CHAPTER 1. GENERAL INTRODUCTION

During the 2001/2002 Common Implementation Strategy (CIS) of the Water Framework Directive (WFD) a series of Guidance Documents (GD) concerning different aspects of its implementation were developed by representatives of Member States (MS), Accession Countries, National experts and the European Commission.

In order to test and cross validate these GDs, a network of Pilot River Basins (PRBs) has been established. It was foreseen that such as network would contribute to the implementation of the WFD directive, leading in the long-term to the development of River Basin Management Plans. Several countries have proposed river basins and associated coastal zones within their territory taking into account the different aspects:

- Covering the maximum number of Ecoregions
- Commitment and resources for testing the GDs in this voluntary exercise
- Participation of local, regional and national competent authorities, i.e. water management administrations
- Active involvement of NGOs and stakeholders.
- Dealing with the maximum number of pressures and environmental problems
- Including transboundary river basins with all the involved partners
- Representative of the data availability in MS.

The Pilot River testing of the GDs has started in 2003 and should be finalized by the end of 2004. It is lead by the Strategic Co-ordination Group (SCG) jointly with the MS and Institutions in the selected PRBs. The Institute for Environment and Sustainability at the Joint Research Centre (IES-JRC) acts as the technical secretariat and constitutes a part of the Working Group 2B for Integrated River Basin Management co-lead by France and Spain. Figure 1 summarizes the fifteen Pilot River Basins that have been proposed to date. These are: Cecina (Italy), Guadiana - Portuguese part- (Portugal), Jucar (Spain), Marne (France), Moselle-Sarre (France, Germany, Luxembourg), Neisse (Germany, Poland and Czech Republic), Odense (Denmark), Oulujoki (Finland), Pinios (Greece), Ribble (UK, England), Somes/Szamos (Romania, Hungary), Scheldt (Belgium, France, The Netherlands), Shannon (Ireland), Suldalsvassdraget (Norway) and Tevere (Italy).

The specificity of the testing versus the real implementation is that the testing should be a front-runner of the actual implementation. A Terms of Reference (ToR) document was developed that focus on *Key Issues* felt to be of particular relevance by WG leaders. Reporting in the context of the PRBs activities concentrates therefore only on these *Key Issues* that refer to operational aspects which may be addressed and solved after the guidance's application to real cases.

Considering that:

- Actual implementation of the WFD is already taking place in many countries
- The reporting from Member States to the Commission on specific issues of the Directive such as Article 5 and its Annexes is required in a relative short time.

The WFD implementation should then take advantage as much as possible of the Pilot River Basin activities. For this reasons it was agreed that GDs concerning Article 5 should be tested in a first step. The remaining GDs will be tested afterwards and then Pilot River Basins Network will concentrate on producing the Program of Measures and a River Basin Management Plan.

- Therefore, this report constitutes the first synthesis of results from the integrated testing of the GDs related to Art. 5. Considering:
- The short time available,
- The amount of effort put by the Pilot River Basins,
- The results already obtained in terms of information, gaps, problems/solutions, missing parts, etc;

it is possible to conclude that the exercise can be considered a success and that dissemination of the results is now a crucial step to help river basin managers in the first steps of the WFD real implementation.

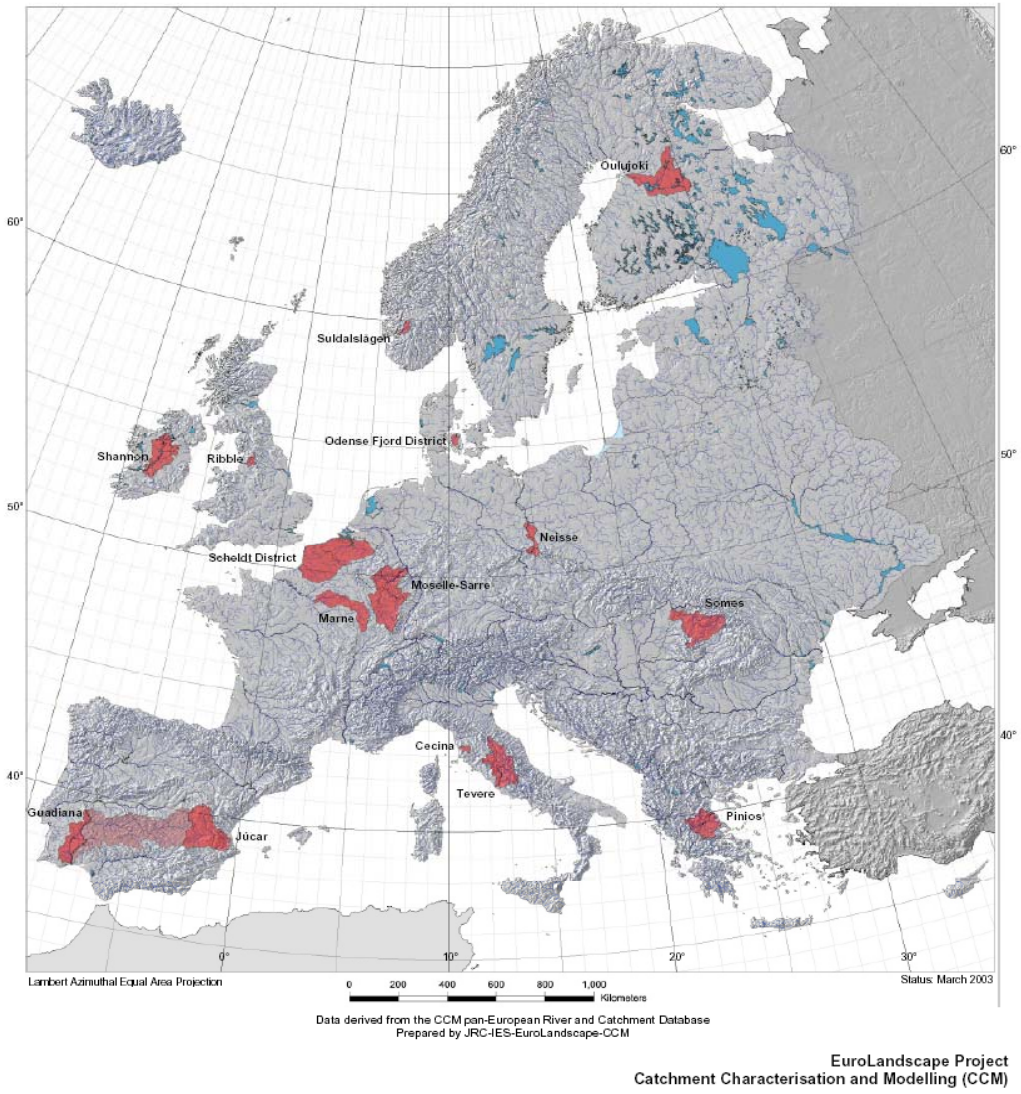

Figure 1. The Pilot River Basin Network.

CHAPTER 2. CONTEXT OF PRB TESTING: A RICH DIVERSITY

The most striking feature found in the PRBs exercise is the rich diversity one encounters, which in turn reflects the enormous diversity one will have to expect when the WFD will be implemented.

This diversity has several aspects we are briefly going to comment:

- Geographical distribution: The PRBs cover 12 (1, 3, 6, 8, 10, 11, 13, 14, 17, 18, 20, 22) of the 25 ecoregions for rivers and lakes and 4 (1, 4, 5,6) of the 6 ecoregions for transitional waters and coastal waters defined by the WFD: Annex XI, maps A and B, respectively. For example, Iberic-Macronesian region for rivers and lakes is represented by the Guadiana- Portugese side- and the Jucar rivers whereas Baltic sea for transitional and coastal waters is represented by the Oulujoki river. Furthermore, the pilot river basin cover a wide range of sizes from 900 Km^2 of the Cecina –small, Mediterranean, few authorities and high degree of participation- to 37170 Km^2 of the Scheldt –international, highly industrialized, may authorities, complex river management, political sensitive- .
- Transboundarity: One important characteristic to consider concerns the trans national versus the national character of the testing. This is related mainly to the amount of additional work needed to coordinate the activity between several MS and CC, language barriers, management approaches and data availability. In the PRB exercise there are four transboundary pilot rivers: Moselle-Sarre (Germany, France, Luxembourg, Belgium), Neisse (CZ, Germany, Poland), Scheldt (Belgium, France, The Netherlands) and Somes (Romania and Hungary). For example, the Neisse has asymmetric water management systems which makes data difficult to compare.
- Pressures: Also in this characteristic there is a rich variety from the Suldalsvassdraget with a scattered population within the basin area amounting to approx. 3000 persons but with a strong regulation of the basin for hydropower generation (the river accounts for a 5.4% of total Norwegian electricity production) to the Marne with 2.8 Million of inhabitants – the Marne river basin is considered as the main source supplying fresh water to Paris and sb.-, intensive agriculture and strong industrial presence.
- Existing data: Another important aspect when testing the GDs was to have several levels of data availability to assess different approaches it is possible to use, from the application of validated models at the basin scale, to statistical analysis of existing data, to expert judgement where data is scarce or not available. For example, the Odense river –small, few authorities, agricultural- has relatively long historical data series due to the appearance in 1973 of the first Danish Environmental Protection Act, whereas the National Surface Quality Monitoring Network organized by the Greek Ministry of Environment, Physical

Planning and Public works was designed in 1992 and consequently less historical information is available in the Pinios pilot river.

Number of GDs to be tested: There are also important differences between the number of GDs to be tested. For example the Ribble proposed to test only the Public participation GD whereas Tevere, Pinios and Scheldt rivers have proposed to test all GDs. In an intermediate position there is, for example the Shannon River that has tested 5 over the 7 GDs requested for Art. 5. Table 1 give an overwiew about the GDs that will be tested by the PRBs, while Table 2 summarizes the status at 16th October concerning the proposed GDs, linked with Article 5, to be tested and the received answers from PRBs.

River Basin	ART 5 Water Bodies	ART 5 IMPRESS	HMWB	ART 5 REFCOND	ART 5 COAST	Inter calibration	ART 5 WATECO	Monitoring	ART 5 Ground Water	ART 5 Public Participation	Planning Process	GIS	Wetlands
Odense/Fjord													?
Oulujoki													?
Mosselle-Sarre													?
Marne													?
Neisse													?
Somes/Szamos													?
Scheldt													?
Pinios													?
Shannon													?
Guadiana													?
Jucar													?
Tevere													?
Cecina													?
Suldalsvassdraget													?
Ribble													?

Legend		
		The PRB is testing the GD.
		The PRB is not testing the guidance.
	?	To be clarified.

Table 1: Overview GDs tested by the PRBs

River Basin	Water Bodies	IMPRESS	REFCOND	COAST	WATECO	Ground Water	Public Participation
ODENSE/FJORD	x	x	x	x	x	x	x
OULUJOKI	x	x	x	x		x	x
MOSSELLE-SARRE	x	x			x		
MARNE	x	x			x	x	x
NEISSE	x	x	x				
SOMES/SZAMOS	x				x		
SCHELDT	x	x	x	x	x	-	x
PINIOS	x	x	x	x	-	x	x
SHANNON	x	x	x	x		x	
GUADIANA	-	-	-	-	-	-	
JUCAR	x	x	x	x	x	x	x
TEVERE	x	-	-	-	-	-	-
CECINA	-	-	-			-	-
LDALSVASSDRAGET	x	x	x				-
RIBBLE							-
	x	**PRB** IS TESTING THE GD AND ALREADY SENT THE ANSWERS TO THE TOR					
	-	**PRB** IS TESTING THE GD BUT DIDN'T SENT YET THE ANSWERS TO THE TOR					
		PRB IS NOT TESTING THE GD					

Table 2: Overview GDs linked with Art5 tested by the PRBs and delivered. Documents.

ANNEX I

GD 2.1: PRESSURES AND IMPACTS

General issues:

The Guidance document on pressures and impact was supposed to be tested on the following 12 PRBS: Suldal (Su), Jucar (Ju), Oulojoky (Ou) , Mosel/Saar (MS), Neisse (Ne), Odense (Od), Marne (Ma), Pinios (Pi), Shannon (Sh), Tevere (Te), Cecina (Ce), Scaldit (Sc). So far answers (complete or partial) have been provided by 10 PRBs and are summarized in the following Table.

	Su	Ju	Ou	MS	Ne	Od	Ma	Pi	Sh	Te	Ce	Sc
Criteria for significant pressure	X	X	X	X	X	X	X	X	X			X
Impact indicators and threshold	X	X		X	X	X	X		X			X
DPSI(R) concept	X	X	X	X	X	X	X	X	X			X
HMWB	X	X		X			X	X				X
Baselines						X						
Aggregation for reporting	X	X	X	X		X	X		X			
Water management issues	X		X	X			X		X			

Key issues:

QUESTION: IS THE LIST OF "PRESSURES" AND THE RELATED "CRITERIA" ADEQUATE AS A BASIS TO DEFINE THOSE SIGNIFICANT PRESSURES AT WATER BODY LEVEL THAT POSE A RISK OF FAILING TO MEET THE ENVIRONMENTAL OBJECTIVES?

The responses are quite mixed however, overall it seems that the list of pressures listed in the IMPRESS documents are adequate.

- It is stressed however that the list strongly focuses on pollution sources while not sufficient attention is given to morphological pressures, and pressures linked with water use and management, which seems to be the case in Norway. This point is also underlined by the Scheldt. In this context a integration of the HMWB analysis and the analysis of potential significant pressures is recommended by

Suldal.

- The Mosel/Saar PRB would have preferred a more detailed and more extensive list of criteria for identifying significant pressures, especially when it comes to groundwater. Others (Marne; Shannon) appear to be more skeptical about absolute criteria for individual pressures and therefore look for integrated approaches that take into account the potential impact. Oulujoki have not determined yet the criteria for assessing the significance of pressures.
- A major issues emerges from the fact that some PRBs can not see how a detailed analysis including the whole list of pressure at a water body level could be conducted considering the large number of water bodies present in their catchments (Odense). Furthermore such detailed analysis would require a huge amount of data that might not be available (Neisse), or could not be done in a timely manner (Scheldt).
- Some of the responses included details about local approaches to identify pressures (Jucar), and how the list of pressures was included into a methodological risk assessment approach (Shannon).
- It appears that the LAWA screening tool has been used in several PRBs to start the pressure and impact analysis

QUESTION: IS THE LIST OF "IMPACT INDICATORS" AND "THRESHOLD SIZES" ADEQUATE TO ASSESS THE RISK OF FAILING TO MEET THE ENVIRONMENTAL OBJECTIVES?

Most of the responses agree that even though the list of impact indicators is quite thorough and complete, there is a lack of specific threshold values. Suldal and Mosel/Saar call for a more specific list of indicators combined with specific threshold values.. It seems that many PRBs will rely on already national thresholds values when possible for conducting the pressure and impact analysis as no specific values are given in the guidance document or are not yet available.

- several PRBs noted the necessity to include water bodies vulnerability in the analysis process
- several PRBs also stressed the need of data in order to assess the state of water bodies, which are not always available, in particular as far as impacts from changes in the hydrological regime or in the morphology of the water bodies are concerned, whereas the data availability concerning the physico-chemical quality elements is better although quite often not yet disaggregated to the water body level.

Marne hints to the limits of indicators with regard to assessing the biological impact and recommends the use of additional sources of information like expert judgement, modeling results, investigative monitoring.

It is highlighted that the criteria and thresholds can be helpful to identify a potential impact but are not sufficient as a basis for a decision whether a water body might be

at risk of failing to meet the good status.

QUESTION: IS THE DPSI(R) CONCEPT APPLICABLE IN PRACTICE?

Most of the PRBs agree on the applicability of the DPSI(R) framework even though the various PRBs are at various stages of implementation of the process, especially the response part that should be tested later on.

- One of the major concern is that the distinction between "state" and "impact" is not always clear as mentioned by the Scheldt, Neisse, and the Odense
- Different methodologies are being used going from expert judgment (Odense), to simple and sophisticated models (Mosel/Saar, Odense, Neisse)
- The Czech part of the Neisse states that the DPSI(R) framework is only applicable to large basins, and has limited applicability to small water bodies due to extensive data requirement
- It was also underlined that clear links between impact and pressures do not always exist

QUESTION: HOW WAS DEALT WITH THE PROVISIONAL IDENTIFICATION OF HMWB AND WB?

Many PRB made reference to the HMWB guidance for a detailed answer (Scheldt, Suldal, Mosel/Saar, Marne). Work is still under progress for the Scheldt, Shannon. For Suldal, a screening of hydropower installation was carried in the identification of water bodies.

- Many PRBs noted the lack of available definition of good ecological status. For the Jucar, since no definition is available concerning good ecological status, it classified the HMWB only on significant hydro morphological alterations using the following criteria: large reservoir or dams, urban river stretches, water bodies downstream of dams, and artificial channels. The Marne performed the classification of the HMWB independently from the pressure and impact analysis. Mosel/Sar also stresses the lack of available definition of good ecological status in relation to HMWB.

QUESTION: HOW WAS DEALT WITH THE IMPACT OF "AUTONOMOUS DEVELOPMENTS" AND "EXISTING POLICIES" IN THE IMPACT ASSESSMENTS?

Most of the responses state that work concerning autonomous development and existing policies is still underway or has not been assessed yet (Jucar, Oulujoky, Shannon. Scheldt). Some research work is performed on the Odense to assess the trend in

agricultural production and expected trends in wastewater discharge in response to improvement already decided. Mosel/Saar stresses the necessity to take into account the requirements of other EC directives and the respective schedules for implementing these directives, the measures required by existing national or regional legal obligations or political decisions as well as all existing information on already determined developments like the closing down of industrial sites.

QUESTION: HOW IS/WILL THE GAINED INFORMATION BE SYNTHESISED TO BECOME THE OFFICIAL ART. 5 REPORT FOR THE COMMISSION?

- For the Suldal, the gathered information can be presented at different aggregation levels from natural boundaries (basin, sub-basin) to administrative units. Aggregation level will depend upon the EU decision on reporting requirement. Similarly, the Oulujoky waits for guidance from the CIS reporting group. No answer was possible for the Scheldt because work is still under way.
- For the Mosel/Saar information could be aggregated at water body scale, river basin or management unit. The final scale will take into account the clarity of the information to be provided
- Jucar will report results at the water body scale.
- For the Odense and the Shannon the scale of the GIS map will dictate the degree of aggregation. However, guidance on the EU requirement is needed.

QUESTION: HOW TO IDENTIFY SIGNIFICANT WATER MANAGEMENT ISSUES (ART 14.1 WFD)?

Jucar and the Scheldt are still investigating the issue of identification, while for the Odense this process will only be possible once the pressure analysis is completed.

- For the Marne PRB, the most significant problems linked with human activities are already known and have been identified independently from the WFD implementation. Similarly, for the Shannon some issues are known a priori, the human impact analysis will confirm a posteriori the significant issues in a consistent and transparent manner.
- For the Suldal, the major issue is the need of a tool for data collection and management, with the requirement that all data be linked to the River Network.
- For the Mosel/Saar a modelling approach has been used to asses the impact of urban and industrial waste management
- Oulujoki has organised stakeholder workshop concerning this issue

QUESTION: CLARITY OF THE GUIDANCE

Answers to this question were given by Suldal and Mosel/Saar. For the latter, the shortcome of the guidance is that no threshold is given for groundwater, and it is expected that this will be remediated by the groundwater daughter Directive. For Suldal, the guidance lacks clarity and could be improved in the link between IMPRESS and HMWB guidance. Suldal also requests to provide a better description of what the recommendations are concerning the assessment of the impact of different pressures.

GD 2.3: REFERENCE CONDITIONS.

General issues.

It emerges from the answers that the establishment of reference conditions for surface water bodies in the pilot river basins is at the early stages of the implementation due to different reasons. Firstly because the spatial based approach seems a priori the most desirable way to proceed for PRB since it is the most direct, suitable and trustful of them, and so this method is applied whenever possible. But the main difficulty for its implementation, besides the requirement of infrastructure, lye on finding sites within basins for all the homogeneous regions (ecoregions) with no or very minor deviation from undisturbed conditions. Secondly because as a result of it, PRB have to use indirect methods as predictive models or temporally based techniques like historical data o paleo-reconstruction which are time-consuming to set up since they need to be calibrated and validated for each ecoregion and water body type they are created for. This has led to adopt expert judgment or the use of the practical pressure criteria approach as the interim last resorts in many cases, while the others methods are tuning. And finally because the final step of setting RC is the validation and the establishment of value for the boundary between classes will be established through the intercalibration exercise to be finished by the end of 2006.

Key issues.

AVAILABILITY OF INFRASTRUCTURES.

The availability of infrastructure on expertise, databases, models and organizational structure is present in more or less extent in all River Basin Districts, though its grade vary from basin to basin. The next conclusions can be drawn from the responses to the ToR.

Several PRB (e.g. Sudal, Odense) agree that while their infrastructure provide good level of information for the broad surface of the basin, there is a need for improvement in some parts of the basin because "...almost no data exist." or some type of information "is well known for major catchments, but not for small areas", or that monitoring network provide not enough information for small streams, and so on. Others PRB giving the intricacy of the subject have set up an expertise group for dealing specifically with the establishment of RC (Odense, Shannon, Scaldit)

There are a diversity in the use of the monitoring network, some PRB are using the monitoring network for surface waters which is run and established at level state (Neisse), while others is using its own network specially set up for the follow-up of its currently in

force Water Management Plan in its territorial domain (Jucar).

The joint apply of models and land use coverage as a practical pressure criterion seems the more common and appropriated approach adopted by PRB for assessing the impact associated to pressures on diffused pollution (Oulojoky, Odense)

WATER BODY DELINEATION SYSTEM.

There is a common position of the majority of Pilot River Basins for all types of water bodies on the use of System B (Annex II, WFD).

Obligatory factors of system A are also being used as a regular basis for this matter, though some basins report there is a lack of information (e.g. in the Suldal basin depth data are not available for Norwegian lakes) .

Some of the PRB (Jucar, Odense) are still deciding which factors of system B will use jointly with the obligatory factors of system A. For instance the Jucar PRB is conducting a spatial analysis technique for the defining and characterization of ecotypes/ecoregions prior to the selection of the factors, while the Odense due to the abundance of relatively small waterways have proposed the use of special factors and tested an alternative typology in a particular sub-basin.

It is to note that some of the pilot basins (Shannon, Jucar) are doing the delineation of water types within the context of an ongoing national program.

Finally the Flanders part of the Scaldit basin reports that it has not been decided yet which system to use for lakes.

PRACTICAL PRESSURE CRITERIA.

From the answers it follows that the majority of basins are making use of this criteria in greater or lesser detail for the identification of reference conditions sites and the quality class boundaries. Yet, this is an ongoing activity and no final result are available for any basin.

The exemption is the Odense basin which to date justify the decision for not to use it on two basis: first because currently there is no sufficient knowledge of pressures, and secondly due to the enough availability of information on ecological status. That is why postpone its use for future process and more especially for the establishment of ecological class boundaries.

On the other side is interesting the proposal adopted by the Jucar basin as a preliminary evaluation of reference sites that will use models for carrying a quantitative analysis of pressures and impacts, which produce a preordination list of water bodies indicating the level of pressure.

Generally it may be concluded (Scaldit, Jucar) that the list provided by table 2 covers all

possible spectrum of pressures which lead to assessment of ecological impact.

On the other hand drawbacks were reported for the implementation related to:

Subjective interpretation and should consider also water quality trend criteria (Oulojoky),

Practical Pressure Criteria is "a useful initial screening tool but not a basis for reference condition establishment" (Shannon), and finally

Not enough data to characterize all quality elements mentioned in table 2 (Odense).

In addition, the practical pressure criteria is been considered as a tool for risk assessment of failing to achieve the GES, as an alternative and parallel method than more direct and suitable techniques (spatial analysis, predicted modeling), but it is also clear by the answers that the method to put it in practice is still being developed (Suldal, Jucar).

SETTING REFERENCE CONDITIONS.

It follows from the answers that whenever possible the spatially based method is the most desirable option for the establishment of Reference Conditions (Suldal, Jucar, Oulojoky, Odense, Shannon, Scaldit). Nevertheless, two simultaneously conditions are needed for its implementation: enough monitoring data and sites with low pressure and impact.

Since usually one of the two condition fails some pilot basins foresee the use of different techniques (indirect methods, paleo-reconstruction, regionalizations,...,etc), but as a regular basis almost all basins agree in the use of expert judment (Suldal, Jucar, Oulojoky, Odense, Pinios, Scaldit). In particular the Pinios basin allege that due to the lack of biological monitoring data "RC will be based mainly on expert judgment", or in the case of the Scaldit "...in most cases using expert judgment".

VALIDATION

It seems from the answers that the process of establishment RC is in the early stages for all pilot river basins and no validation process has been carried out yet. Nevertheless some of the basins specifically point out that once the RC are set out, the validation practice will be done (Jucar, Shannon, Scaldit).

STATISTICAL TECHNIQUES.

The responses to this matter are quite similar to the previous one, it seems that is too early for this question since RC are not set yet. Anyway it seems that no pilot river basin is discarding to use this technique in the future.

QUALITY ELEMENTS SELECTED FOR ECOLOGICAL ASSESSMENT.

Many of the PRB are not reporting this matter since RC are not yet established, nevertheless Suldal and Oulojoky basin give some biological quality elements as a reference (phytoplankton, macroinvertebrate, etc), while Jucar and Odense basin have not especially disregard any quality elements since the process of setting RC is being carried out and the natural biodiversity is high and "many elements are needed to ensure a robust classification".

SETTING CLASS BOUNDARIES.

Many of the PRB are not reporting this issue, only Oulojoky specifically states that will use the "a priori" method but only the phytoplankton data was sufficient enough to test the setting of the class boundaries. It seems that is too early for this question to be asked and should be addressed during the intercalibration exercise.

GD 2.4: COAST.

Introduction

The Pilot River Basins network has been established to test the Guidance Documents for the implementation of the Water Framework Directive (FWD). There are 15 Pilot River Basins (PRB) proposed to date and 8 PRBs ,i.e. Jucar, Oulujoky, Odense, Pinios, Shannon, Guadiana, Tevere, Scaldit, had agreed to test the Guidance Document on Typology, Reference Conditions and Classification Systems for Transitional and Coastal Waters (COAST).

The report is based on the responses from the PRBs submitted through the questionnaire Terms of Reference (ToR).

This is a preliminary report as not all PRBs have completed this exercise (6/8 answers).

Key points raised from the answers related to the testing of the Guidance Document

General Issues

According to the PRBs answers, the GD is well written but there are three important aspects that could be improved:

Even though in the GD is stated that regular interaction with experts from other Working Groups of the CIS had occurred the PRBs felt that cross references and a common approach between GD 2.2 (HMWB, coastal part) and GD 2.3 (REFCOND) is not fully developed.

Concrete examples are needed on:

How to define the limit between transitional and coastal waters?

Which are the best practices?

The GD does not answer in how to establish Reference Conditions

Key Issues.

DEFINING SURFACE WATER BODIES

There are several different responses to this question. The Directive defines coastal waters

(Article 2(7)) as "surface water on the landward side of a line, every point of which is at distance of one nautical mile of the seaward side from the nearest point of the baseline from which breadth of territorial waters is measured, extending where appropriate up to the outer limit of transitional waters". This is the Jucar answer based on already national legislation (Decree 627/1976) and Oulojoky using GIS-based data. This is the first step as proposed for the hierarchical approach to the identification of water bodies, but then it is necessary to divide the coastal/transitional waters into types using factors listed in Annex II (System A and B). For example Odense and Pinios have chosen system B whereas Shannon would had preferred System A but typologies are being developed at the moment.

ASSIGNING COASTAL WATERS WITHIN THE RIVER BASIN DISTRICT

This assignation has been carried out following existing administrative boundaries (Jucar, Oulojoky, Odense, Pinios and Shannon). No problem of cross influence between river basins districts has been reported yet. However, there is no answer for the case of big watersheds as Guadiana and Scaldit where its influence may extend to boundary river districts.

COASTAL LAGOONS

The question of the ToR concerning the differentiation of lagoons between coastal and transitional has not been answered because there were no lagoons (Oulujoky, Odense or Scaldit) or because its identification has not been completed yet. A clear example is missing and could help other river basins on this issue.

COASTAL AND TRANSTITIONAL WETLANDS

The answers to the question concerning the association between transitional and coastal waters and wetland have been answered in different ways. Some PRBs like Jucar and Odense ensures a high degree of registration of wetlands, due to the national legislation and also because the wetlands are part of the Nature 2000 Network. Other basin, i.e. Pinios, Shannon and Oulojoky did not answer due to lack of data or not presence of wetlands in the basin.

DEFINING TRANSITIONAL WATERS

Several problems have appeared in this aspect. Pinios and Odense has chosen to define

only coastal waters. In the first case due to physiographic features of the river mouth whereas in the Odense because there is no a clear indication in the Guidance for what is meant by "substantially influenced by fresh water flows" in the WFD definition and the special salinity situation in the Baltic Sea. Oulujoki employed a mixture of the first three approaches suggested by the GD: using the boundaries defined under other European and national legislation such as the Urban Waste Water Treatment Directive (method 1), Salinity gradient (method 2) and Physiographic features (method 3). Jucar has still not identified their transitional waters but there is an study being conducted. The modeling method (method 4), was not use by any PRBs. Odense reports some critics to the GD especially in the lack of consistent quantitative approach.

SIZE OF TRANSITIONAL WATERS

The minimum size of transitional waters of 1 km^2 suggested by the GD was considered useless. Shannon report minimum size of 0.1 km^2 and maximum size of 124 km^2. Jucar, Pinios and Oulojoky did not report with quantitative data to this question while Odense did not comment the issue for similar reasons as stated above.

DESCRIPTORS FOR TYPOLOGY/ OPTIONAL DESCRIPTORS.

Oulojoky and Scaldit did use the descriptors in the GD, but the Scaldit PRB did not consider the order as a ranking. Oulojoky introduced several modifications, i.e. 30m depth is high for the definition of shallow waters, they used 20 m instead; salinity 3‰ was used. Odense underline that they applied the Danish national typologization proposal, which was launched before the GDs were prepared. This national legislation is comparable with the descriptor listed in the GD for system B and, based on this proposal, there are 16 types in Denmark of which 3 occur in Odense PRB. Jucar, Pinios and Shannon, did not answer to the question.

No additional descriptors have been used in the PRBs.

REFERENCE CONDITIONS

About the methods used to define reference conditions all the PRBs answer that RC have not been established or that there is a problem with lack of data. Oulojoky could not apply the method a), b/ and c/, i.e. existing undisturbed site or with minor disturbace, historical data and models, therefore they applied the method d) expert judgement.

Odense reported that dynamic as well as empirical modelling has been used based on existing biological (macrophytes) data to establish some sort of reference conditions but further verification is needed since there is no a clear procedure to define RC in coastal waters. Being an agricultural catchment their main pressure is nutrient load on

the fjord and hence simulation has been employed to study different nutrient loads on macrophytes biomasses (Ulva sp.). They also plan to use data from similar river basins for other types of biota. i.e. macrobenthos. Furthermore, they explain that the relationships between nutrient load and response in the marine ecosystem is poorly known for several variables, i.e. HAB, fisheries, priority substances, etc.

CLASSIFICATION TOOLS

The question if any of the classification tools suggested in the Annexes were used only Oulojoky and Odense have answered. Odense report that the suggested tools are not applicable to Danish coastal waters, but some might be useful after adaptation to local conditions. Oulojoky has to adapt the methods because of highly different nature in Bothnian Bay.

CLASSIFICATION SCHEMES

There are also problems on combining all the quality elements into a single score. Again only Oulojoky and Odense answered this question. Oulojoky could use only chlorophyll a data whereas Odense stressed the need to keep the concept "one out- all out" since there will be only few variables well documented and measured for many marine ecosystems. They propose to use a running 6-year mean (which coincides with the EU reporting interval) instead of the 5 year running mean they are using in Denmark.

GD 2.6: WATECO

General Issues.

Pilot River Basins have not reported on difficulties in testing that could be linked to the content of the Guidance on Economics itself. The difficulties encountered seem to be more likely related to the lack of data or the lack of methodology. In practice, most of the PRB seem to be at the beginning of their reflection on cost recovery assessment and evaluation of environmental costs.

To fulfil this gap, some further development could be useful for some specific issues. This could be addressed within the two Drafting Groups on Economics under the umbrella of Working Group 2B (Integrated River Basin Management).

All reporting PRBs are currently involved in the data collection on water uses and water services. This data collection is well advanced in most PRBs. However in most PRBs, the analysis has not really begun concerning the repartition of costs between categories of users (cost recovery assessment). The methodologies for trend analysis have been set up or are being set up in most PRBs. For the cost recovery, lack of data on environmental costs and resource is often noticed. For the moment, no work has been done about cost-effectiveness analysis (except in Odense PRB).

Key Issues.

Some specific key issues can be distinguished:

- a lack of data for the description of water services and water uses
- a lack of data for the assessment of environmental and resource costs
- cost recovery assessment
- trend analysis
- scale (for data collection, for analysis)

LACK OF DATA FOR THE DESCRIPTION OF WATER SERVICES AND WATER USES

A list of these water services and water uses are the basis for the cost recovery assessment. In general, PRBs have used the list provided by the WATECO Guidance but they mention problems of data availability.

- **Public statistical data have been used (Somes/Szamos, Odense):** For the Hungarian part of Somes/Szamos, a huge amount of detailed data has been collected for the characteristics of water services concerning water production, water supply, water demand, wastewater treatment, irrigation water supply, other services (storages, reservoirs). The water uses have been identified and will be characterized with a number of indicators concerning agriculture, industry, gravel and sand extraction from Somes, flood control. For the Romanian part of the Somes/Szamos, general socio-economic indicators have been collected according to Romania Statistic Annual (2001). The Odense PRB used statistical information from the national Statistic Bureau.
- **The description of water uses has been more difficult than the description of main water services:** Thus, for Odense, the description of water uses and the assessment of their economic importance has been a difficult task. The main water uses identified are households, industry, public institutions, agriculture and nursery gardens, and leisure and tourist activities. There is in general a few data available, particularly for the agricultural sector, for which the Guidance document does not give suggestions or examples. In general, the water uses issues are less addressed in the Guidance than other issues.
- **Links were made with the IMPRESS activities**: The WATECO guidance indicates that internal private costs of services should be taken in the analysis where necessary. In the Marne process, it was assessed that "where necessary" would apply to services that have a significant impact on water status. As a consequence, this assessment was coordinated with the inputs from pressures and impacts. The French part of the Mosel Saar PRB underlines that works on economics and works on pressures are closely coordinated.

LACK OF DATA FOR THE ASSESSMENT OF ENVIRONMENTAL AND RESOURCE COSTS

The lack of available information about environmental and resource costs has been outlined by all reporting PRBs. To fulfil the gaps, PRBs used several types of methodologies for evaluating the environmental and resource costs.

- Simulation models: Jucar used simulation models both for evaluation of resource costs and environmental costs. The Scheldt will also use an environmental coasts model.
- Expert judgement: For the Somes/Szamos, these costs have been evaluated based on the assessment of experts panels.
- Economics methods: Marne uses a combination of three methods: current economic transfers from agriculture, industry and households towards environmental protection, assessment of willingness of citizens to pay for a better environment, assessment of costs for restoration (wetlands, river flow, treatment of pollution, etc).

Odense mentions that there is no comprehensive collection of data on environmental

expenditure in Denmark because these costs are often integrated into changes in production process. Odense underlines also the lack of methodology to take into account subsidies and incentives to agriculture and the lack of suggestions / examples of the Guidance Document in this field.

COST RECOVERY ASSESSMENT.

Pilot River Basins gave only few information about the methodology they used for cost recovery assessment. It seems that most of them did not conduct these works to the end.

The work which has been done by the Somes/Szamos PRB (shared by Hungary and Rumania) should be especially underlined. Data for year 2000 have been investigated and collected for a number of indicators. But cross-subsidy between the different economic sectors (agriculture, industry and households) could not be defined. In particular, an interesting work concerning data on efficiency of water bills collection has been conducted with Water Companies.

TREND ANALYSIS

For the Mosel Saar PRB, Rheinland Pfalz has not begun with the trend analysis. The French part will base its analysis upon past tendencies so to be able to forecast as much as possible the future tendencies. The list of indicators is not definitive but these indicators will concern the evolution of population, agriculture and industry. The Land of Saar will study the same indicators plus the environmental evolution and underlines that these evolutions will be quite unprecise due to uncertainty about climate change, technological improvements, globalization and therefore the impacts about the resource and water demand cannot be forecast.

For the Jucar it is not foreseen to conduct a trend analysis since this issue is not a competence of water administration but of the Ministry of Economics and its Departments in Autonomous Regions to which information will be requested.

The Somes/Szamos PRB is defining the methodology for the trend analysis. For the Hungarian part, an expert panel was established to identify the drivers. A qualitative description will be given for each driver in cooperation with the Romanian part. The Romanian part has evaluated the importance of the economic increase and the corresponding evolution of water demand and the necessary investments in water sector to meet the requirements of the European Directives. They have then taken into account the regional developments tendencies in the main economical sectors but they face a high uncertainty with regard to the consequences of the restructuring process of economy to the market conditions that make more difficult policy projections.

Odense used the list of potential drivers provided by WATECO guidance and considers it is as a good checklist. The business as usual scenario was developed based on the statistical forecasts of population growth, the current water consumption level for each sector, the

evolution of price elasticity and income elasticity, in order to have a forecast of the total consumption level. Losses in the pipes and unaccounted for water were also taken into account.

Marne has organized three meetings dealing with future studies to identify driving forces. Studies and forum were also conducted to determine the evolution of point source and non point source pollution.

SCALE

- **Scale for data collection:** The scale at which data are available (or not) is an important issue. The Jucar reports that lots of data needed are not known at the level of the river basin and must be requested to other levels. For the Romanian part of Somes/Szamos, data about costs are available at the level of the entire Water Division and Water Management Systems and most of data concerning socio economic indicators are available only at administrative level (county). For water user characteristics, data are mainly available at district level and there is a lack of data at sub-basin level. Economic data are often available at an administrative level when technical data (pressures and impacts) can be collected at district level.
- **Scale for analysis:** Jucar considered two scale for analysis (Jucar District and each one of the Agriculture and Urban Units) and will compare the results after aggregation. Somes/Szamos (both parts) succeeded in restructuring the available information according to hydrological boundaries and this provides high quality information but is very costly and time consuming. This was done using the publicly available statistical information and calculation of weight averages in proportion of number of population or geographical territory. For Odense, reporting on economic analysis and trend scenario were made at the Odense River Basin level but lower spatial scales have been investigated during the collection of data (municipal level) and have been aggregated at the Odense RB level. In the Mosel Saar PRB, the data were also collected at the lowest level possible (municipality) in order to use them at the level of the management unit / water body. The Marne PRB used mainly the district level but used the sub-basin level for the establishment of the baseline scenario. For the Scheldt, the economic analysis is assessed at the scale of river basin district and when possible some information can be provided at the sub-basin or regional level. It is underlined that it would be really useful to have an assessment at the level of some water bodies but this is not possible on account of cost or data confidentiality.

GD 2.8 TOOLS ON ASSESMENT AND CLASSIFICATION OF GW

General issues

Two guidance documents are particularly dealing with groundwater issues.:

The first one is the Horizontal Guidance on Identification of water bodies in which one could find a specific chapter related to bodies of groundwater. The main issues raised in this chapter are related to the delineation of bodies taking in account a first step which is the designation of aquifers focusing on two precise concepts: interpretation of "significant flow" and significant quantities of groundwater". Most of PRBs have more or less answered on the testing of the horizontal guidance.

- Similarly to surface water bodies, bodies of groundwater must be identified by 22 December 2004.
- Environmental objectives of WFD are applying to those bodies of groundwater, which means that groundwater outside of delineated bodies is only subject to the general objective of limiting the inputs of pollutants.
- The guidance insists on a large flexibility for Member states to decide upon the degree of subdivision necessary to adequately describe water status on a manageable way.
- The small water bodies may be grouped for assessing risks of failing, monitoring, reporting or management purposes.

A second guidance document related to the assessment and classification of groundwater is focusing on the statistical methods and procedure to be undertaken in order to assess pollution trends and aggregate monitoring results.

This procedure was tested in the three following PRBs:

- Denmark (Odense)
- Finland (Oulujoky)
- Spain (Júcar)

Some additional sere information was gathered at the Workshop on Groundwater Characterization held on 13th October 2003 in Brussels (joint WG 2B and 2C workshop) on the following PRBs: Pinios (GR), Odense (DK), Scheldt (BE), Shannon

(IE), and Tevere (IT).

Key points raised from the answers related to testing and during the workshop

KEY ISSUES FOR THE IDENTIFICATION OF GROUNDWATER BODIES

The specific guidance related to bodies of groundwater focus on similar main criteria used for surface water bodies, highlighting that the delineation must ensure that the relevant objectives of WFD can be achieved. This delineation must enable an appropriate description of the quantitative and chemical status of groundwater.

A more detailed annex related to technical issues developed during the Workshop on Groundwater Characterization held on 13th October 2003 in Brussels presents all the scope of issues covering this theme. As a first step, four specific issues can be underlined:

- the size of bodies,
- what are "significant flows" and "significant quantities"
- the very small bodies
- the international bodies.

THE SIZE OF GROUNDWATER BODIES

Most of PRBs undertook the delineation on the basis of existing aquifer maps or previous studies. They considered geological boundaries, other hydraulic boundaries as well as the chemical status when necessary. The guidance specifying that the degree of subdivision must be adapted the particular characteristics of their RBD, the size of groundwater bodies retained are covering a very large scope; In the Odense or Oulujoki PRBs, the medium size is about some km2 whereas in Jucar and in Mosel PRBs, this size is about some hundreds km2. Some PRBs would like **to receive some more guidance about a reasonable (if not ideal) scale** of groundwater bodies. This could also be more precise about small groundwater bodies.

WHAT ARE "SIGNIFICANT FLOW" AND "SIGNIFICANT QUANTITIES OF GROUNDWATER"?

The guidance document is answering precisely to the second question: a significant quantity of abstraction is 10 m3 a day as an average. But, one PRBs answer (Odense PRB) is pointing on an ambiguity related to groundwater not used for producing drinking water. A large scope of answers to the question of significant flow can be seen: from one considering that this is closely linked to the limit of 10 m3 a day to another one estimating that 250 m3 a day is an adequate limit.

THE VERY SMALL BODIES

This issue is not really considered as a real one at this stage of the delineation. Generally, pragmatic solutions are used such as those developed on Shannon PRB.

INTERNATIONAL BODIES?

This issue appeared in the related PRBs such as Mosel-Saar and Neisse. For this last PRB, the national boundaries are considered as a criteria for separating water bodies whereas in Mosel-Saar, we can find transboundary bodies of groundwater. This issue could be developed with close links to the legal aspects of responsibility of Member States in the implementation of WFD when International Commission is not considered as a competent authority.(*This transboundary issue for bodies of groundwater is also an issue for surface water bodies).*

KEY ISSUES FOR THE TESTING OF "TOOLS ON ASSESSMENT AND CLASSIFICATION OF GROUNDWATER"

The following key issues have been identified by the PRBs that responded to the questionnaire:

UNDERSTANDING OF THE TOOLS

- At this stage, the statistical methods proposed in the technical report of the WG 2.8 are not tested (Oulujoky PRB), being considered too complicated and difficult to use.
- The groundwater directive orientations are considered to be generally understandable (Odense PRB), although it would benefit from more illustrative examples. The choice of the arithmetic mean rather than the median has been questioned.
- The accompanying software GwStat is difficult to use with respect to converting data from other tools (e.g. Excel95) for calculating the representativity index and status, and other tools were used e.g. by the Odense PRB (MapInfo and Excel). GwStat could be used for studying trends.
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SPATIAL REPRESENTATIVITY OF MONITORING SITES

- Efforts for upgrading the groundwater level network in the Júcar PRB will enable to improve the assessment of the quantitative status of groundwater bodies, which represent one of the key issues of groundwater management within the WFD. This involves the establishment of new piezometers (measurement stations) and the full use of historical data.
- Waterworks in the Oulujoky PRB are focusing on monitoring groundwater quality especially in areas without any risk activities. Monitoring in the PRB will hence focus on two waterworks and one national monitoring station.
- The Odense PRB monitoring network will not be able to fulfil the requirements of the technical report of WG 2.8 with respect to the reprentativity index (0.56 in comparison to 0.80 required under the WG 2.8 report).

QUALITY DATA

- The monitoring of groundwater in the Oulujoky PRB (areas with low risks of pressures) is not adequate for a proper assessment of groundwater chemical status.
- On the basis of the status description of the individual groundwater bodies, data availability and coverage are considered appropriate in the Odense PRB for the description of groundwater status, which is not the conclusion reached when using the representativity index for each groundwater body. This is due to the placement of some boreholes which does not represent an ideal monitoring network. The removal of some wells would enable to comply with the requirement of a representativity index of 0.8 at the expense, however, of a far lower data coverage.
- The use of the quantification limit (LOQ) as stipulated in the GWD proposal may represent a difficulty for historical data for which it was not reported (instead a value of 0 was given).

TIME SERIES

Monitoring by waterworks in the Oulujoky PRB would allow establishing trends for parameters such as nitrates, chloride, ammonia and conductivity but not for other parameters.

- In the Odense PRB, insufficient data collection would hamper a clear identification of trends. The GWD proposal does not describe how to deal with fragmented or temporally limited time series. The only attempt of trend study could focus on nitrates and chloride.

Another problem noted in the Odense PRB is linked to the use of an average for the whole groundwater body and not to look for time series at individual locations. This aspect will be further discussed in the light of the negotiation process of the Commission proposal of groundwater directive