed by the Member States.

The overlap between water management and nature conservation issues becomes obvious in several steps important to implement the WFD.

2.4.1 Establishing type specific reference conditions

For each of the several hundred types of water bodies, type-specific hydromorphological and physico-chemical conditions must be established. These conditions should represent the high ecological status defined in Annex V, which means a status with 'no or only very minor human impact'. Type-specific biological reference conditions will be derived from this. It must be ensured that there is a reasonable reference system, which presents the best possible approximation of values for undisturbed biological conditions.

In the context of overlapping between water management and nature conservation aspects, the following questions seem to be of particular importance:

- Whose task is it to define a "high ecological status?
- Are nature conservation authorities involved in the definition of reference conditions?
- Are there different approaches in water management and nature protection for defining a "status with very minor human impact"?
- How should one go about finding one body of water for each type of water body that shows no or only slightly altered morphological and physico-chemical conditions? For many types, undisturbed water bodies do not exist in Europe any more, so that models might be used to predict these conditions and derive the biological parameters. In the models, predictive methods may be applied as well as historical data (e.g. from lake sediments). Because of the lack of natural waters in the EU, models and predictions are likely to be used extensively, raising concern about the reliability of the respective reference conditions.

2.4.2 Setting harmonised class boundaries between high/good/moderate status

The WFD obliges Member States to define what the boundaries separating high status from good status and good status from moderate status shall be. The class boundary between good and moderate has to be sufficiently stringent, since it will determine the level of the good ecological water status objective.

Annex V of the WFD gives normative definitions of the quality classes: high status, good status and moderate status. Member States are required to express the results of their assessment systems as ecological quality ratios. The national setting of class boundaries will be followed by a Commission-facilitated intercalibration exercise in order to ensure consistency.

In the context of the overlap between water management and nature conservation aspects, the following questions seem to be crucial:

- What is the class boundary between a high and a good status?
- Are there different approaches in nature conservation and water protection?
- What is the class boundary between good and moderate (with moderate status waters failing the goals of the Directive)?
- Who is involved defining the class boundaries?

2.4.3 Monitoring

Member States have to establish an appropriate monitoring network for the ecological and chemical status and the volume and level or rate of flow (as relevant to the ecological and chemical status).

The monitoring operation has to cover at least the parameters indicative of each quality element. This means that out of each quality element, indicative parameters can be chosen, which are then monitored and compared with the relevant reference condition. By comparing this parameter value with the value of the parameter under the high status reference condition and the intercalibrated class boundaries, each element can be defined as high, good, moderate, poor or bad.

The overall ecological status of a body of water is defined as a combination of biological and physico-chemical results. If, for instance, biological results indicate moderate status while physico-chemical results indicate good status, the overall ecological status will be moderate.

In the context of the overlap between water management and nature conservation aspects, the following questions seem to be crucial:

- How is the biological or physico-chemical quality exactly classified? It is unclear how the aggregation of the different values of the biological and physico-chemical quality elements will be undertaken.
- Is the status good when all or some percent of the parameters for each quality element reach values which are at or above the level for good status? Or does the worst element determine the status?

In protected areas the programmes for monitoring the water status in river basins have to be supplemented by those specifications contained in Community legislation under which the individual protected areas have been established, i.e. the Habitat or the Wild Birds Directive.[17] For the Habitats Directive this includes monitoring the so called favourable conservation status. If Habitat or species protection areas are identified as being at risk of failing to meet their environmental objective under Article 4, specific (operational) monitoring has to

[17] Article 8 para.1 WFD.

be carried out. The monitoring is to be carried out to assess the changes in the status of such bodies resulting from the programme of measures under the WFD.[18]

The following questions should be addressed in this context:

- What are the specific monitoring tasks to be fulfilled under the WFD, the Habitat and the Birds Directive?
- Who will be involved in the monitoring of aquatic ecosystems?
- Are there synergy effects leading to a reduced necessity for human or financial resources?
- Could the WFD be an instrument for monitoring gaps arising from the Habitats and Birds Directive?

It seems that monitoring in particularly requires a strong co-ordination between different administrations and stakeholders to work together and set up the programme of measures.

2.4.4 Heavily Modified Water Bodies

The links between water management and nature conservation aspects are obvious in the context of designation of "heavily modified water bodies". Because of the fact that the ecological objectives for artificial or heavily modified water bodies are substantially lower than for other bodies of water subject to the good ecological status objective, it will be a very important decision to determine which bodies of water will be designated as 'artificial' or 'heavily modified'.

Member States may designate a body of surface water as artificial or heavily modified[19]

- if the achievement of 'good ecological status' would have adverse effects on the wider environment or some specific activities (navigation, water supply, flood protection and other important sustainable developments);
- and if 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.

Against the background of the importance of the designation of the areas, the following questions should be discussed among nature conservationist and water management people:

- What is an 'important sustainable development'?
- What is meant by a 'significantly better environmental option'?

A very wide and ambiguous definition of conditions for the designation of 'heavily modified and artificial waters' could be used for virtually all water bodies.

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18 Annex V, 1.3.5 WFD.

19 Article 4 para.3 WFD.

Additionally, for the definition of a high ecological potential as an objective for artificial or heavily modified water bodies, several criteria developed from a nature conservation side have to be considered. These include:

- Quantity and dynamics of flow in keeping with ecological criteria,
- Composition and abundance of aquatic and benthic flora and fauna,
- Structure and substrate of the bed of the water body,
- Approximation to ecological continuum,
- Availability of spawning and breeding grounds for water body flora and fauna,
- A riparian/shore zone corresponding to natural structure,
- The association of the water body with its surroundings (wet meadows, river arms, wetlands, and riparian vegetation),
- The connection of surface waters to groundwater body.

These criteria should be elaborated commonly from a nature conservation and a water management point of view. This implies an extensive exchange of information and co-operation.

2.4.5 Economic analysis

One further requirement of the WFD is to produce an economic analysis.[20] The objective is to allow judgements to be made regarding the most effective combination of measures in respect to water uses based on the potential costs of such measures.

Wetlands are recognised as one of the most attractive and productive ecosystems within the European Union. Particularly their positive effects on the purification of waters but also their function as retention areas for floods are widely known.[21]

Against this background it seems to be recommendable that all measures aiming at the re-creation and restoration of wetlands shall be included in the economic analysis.[22] Taking into account the economical value of the above mentioned functions of wetlands it is possible that recreation of wetlands is a cost effective solution to achieve a good status of waters.

2.5 Groundwater

The protection of groundwater is part of the integrated approach of the WFD. For groundwater, the least possible changes to good groundwater status shall be ensured.[23] A good groundwater status means the status achieved by a

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20 Article 5 WFD.

21 Natura 2000, 14 April 2001.

22 F. Barth, 2000, The Importance of Wetlands for Delivering the Environmental Objectives of the Water Framework Directive.

23 Article 4 para.5 b WFD.

groundwater body when both its quantitative status and its chemical status are in the least good.[24]

With a view to nature conservation issues, the quantitative aspect of groundwater is of particular importance. It is acknowledged that the quantitative status of a body of water may have an impact on the ecological quality of surface waters and terrestrial ecosystems associated with that groundwater body.[25] According to the WFD, a good quantitative groundwater status is achieved when the amount of water abstraction and the degree of pollution does not result in a significant damage to terrestrial ecosystems which directly depend on the groundwater body.[26] If groundwater abstraction or drainage results in lowering the groundwater level, the water supply of vegetation is endangered and in most of the cases ecosystems are irreversibly damaged. Terrestrial ecosystems can also be damaged if groundwater levels are artificially raised for example in flooding coal mines. Vegetation not adapted to high level groundwater can be damaged. This shows the mutual dependencies between groundwater and the status of terrestrial ecosystems.

In Germany nature conservation authorities are consulted for the identification of groundwater dependent ecosystems.

In this context, the following questions remain open:

- Which areas of the habitat Directive are dependent on groundwater?
- What constitutes a "significant damage to terrestrial ecosystems"?

It also seems that concerning the overlap between groundwater protection and nature conservation several co-ordination needs arise with the WFD.

2.6 River Basin Management Plans and Programmes of Measures

Every decision about the use or interference with the aquatic systems within the river basin district should take place in principle in an integrated and co-ordinated manner and be laid out in so-called River Basin Management Plans. The initial River Basin Management Plan for each river basin district will have to be completed by December 2009 and reviewed and updated every six years thereafter (2015, 2021 etc).

For waters for which the analysis shows that they do not yet achieve the specific objectives, programmes of measures will have to be adopted. Member States (or the authority responsible for the respective river basin district) will also have to explain how the adopted programmes of measures apply the WFD rules to the river basin district and how they are expected to achieve the objectives under Article 4.

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24 Article 2 No. 20 WFD.

25 Preamble No. 20 WFD.

26 Annex V, 2.1.2 WFD.

Each programme of measures shall include "basic" and "supplementary" measures.[27] Amongst others, basic measures are the minimum requirements and consist of required measures under the Habitats and the Birds Directives. Besides this direct link to nature conservation aspects, the catalogue of basic measures shall also include measures to ensure that the hydromorphological conditions of the bodies of water are consistent with the achievement of the required ecological status.[28] The measures also include flood prevention or warning systems.[29]

In this context the following questions should be answered:

- What are the measures required under the Habitats and the Birds Directives?
- Who is responsible for the implementation of the measures under the WFD?
- How can synergy effects be identified?

Against this background it seems to be considerable to co-ordinate management plans with the NATURA 2000 plans. Not only the establishment of river basin management plans but also the implementation of measures must be linked and co-ordinated with nature conservationists. A fruitful co-operation should start with an in-depth exchange of information. The acceptance of river basin management plans also requires the consideration of interests from agriculture and fishery and private nature conservation organisations.

The co-ordination requirements of the WFD are forcing the different administrations and stakeholders to work together in setting up the programme of measures.

27 Article 11 para. 3 WFD.
28 Article 11 para. 3 (i) WFD.
29 Article 11 para. 3 (l) WFD.

3 Conclusion

There are several direct links between the WFD and nature conservation Directives such as the Habitats and the Birds Directives. It is however mainly the integrated approach of the WFD which constitutes the closest link between these two areas. The WFD does not only protect water bodies but also aquatic ecosystems and terrestrial ecosystems dependent on water. This implies that traditional water protection and management approaches have to be complemented by methods and approaches from nature conservation.

Questions arising in aquatic ecosystems such as the definition of a high ecological status can be answered from a nature conservation perspective as well as from a water management perspective. The approaches might use the same methodology but differ in the conclusions. The WFD urges both sides to find common objectives and solutions. Thus the WFD constitutes a chance to overcome the old sectoral management approaches with their negative impact on wetlands and aquatic ecosystems.

Despite the existence of Nature Conservation Directives like the Habitat and the Birds Directive, aquatic ecosystems like wetlands are still under high pressure resulting from human activities. It seems that key factors for successful wetland management such as water needs of wetlands are not sufficiently addressed in national and European legislation. Against this background, the approach of the WFD might provide the instruments for a new nature conservation policy adequately addressing the water related issues of ecosystems.