

TIDAL WATERS STRATEGIC REVIEW: THE STATUS OF TIDAL WATER OPERATIONAL ACTIVITY WITHIN THE ENVIRONMENT AGENCY



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6. REFERENCES

Marine Pollution Monitoring Management Group, 2001/16; MPMMG Strategy Document for the Development of a Comprehensive and Coherent Monitoring Network in the UK, Draft Report

- Appendix 1 The "What Goes on in the Coastal Zone" questionnaire.
- Appendix 2 Communication Diagrams for Each Region and National Centre/Service Based on Questionnaire Returns
- Appendix 3 Listing of the Various Internal and External Working Groups and Organisations With Tidal Water Interests and Which Have Agency Involvement
- Appendix 4 National Resource Estimates for Environment Agency Tidal Water Activities in 2001/02
- Appendix 5 Summaries of Regional Tidal Water Work Produced by NMS Customer Group.
- Appendix 6 Classification of Monitoring
- Appendix 7 Dangerous Substances Directive Monitoring Sites in Tidal Waters
- Appendix 8 NMS Customer Group Strategy for Coastal Sensitive Area Assessment, Candidate and Existing Sensitive Area Site Names by Region
- Appendix 9 Strategic Environmental Assessment Directive; Summary of Implications
- Appendix 10 Biodiversity Action Plans: Habitats and Species
- Appendix 11 Shellfish Waters Directive; Current Monitoring Sites
- Appendix 12 National Marine Monitoring Programme Sites
- Appendix 13 OSPAR Action Plan
- Appendix 14 Regional Water Quality Sampling Programmes Including Primary and Embedded Samples.

EXECUTIVE SUMMARY

The Tidal Waters Strategic Review is the largest and most comprehensive review of the Environment Agency's tidal water programmes ever undertaken. It arose in response to concerns over the diffuse and fragmented nature of the Agency's tidal water activities which have been voiced in several quarters both internally and externally and also to address the new patterns of working which will be required to fulfil the Agency's Vision and Frameworks for Change.

The Review is a high level assessment of the current status of tidal water activities within the Agency which has three principal outputs:-

- Identification of individuals and groups with tidal water responsibilities across all functions
- First order assessment of the resources committed to current tidal water activities
- A definitive analysis of the business drivers that require tidal water activity within the organisation.

CONCLUSIONS

The total investment by the Agency in tidal water activities is in the order of £5M per annum, making it by far the biggest single participant in the assessment and management of estuarine and coastal waters in England and Wales.

Despite its status as a key operator in tidal waters there is no central focus for its activities in this area, with tidal water activities being diffused throughout all functions and a lack of communication is evident between Areas, Regions and Functions in this regard. This weakness in the organisation has been identified by several groups but has yet to be seriously addressed.

Because of this lack of focus, some elements of tidal water programmes have been created as adjuncts to freshwater programmes and are consequently not as technically and scientifically robust as they could be.

Looking cross-functionally at the organisation as a whole, there are differences apparent in the approaches adopted by Regions in the type and quantity of work that they undertake which are inexplicable at the level at which this review was performed.

RECOMMENDATIONS

Recommendation 2.1.1

Through the BRITE process the Agency should establish a focus for tidal water activities to improve co-ordination and integration across functions and Regions and to provide external interests with a clear point of contact inside the organisation.

Recommendation 2.1.2

To facilitate communication and integration a group similar to the NE Region Tidal Water review Group should be identified in each Region and organisational structure charts produced to indicate responsibilities for, for example, NMMP.

Recommendation 2.3

Where differences of approach, scale and method of delivery are identified in Regional Water Quality programmes between Regions these should be investigated with a view to improving consistency.

Recommendation 2.4.1

The reasons for the big variation in Water Quality sampling programmes between Regions should be investigated and best practice identified and applied across the whole organisation.

Recommendation 2.4.2

Biological programmes in Regions need to be assessed against the definitive list of drivers identified in Section 3 below and differences in emphasis and approach investigated and, if necessary, redressed.

Recommendation 2.4.3

Current arrangements for macroinvertebrate analysis should be examined for cost effectiveness and other options for the delivery of this work evaluated.

Recommendation 2.5

Regional use of small vessels should be reviewed to ensure best practice and cost effectiveness

Recommendation 3.4.1

Timetables for the Water Framework Directive are clearly stated to ensure developments in tidal waters meet the needs of the Directive.

The need for policy, strategic and technical development of the Directive is acknowledged and appropriately resourced to ensure appropriate development of WFD in tidal waters.

Recommendations 3.4.2

Consideration is given to a reduction in the frequency of environmental monitoring at some sites for the purposes of the Dangerous Substances Directive.

The guidance is reviewed to provide more prescriptive, technically sound and cost effective monitoring to ensure a consistent approach to the environmental monitoring in the future.

Recommendation 3.4.5

A clear strategy, methodology and monitoring programme is agreed for the Regions for 2002 – 2005 for the assessment of eutrophication in tidal waters to ensure a robust defensible approach to SA assessment.

Consideration is given to the inclusion of OSPAR requirements within the existing UWWTD monitoring programmes (see OSPAR below).

Recommendation 3.4.7

Data collected in 2000-01 is reviewed on a site by site basis and future monitoring requirements determined from this review. This review will allow the scale of the future programme to be determined. The review should also take into account results for the Shellfish Hygiene Directive.

Recommendation 3.4.8

A strategic overview of technical requirements for Habitat Directive in tidal waters, considered with the requirements of other statutory drivers or international obligations. Consideration should be given to the specialist skills needed within the Agency for the delivery of these projects.

Recommendation 3.4.10.1

The assessment needs and monitoring requirements for coastal waters for the Urban Waste Water and Nitrates Directive and OSPAR eutrophication strategy should be reviewed with a view to merging the monitoring requirements.

Recommendation: 3.4.10.2

The environmental monitoring programme for radioactive substances is compared to the environmental monitoring programme for dangerous substances and where overlap occurs consideration is given to merging the sampling activities since the same media are sampled using similar sampling methods.

Recommendation 3.4.16

All marine biological data collected as part of routine biological monitoring programmes should be held at a central location and periodically updated to allow early warnings of the occurrence and spread of non-native species.

1. INTRODUCTION

1.1 Background

Tidal water activities within the Environment Agency occur across all functions and in all Regions and Areas. Since 1998 a proportion of this activity has been delivered nationally by the National Marine Service (NMS) but the majority is organised and delivered within the Regions using in-house resources and bought in services.

The NMS was created to provide the Agency with services relating to tidal water activities – principally those requiring the use of Coastal Survey Vessels or equivalent craft. However, the Terms of Reference for the Service also included requirements to Quality Assure all tidal water activities and to optimise value for money by ensuring the most efficient method of survey is employed for all survey work across the full spectrum of Agency involvement in tidal waters.

This requirement to look at tidal water activities across all functions has been given extra impetus by feedback from Functional Priority Planning exercises and also from a review carried out in 1999 by Internal Audit which flagged a number of issues warranting further investigation. Other work undertaken by Julia Barratt for the Water Management and the Water Management Heads of Function has highlighted the lack of networking and co-ordination of activity in the coastal zone. This is recognised as an issue that may well be resulting in lost opportunities to share lessons learnt and to apply best practice.

More recently a recommendation from the EU Ministers regarding Integrated Coastal Zone Management and the Agency's own Vision and the frameworks for achieving it identify the need to review the way we work and make appropriate changes. Amongst other things these include:-

- the overall role of the Agency in tidal waters and the structures in place to deliver this;
- the identification and quantification of future requirements for tidal water work and the impact that this will have on the organisation;
- the effective use of resources including Coastal Survey Vessels, Rigid Inflatable Boats and other small craft, and chartered vessels;
- Health and Safety considerations;
- Organisational processes for identifying what work goes is done Nationally and what is delivered Regionally.

In focusing on these issues, problems are evident in relation to medium to long term planning for the Agency's tidal water activities stemming, in large part, from:-

- a) A lack of knowledge and understanding of the Agency's total commitment to tidal water activities and the baseline of resources which are dedicated to this,
- b) the lack of a cross-functional overview of the totality of policy guidance for the Agency's tidal water activities, and
- c) the appearance on the horizon of new requirements (eg Water Framework Directive, Habitats Directive, estuarine classification, OSPARCOM etc) which have yet to be fully defined and quantified.

Consequently a pressing need was identified to establish baselines for the total tidal water activity of the Agency and of the resources that are consumed in delivering this. A key point

here is that the resolution of operational issues and the development, interpretation and implementation of policy must be addressed in parallel. To this end the Strategic Tidal Waters Review Project was initiated which drew on the existing infrastructure of the National Marine Service and its Client Board and Customer Group.

1.2 The Tidal Water Strategic Review Project

1.2.1 Project initiation and objectives

Following discussion with Heads of Function and Directors, the Tidal Waters Strategic Review Project was initiated in early 2001 with a remit to undertake a high level review of the Agency's current tidal water activities. The objectives of this study were:-

1. To provide a first order assessment of the resources committed to tidal water activities across all functions.
2. To identify all of the current and foreseeable business drivers which require tidal water activity within the Agency.
3. To assess organisational arrangements and current levels of activity in tidal waters across all regions and functions.

Great emphasis was placed on the fact that this project was seeking to establish baselines that could be used in the future to facilitate strategy development and longer term business planning processes. The aim of the project itself was not to initiate organisational change or make recommendations for organisational change.

1.2.2 Project Management Structure and Resourcing

Project Executive: Tony Owen (Area Manager, North Wessex)

Project Board: Martin Griffiths (Water Quality Head of Function)
Alistair Ferguson (Environmental Strategy)
Mick Pearson (Environmental Protection)
Charlie Pattinson (Environmental Protection)
Julia Barratt (Water Management)
Binnie Buckley (Operations)
Clive Gaskell (Water Quality and NMS Customer Group)

Project Manager: John Orr (NMS Manager)

Project Officers: Alison Miles (Marine Biologist, NMS)
Roger Proudfoot (Quality Assurance Team Leader, NMS)

Unfortunately, attempts to involve non-NMS staff in the Project Officer role were unsuccessful as no suitable staff were available for assignment to the project and consequently the additional workload was picked up by NMS staff facilitated by back filling of a temporary post to relieve strain on those directly involved.

In total 80 man days of staff time within NMS were devoted to the project.

2. CURRENT SITUATION

2.1 Organisational Structures and Communications

2.1.1 The Approach

The initial phase of work on this topic concentrated on the identification of groups and individuals involved in tidal waters work within the organisation. Because the aim of this review was to look at the operational delivery of the Agency's tidal waters programmes, the organisation and resource requirements of Head Office policy functions was not included — except where this has a direct bearing on operational delivery. Various Head Office personnel were, of course, consulted in the development of this review. Also, due to time and resource constraints attention has been focused on major areas of activity and for this reason Midlands Region has largely been excluded from the data gathering exercise and analysis. The Region does have tidal water responsibilities in the upper tidal reaches of the Humber and Severn systems but these are very small in the overall scheme of things.

At an early stage synergies were identified with a Water Management initiative looking at the integration of management in the coastal zone and the data gathering aspects of both pieces of work were combined. This resulted in the preparation and distribution of a questionnaire (Appendix 1) that sought to identify existing management structures and pockets of tidal water activity in Regions and National Centres/Services.

This questionnaire was supplemented by a trawl of the Agency Intranet for additional information and was followed up with e-mails and phone calls to extract additional information and to identify other individuals to involve in the process.

2.1.2 Results

Over 100 questionnaires were completed and returned to the Project team. From the returns received communication diagrams were collated for each Region (Appendix 2) and a database of tidal waters contacts has been developed.

From the information received matrices were produced which illustrate how the groups and individuals identified interact Functionally and Regionally (Tables 1 and 2). Details of the various groups represented by the headings in these tables are presented in Appendix 3.

It is important that the following limitations of the questionnaire analysis are noted:

- i) The exercise was designed as a high level sweep across the organisation and therefore paints a picture which knowingly understates the extent of involvement and interaction.
- ii) Although all Regions and Areas have contributed Head Office and Midlands Region were omitted from the data collection for reasons outlined above. In addition, only the National Centres and Services listed were asked for returns.
- iii) Many of the questionnaires were cascaded from the original recipients to others. It is estimated that only 60% of the responses anticipated have been received.
- iv) It is acknowledged that not all of the groups and individuals that are involved in tidal waters have been contacted. This is simply due to the complexity of the organisation, which has made it impossible to collate a completely exhaustive database of contacts.

TABLE 1 - Agency Involvement with Tidal Water Activities by Function

	FLOOD DEFENCE	FLOOD RISK	WATER	CUSTOMER SERVICES	WATER
Strategic Planning	●	●	●	•	•
Flood Warning	●	●			●
Flood Defence Schemes	●	●	●	•	
Surveys	●	●	●		•
External Consultations	●	●	●	●	●
Planning Applications	●	●	●	●	•
Land Drainage Consents	●	●	●	●	
Discharge Consents		●	●	•	
Abstraction Licences		●	•	•	●
Monitoring	●	●	●		
Reactive Monitoring	●	●	●		
Enforcement	●	●	●		•
Incident Response	●	●	●		
Navigation/Harbour Duties		●	•		
Boat Operations		●	●		
Data Review	●	●	●		•
Modelling/Model Validation	●	●	●		•
Research and Development Projects	●	●	●		•
EA Sections					
Flood Defence	●	●	●		•
Fisheries	•	●	●		
Recreation & Navigation	●	●	•		
Conservation	●	●	●		•
Ecology	•	●	●		
Environmental Impact Assessment	●	●	●		•
Radioactive Substances Regulation	•	•	•		
Water Quality	●	●	●		•
Process Industries Regulation		●	●		•
Waste Management & Regulation	●	•	●		
Water Resources	•	●	•		●
National Centres	●	●	●		
National Services	•	●	●		
National Technical Groups	●	●	●		
Local Environment Agency Plans	●	●	●	●	●
Land Use Planning and Development Control	●	●	•	●	•
Shoreline Management	●	●	•	•	•
Government Organisations	●	●	●	●	●
Local Government	●	●	●	●	•
European Union	•	●	●	•	
Research	•	●	●	•	•
Teams Involving External Groups	●	●	●	●	●
Teams Involving Outside Representatives	●	●	●	●	●
Port Authorities	•	●	●	•	•
Industry Facing Groups	●	●	●	●	
Charitable Organisations	●	●	●	●	●

● = Major Role
• = Minor Role

TABLE 2 - Agency Involvement with Tidal Waters Activities by Region

	NE	ANGIAN	THAMES	SOUTHERN	SW	WALLS	NW
Strategic Planning	●	●	●	●	●	●	●
Flood Warning	●	●		●	●		●
Flood Defence Schemes	●	●	●	●	●	●	●
Surveys	●	●	●	●	●	●	●
External Consultations	●	●	●	●	●	●	●
Planning Applications	●	●	●	●	●	●	●
Land Drainage Consents	●	●	●	●	●	●	●
Discharge Consents	●	●	●	●	●	●	●
Abstraction Licences	●	●	●	●	●	●	●
Monitoring	●	●	●	●	●	●	●
Reactive Monitoring	●	●	●	●	●	●	●
Enforcement	●	●	●	●	●	●	●
Incident Response	●	●	●	●	●	●	●
Navigation/Harbour Duties	●	●		●	●	●	●
Boat Operations	●	●	●	●	●	●	●
Data Review	●	●	●	●	●	●	●
Modelling/Model Validation	●	●		●	●	●	●
Research and Development Projects	●	●	●	●	●	●	●
EA Sections							
Flood Defence	●	●	●	●	●	●	●
Fisheries	●	●	●	●	●	●	●
Recreation & Navigation	●	●	●	●	●	●	●
Conservation	●	●	●	●	●	●	●
Ecology	●	●	●	●	●	●	●
Environmental Impact Assessment	●	●	●	●	●	●	●
Radioactive Substances Regulation	●	●	●	●	●	●	●
Water Quality	●	●	●	●	●	●	●
Process Industries Regulation	●	●	●	●	●	●	●
Waste Management & Regulation	●	●	●	●	●	●	●
Water Resources	●	●	●	●	●	●	●
National Centres	●	●	●	●	●	●	●
National Services	●	●	●	●	●	●	●
National Technical Groups	●	●	●	●	●	●	●
Local Environment Agency Plans	●	●	●	●	●	●	●
Land Use Planning and Development Control	●	●	●	●	●	●	●
Shoreline Management	●	●	●	●	●	●	●
Government Organisations	●	●	●	●	●	●	●
Local Government	●	●	●	●	●	●	●
European Union	●	●	●	●	●	●	●
Research	●	●	●	●	●	●	●
Teams Involving External Groups	●	●	●	●	●	●	●
Teams Involving Outside Representatives	●	●	●	●	●	●	●
Port Authorities	●	●	●	●	●	●	●
Industry Facing Groups	●	●	●	●	●	●	●
Charitable Organisations	●	●	●	●	●	●	●

(no.) = Number of Groups/Sections involved with

● = Major Role

● = Minor Role

2.1.3 Conclusions from the data gathering exercise

- A large number of individuals are involved in tidal waters.
- There are a huge number of groups (internal and external) involved in tidal waters and an obvious lack of awareness of what groups exist, who sits on them and what their remits are.
- In the majority of cases tidal water activities are nested within groups and individuals who have much broader responsibilities e.g. EP teams covering all aquatic environments and waste disposal activities; Fisheries teams primarily concerned with freshwater activities; Flood Defence teams with fluvial and coastal responsibilities etc. Consequently tidal water activity is diffused throughout organisational structures. This factor coupled with wide variation in Regional structures makes the task of reaching all relevant groups and individuals very difficult.
- It was clear from the outcome of the exercise that there are significant gaps in communication between Regions, and even Areas, in terms of tidal water activities. Contact between functions varies from Region to Region and some Functions/Areas are not aware of what other teams are doing.
- The same activity may be undertaken by different functions in different Regions (or even Areas) e.g. Bathing Water sampling may be an EP or FER activity and marine biological and water quality activities are partitioned between EP and FER Departments in a variety of ways. This makes the quantification of effort expended on a particular activity very difficult to assess and is a particular problem for the management of large national programmes e.g. the National Marine Monitoring Plan (NMMP) where three functions, seven regions, two National Centres and two National Services are involved.
- The only "joined up" approach to tidal water monitoring identified in this survey was that operated by NE region through their Tidal Water Review Group and even here not all functions were represented. Nevertheless, the existence of a Tidal Waters Review Group in NE Region should be highlighted as an example of Best Practice.

Recommendation 2.1.1

Through the BRITE process the Agency should establish a focus for tidal water activities to improve co-ordination and integration across functions and Regions and to provide external interests with a clear point of contact inside the organisation.

Recommendation 2.1.2

To facilitate communication and integration a group similar to the NE Region Tidal Water review Group should be identified in each Region and organisational structure charts produced to indicate responsibilities for, for example, NMMP.

2.2 Current Activities and Resources

2.2.1 The Approach

Information on activities and activity levels was gathered through follow up to the questionnaire exercise using e-mail and telephone communications, supplemented by recourse to existing information sources – databases, business plans and other pre-existing data. To produce an exhaustive collation of all activity levels would have been a major undertaking that was outside the remit of the project. Consequently the identification of activities and quantification of activity levels presented below should be regarded as a first approximation which knowingly underestimates the true situation in the organisation. In particular, whilst respondents were generally willing to discuss the activities they were engaged in, there was, commonly, a reluctance to provide quantitative information in terms of Full Time Equivalents (FTEs) and/or costs. Consequently assumptions have been made in the generation of quanta which are made explicit wherever possible in the following information.

2.2.2 National Perspective

A high level summary of the resources (as £k) attached to tidal water work in 2001/02 is shown in Appendix 4 and is summarised in Table 3.

TABLE 3 - TOTAL COST OF AGENCY TIDAL WATER ACTIVITIES IN 2001/02

ACTIVITY	TOTAL ANNUAL COST (£K)
Titanium Dioxide Directive	44
Dangerous Substances Directive	420
Urban Waste Water and Nitrates Directive (Designated Sensitive Areas)	52
Urban Waste Water and Nitrates Directive (Candidate Sensitive Areas)	350
Shellfish Waters Directive	220
Chloro-alkali Directive	3
Habitats Directive	1108
Bathing Waters Directive	370
Water Framework Directive (R & D)	160
OSPAR Convention	-
OSPAR Convention (Radioactive Substances)	200
National Marine Monitoring Plan	389
Nuisance Marine Algae	10
NWC Estuary Classification	-
Biodiversity Action Plans	-
Catchment Abstraction Management Strategy	-
Shoreline Management Plans and Flood Defence	495
Coastal habitat Management Plans	-
Local Environment Action Plans	-
Eutrophication Control Action Plans	-
Non-native Species Review	-
Fisheries enforcement	194

Support to Navigation and harbour Operations	
Operational monitoring	307
TOTAL	4321

These figures are known to be incomplete and are best estimates for the direct expenditure on the various programmes listed in the Table (the methods of computation are shown in Appendix 4). For example, the Shoreline Management and Flood Defence figure is for Anglian Region only as data for other Regions are not available. Also, indirect costs have not been included except for work undertaken by NMS e.g. accommodation oncosts, vessel and equipment maintenance and depreciation etc. Consequently the true total cost is likely to be significantly in excess of £5M.

At the behest of the UK Government, the Marine Pollution Monitoring Management Group (MPMMG) is conducting a review of the marine monitoring undertaken by all relevant statutory bodies with a view to "develop a comprehensive and coherent monitoring network in the UK". This review, which is still in its early stages, has identified 24 separate principal pollution monitoring programmes which ensure compliance against 13 EU Directives. These programmes are managed by six Agencies:

- Environment Agency (EA)
- Environment Heritage Service Northern Ireland(EHS)
- Department of Agriculture and Rural Development for Northern Ireland (DARDNI)
- Scottish Environment Protection Agency
- Centre for Environment, Fisheries and Aquaculture Science
- Fisheries Research Services (FRS)

The total cost of these compliance monitoring programmes in the UK is estimated at £4.6M, of which the Environment Agency contributes just under half at £2.04M.

Looking more broadly at environmental monitoring for all purposes, the list of contributors expands to include the Joint Nature Conservation Committee (JNCC) and the Countryside Agencies, the Alistair Hardy Foundation for Ocean Science (SAHFOS) and a number of other organisations with smaller involvement. On this basis the total cost of monitoring has been estimated as in excess of £10M with the Environment Agency's contribution probably being in excess of £5M.

It is clear from these figures that the Environment Agency is a very major player in coastal waters, spending as much in this area as all of the other organisations combined. It is noteworthy that this situation is probably not the perception of most Agency staff and is certainly not recognised externally.

2.3 Regional Overviews

Summaries of the key tidal water activities in each Region have been compiled by NMS Customer Group representatives and are presented in Appendix 5. In general, all Regions undertake a similar range of activities but the quanta vary widely and the reasons for this are often not apparent. Where practicable to do so, the functional breakdown of tidal water work has been collated by Region (see Functional Overviews below) and these data show the scale of variation between the programmes operated by different Regions.

As well as differences in the composition and scale of Regional programmes there are also big differences in the way the programmes are delivered and in the degree of involvement by NMS. So for example, for EA Wales, Northeast and Southern Regions, National Marine Service undertakes the bulk of the Water Quality programmes whereas in Southwest the programme is delivered almost exclusively by Regional teams. The National Marine Service is not currently involved with delivery of programmes in functions other than Water Quality and Biology.

Southern Region and EA Wales are the only Regions with duties relating to port operations (Rye Harbour) and Conservancy (Dee estuary).

Because, in most cases, tidal water programme delivery is a component of broader duties of Area and Regional teams it has not been possible within the scope of this review to quantify resource utilisation. However, efforts have been made to identify the survey craft owned and operated by the regions.

Recommendation 2.3

Where differences of approach, scale and method of delivery are identified between Regions these should be investigated with a view to improving consistency and adopting best practice.

2.4 Functional overviews

2.4.1 Water Quality

Of all the tidal water programmes currently being delivered by Regions, the best defined are the Water Quality programmes. Work undertaken over the past two years to review Operational Monitoring and to Classify monitoring purposes has resulted in the creation of a Water Quality Monitoring Database which is managed and maintained by Environmental Strategy. The tidal water elements of this database have been extracted and are summarised in Figure 1, which shows the distribution of sampling effort (as number of sites sampled) by the Primary Purpose of the samples for each Region (see Appendix 14 for abbreviations). Figure 2 shows the same data classified using the IUNO scheme. With the proviso that the data populating the database are only as good as the regional returns that were used to compile it and these have not been Quality Assured by the Review Team, this analysis gives a fair representation of sampling effort.

It is apparent from Figure 1 that there are big differences between Regions in the size of their tidal water programmes that are inexplicable without a significant amount of further work.

A similar analysis of primary and embedded sampling is presented in Appendix 14. This presentation of the data does not reflect so well the sampling effort as embedded samples are collected concurrently with primary purpose samples but it does provide a better estimator of analytical effort.

Figure 1. Water Quality Database - Sampling Effort by Driver

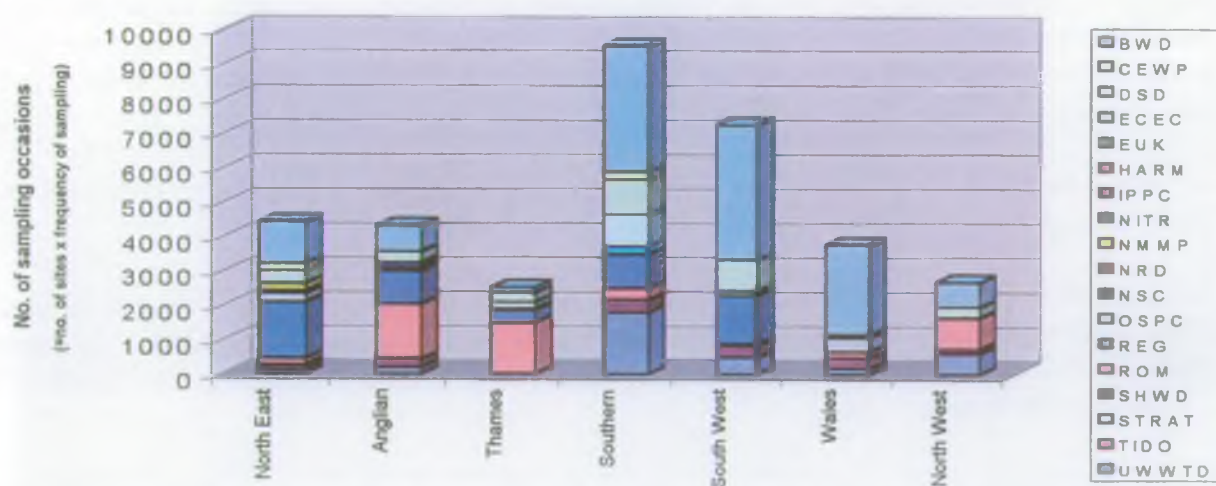
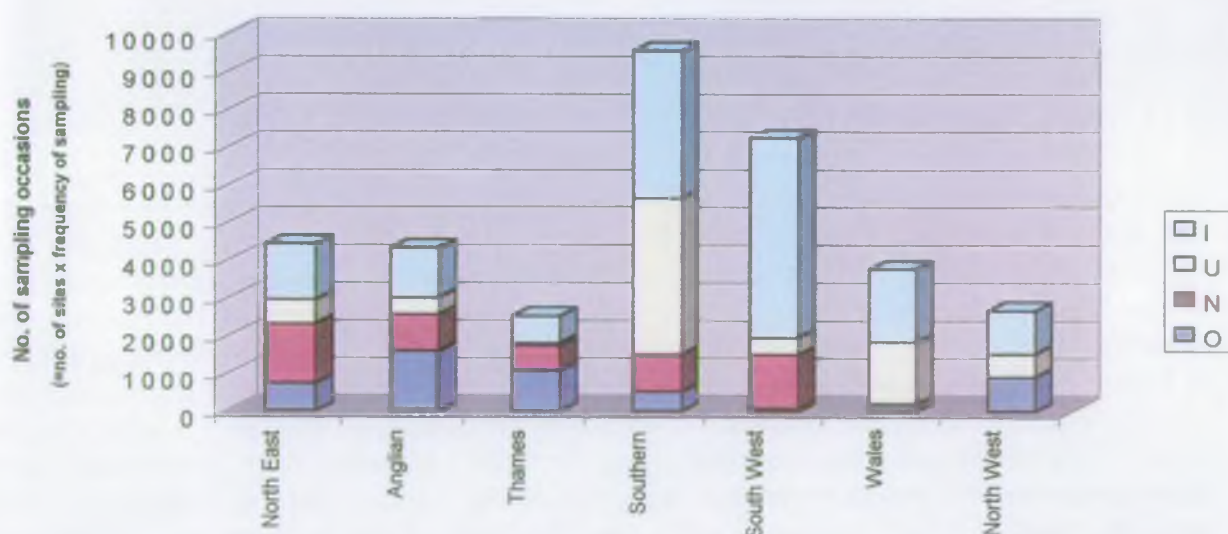


Figure 2. Water Quality Database - Sampling Effort by IUNO Classification



Recommendation 2.4.1

The reasons for the big variation in sample programmes between Regions should be investigated and best practice identified and applied across the whole organisation.

2.4.2 PIR/RSR

A small amount of work is undertaken for PIR looking at the distribution of contaminants of concern from specific processes in water, sediment and biological samples. This work could not be quantified within the scope of this study.

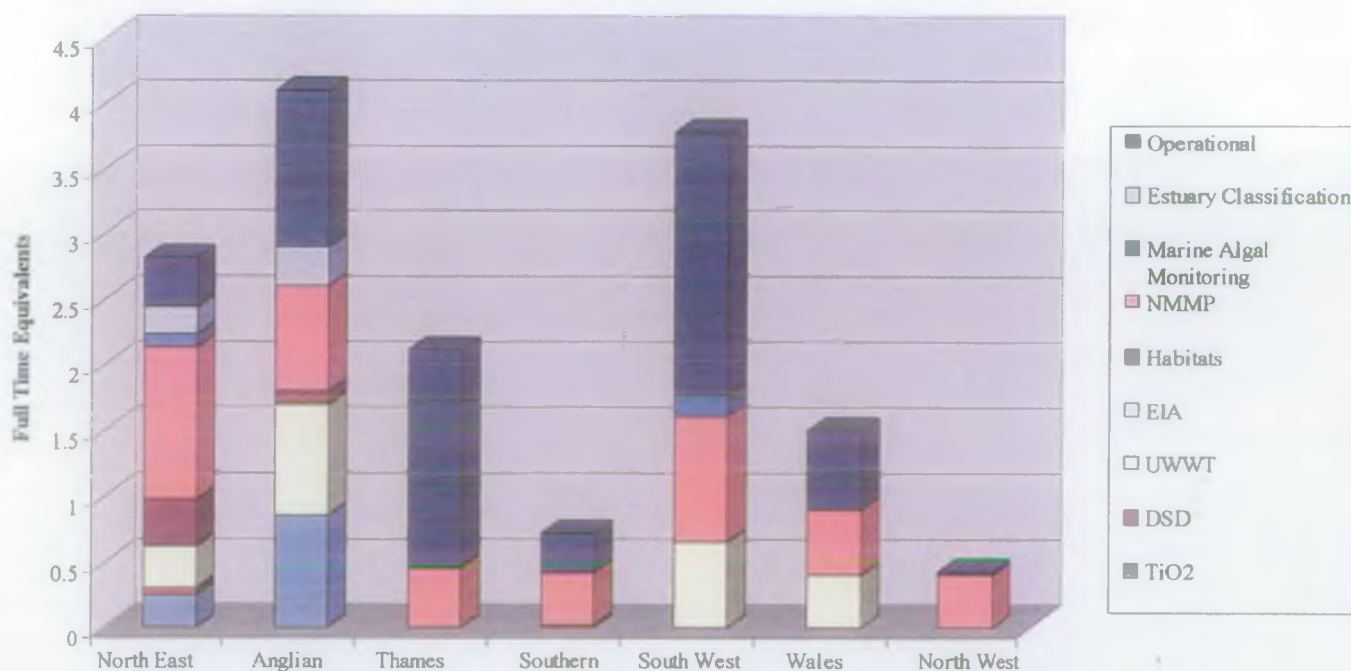
The RSR function commissions independent monitoring of authorised discharges of radionuclides to the environment and conducts a comprehensive monitoring programme of radioactivity in the environment resulting from authorised discharges. Approximately two thirds of the environmental monitoring occurs in the marine environment particularly focusing on nuclear plants such as the BNFL Sellafield site. Biota, sediment and water samples are collected for radionuclide analyses and reported annually. This work is currently contracted out by the National Compliance Assessment Centre (NCAS) at an annual cost of some £200k.

2.4.3 Biology

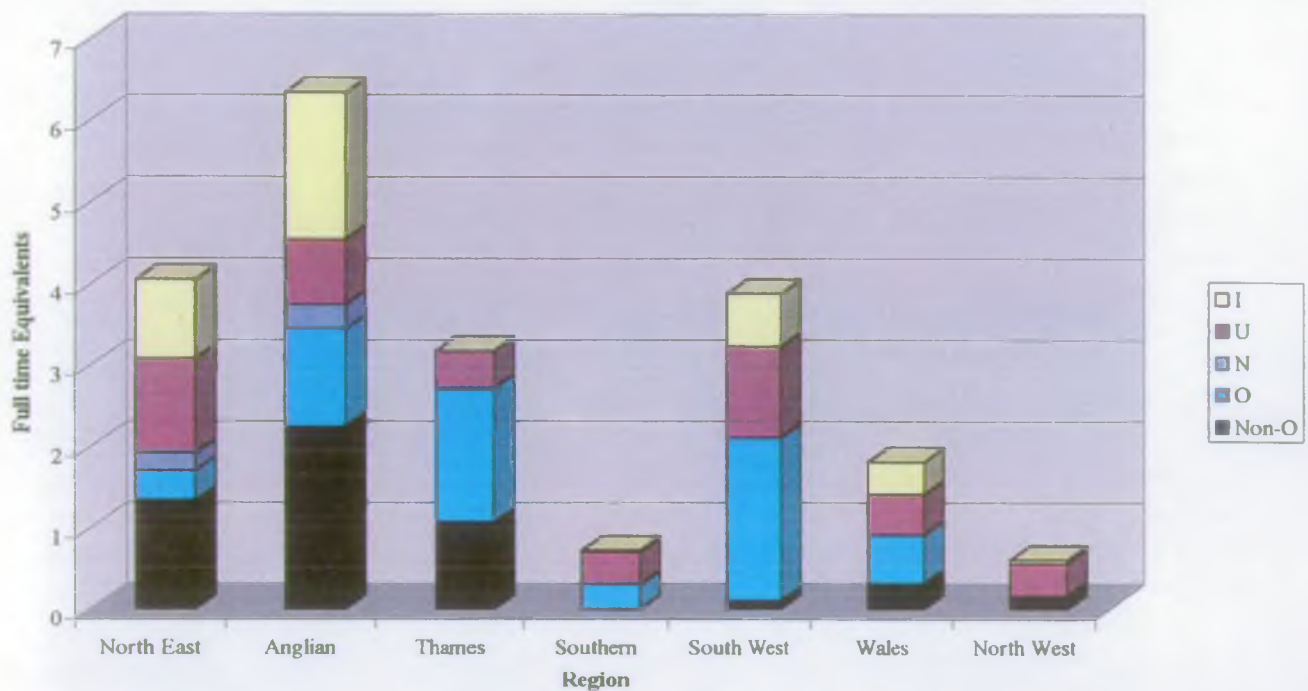
The range of biological activities going on in tidal waters is illustrated in Figures 3 and 4. There appears to be very significant differences in the effort put into tidal water biology by the Regions with an order of magnitude difference between the biggest and smallest programmes. In most Regions the biggest single element of biological work is Operational

monitoring with the National Marine Monitoring Programme running a close second. Titanium Dioxide Directive work is significant in Anglian and Northeast Regions (the only two with Titanium Dioxide plants) but otherwise all of the remaining activities are very minor in terms of their scale.

Marine Biology Priority Planning by Driver



Marine Biology Priority Planning by IUNO Classification



The Biology Priority Planning exercises carried out in 2000 and 2001 identified a total of 18 FTEs of effort dedicated to tidal waters biology within the Water Management function and the breakdown of this effort by Region and driver are shown in Figures 3 and 4. The overall level of effort on tidal waters biology is very small (18FTE) and it is interesting to contrast this with the effort dedicated to freshwater work (>100 FTE). The comparison is a stark one and is probably a consequence of historical practices and the existence of a clear national requirement for freshwater biology within the General Quality Assessment scheme for rivers.

However, there is an additional, *albeit* small, resource in Environment Protection (EP) dedicated to marine biological work which is not identified in the biology Priority Planning data nor is it identified separately within the EP exercise. Consequently the data presented here knowingly underestimate the Agency's tidal water biology resources. On the 18 FTE identified some 11.5 FTE are utilised in benthic macroinvertebrate studies and at least half of this effort comprises external contracts for the processing of macrobenthic samples. This process is currently handled on a regional basis with a variety of contractors being used to analyse and quality assure these samples. The effort expended on these analyses could probably be reduced by better co-ordination and cross regional management.

Recommendation 2.4.2

Biological programmes in Regions need to be assessed against the definitive list of drivers identified in Section 3 below and differences in emphasis and approach investigated and, if necessary, redressed.

Recommendation 2.4.3

Current arrangements for macroinvertebrate analysis should be examined for cost effectiveness and other options for the delivery of this work evaluated.

2.4.4 Conservation

Traditionally, the Conservation function has been involved in activities associated with coastal habitat management and with Impact Assessment work for Coastal Defence schemes from the landward side. Much of this work is contracted out by Flood Defence to environmental and engineering Consultancies. Involvement of the function below the low water mark was uncommon.

However, with the introduction of the Habitats Directive and the creation of candidate Special Areas of Conservation (cSACs) covering sub-tidal areas, this situation has changed (see Section 3.4.8 below). Whilst the Agency is under an obligation to undertake additional monitoring for establishing the conservation status of the interest features of a site a number of investigational projects have been initiated which are driven by the Habitats Directive. Details of the projects which are being undertaken in 2001/2 are shown in Table 4. Whilst Conservation is the primary function with regard to Habitats Directive implementation within the Agency, much of the work on this issue is undertaken outside the function e.g. by Water Quality and Biology staff.

In addition, the Agency will support EN and CCW in monitoring and the Agency will align its monitoring, where possible within the restrictions of its monitoring programme, to help assess site conditions.

Table 4 - Habitats Directive research projects, involving tidal waters, proceeding in 2001/02

Region	Project Title	Estimated Cost (K)
North East	Tees Estuary Investigations	49.8
	Effects of nutrient enrichment on the integrity of Lindisfarne SPA and the role of the Agency authorised process	17.4
	Maintenance and development of existing estuary modelling systems in NE Region - Humber	12.1
Southern	Impact of effluents on the Solent Maritime European Site	263-494 (until 2003)
	Multi-functional investigation of potential impacts on the Solent and Isle of Wight Lagoons	65
South West	Modelling of dispersion of TBT on Fal estuary and impact of the discharges of TBT from Falmouth Dock on the Fal Estuary	25
North West	Baseline biological survey of Mersey estuary	30
	Review of available data on the Ribble and Alt SPA	20
	Tidal modelling of the River Kent Estuary	?150

Other marine projects have been proposed but are either still being scoped or reviewed for example the National Assembly of Wales have only just confirmed the Habitats Directive funding for EA Wales.

2.4.5 Fisheries

Enforcement activities are undertaken using a range of marine craft. There would appear to be some potential in combining water quality work with enforcement activity where areas and sites of activity overlap. However, combining the activities of fisheries enforcement and tidal waters sampling programmes is difficult due to the very different nature of the two types of work. Enforcement staff need to be available for call outs which can be compromised if sampling activity is undertaken on the same day, since 8 hours needs to have elapsed between finishing the sampling and being able to respond to a call out. In addition poachers would be able to predict more easily when patrols would be occurring.

2.4.6 Flood Defence and Shoreline Management

All Capital works and some maintenance works relating to Coastal Defences require Environmental Impact Assessments to be undertaken. Much of this work is contracted out to Engineering and Environmental Consultancy services.

A Shoreline Management Plan (SMP) aims to provide a vehicle for the long term, sustainable protection of our coastline.

English Nature and the Agency working together with stakeholders prepare CHaMPs. Seven pilot CHaMPs will be produced over the next two years. 50% of the funding is provided by the EU, the rest by the partners to the project.

2.4.7 Water Resources

There is currently no work undertaken in tidal waters for the Water Resources function. The development of Catchment Abstraction Management Plans (CAMS) may change this situation in the future.

2.5 Vessels used in the delivery of Regional Programmes

Details of the vessels owned and operated by each of the Regions are shown in Appendix 15 and summarised in Figure 5.

Average utilisation for Regionally operated vessels tends not to be very high at the equivalent of 27 days use per vessel. If the two permanently crewed vessels (Thames Champion and Northumbrian Rivers) are omitted from the calculation average utilisation is around 20 days per year. In general these figures seem low for utilisation of assets worth some £1.4M (based on original purchase price).

Recommendation 2.5

Regional use of small vessels should be reviewed to ensure best practice and cost effectiveness.

Figure 5. Number of Vessels Operated by Regions

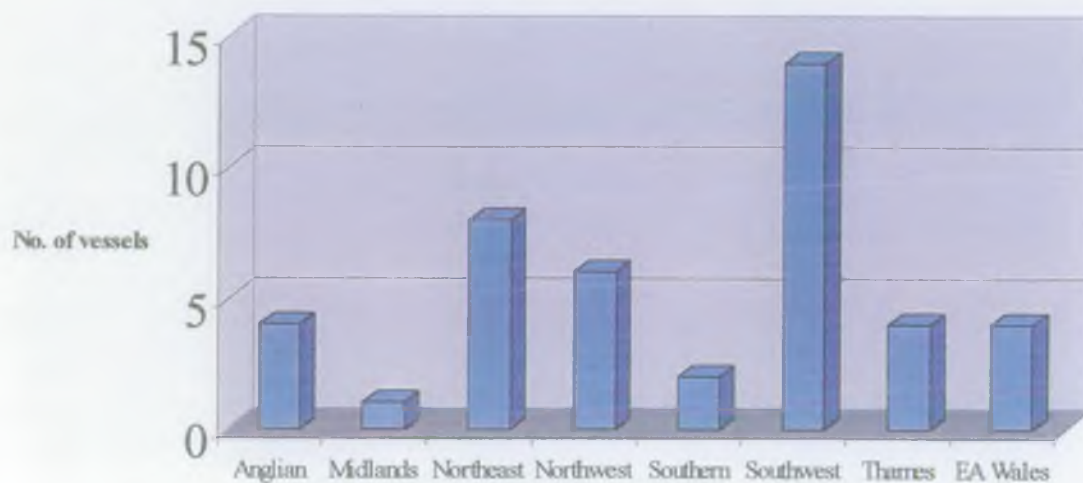
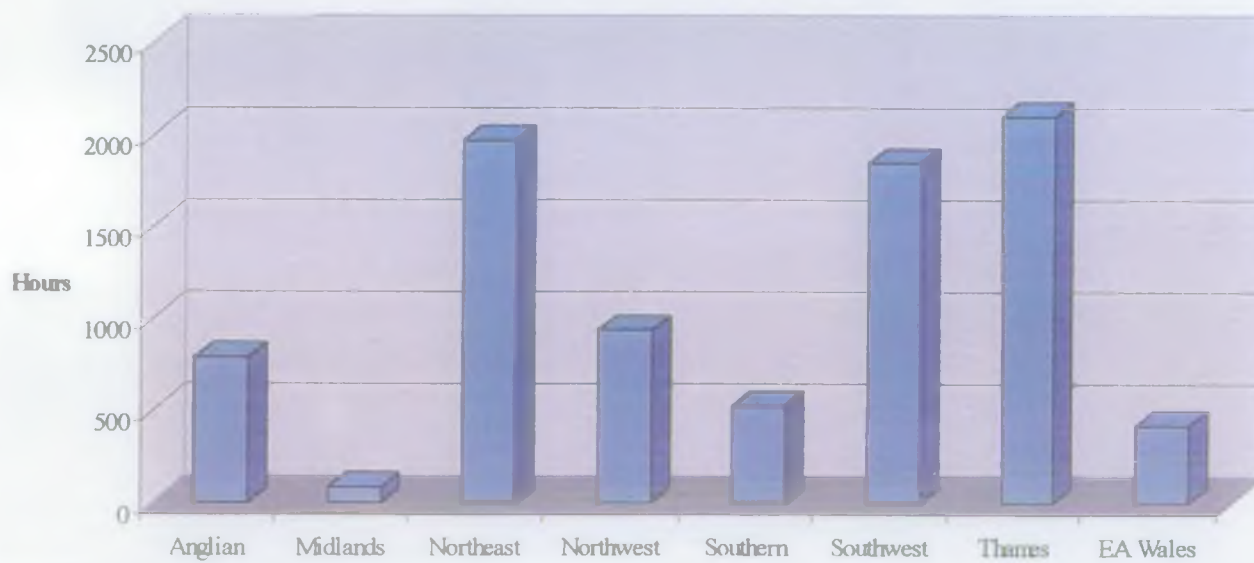


Table 6. Vessel Utilisation (hours)



3. BUSINESS DRIVERS

3.1 Introduction

The tidal waters activities outlined in the snapshot presented in section 2 are driven by a variety of International, National and local requirements. In many cases the tidal water element of these requirements arises as an adjunct to more broad based environmental duties of the Agency. Consequently, to arrive at an overall synthesis of the Agency's tidal water responsibilities it is necessary to extract and collate the tidal water elements from a wide variety of sources. This exercise has been undertaken and is presented here as a definitive list of business drivers that require activity in tidal waters by the Agency. Each of the drivers that have been identified are assessed in detail and, where possible, the implications for future trends in the amount of work needed are identified.

The Environmental Strategy Directorate are responsible for interpreting the drivers for tidal waters activities and the Operations Directorate responsible for delivering the requirements through two primary operational functions; Water Management and Environmental Protection.

Water Management

Water Management includes: Flood Defence; Fisheries; Ecology and Conservation; Water Resources and; Recreation and Navigation. Each sub- function has particular drivers which are identified in this review.

Environmental Protection

Environmental Protection includes Process Industries Regulation; Radioactive Substances; Water Quality; Land Quality and; Waste Management and Regulation. Land Quality and Waste Management and Regulation are not considered in this review.

3.2 Objectives

Identify all policies and drivers which lead to tidal water activity within the Agency.
Set policies and drivers into context with the Frameworks for Change.
Set out the theoretical programme, highlighting areas where national policy or guidance is incomplete.

3.3 Frameworks for Change

In reviewing the drivers, the Agency's frameworks for change have also been considered and specific drivers linked to the themes, outcomes and goals.

The Agency's environmental outcomes are to be assessed using a variety of sustainable development indicators and tests to ascertain the degree to which the desired environmental outcomes are being achieved. In most instances there are very few marine indicators.

In considering the frameworks for change the review only focused on those frameworks that pertain directly to tidal waters (estuaries and coast) which are namely:

Reducing Flood Risk
Limiting and Adapting to Climate Change
Wiser, Sustainable use of Natural Resources
Improved and Protected Inland and Coastal Waters
An Enhanced Environment for Wildlife

It is perceived that the following frameworks, whilst integral to environmental assessment and improvement, do not lead to tidal waters activities *per se*:

Restored, Protected Land with Healthier Soils
Cleaner Air for Everyone
A Better Quality of Life
A Greener Business World

Table 4a shows the identified drivers for tidal waters activities and links the relevant aspects of the frameworks for change with the drivers. For each of the frameworks identified above which lead to direct tidal waters activity the relevant environmental outcomes, goals and activities have been extracted and presented. The Classification of Monitoring Activities in the Aquatic Environment has also been used to classify the drivers (the full description of the classification is presented in Appendix 6) and a summary of requirements for each driver is provided in Table 4b.

The drivers are reviewed individually in more detail below.

3.4 Drivers for Tidal Waters Activities

3.4.1 Water Framework Directive 2000/60/EC

The Water Framework Directive introduces an integrated and co-ordinated approach to, and represents an important step forward for, water management in Europe. It rationalises and updates existing water legislation by setting common EU wide objectives for water.

It's key objectives, as set out in Article 1 are to:

- prevent further deterioration and protect and enhance the status of aquatic ecosystems and associated wetlands,
- promote sustainable water consumption, and
- contribute to mitigating the effects of floods and droughts.

The aim of the Directive is to take a holistic approach to water management, as water flows through a catchment from lakes, rivers and groundwaters towards estuaries and thence the sea. Surface and groundwater are to be considered together, in both qualitative and quantitative terms.

The overriding objective of the Directive, as set out in Article 4, is that Member States will be required to achieve "good surface water status" and "good groundwater status", and also to prevent deterioration in the quality of those waters, which are already "good". The major change of approach in this Directive is that ecological quality is a key means by which,

Table 4a - Summary of Business Drivers and Monitoring Requirements for Tidal Water

Driver	Customer	IUNO Class	Framework	Outcomes	Goals
Water Framework Directive	EU	I	Cross cuts all frameworks		
Dangerous Substances, Titanium Dioxide and Chlor-alkali Directives	EU	I	Improved and Protected Inland and Coastal Waters	1. Abstractions and Discharges will not damage the environment, nor threaten human health	1.1 Improved quality and more sustainable use of rivers, lakes, underground waters, estuaries and coastal waters
				3. The causes of pollution, eutrophication and acidification will have been fully controlled	3.1 Risks of harm to people, damage to wildlife, impairment of water supplies, and interference with amenity have been reduced
				4. The quantities of chemicals entering the sea will have been greatly reduced	4.1 Reduced quantities of chemical entering the sea
				8. Inland and coastal waters will be cherished by local communities	8.1 Transparent, fit for purpose monitoring programmes and information dissemination
			Wiser, sustainable use of natural resources	4. Both business and the public sector will be adopting and implementing long term strategies to reduce the consumption of energy and resources	4.1 Organisations will use resources wisely and minimise waste generation
			Limiting and adapting to climate change	8. Environmental monitoring programmes will provide accurate information on the direct effects of climate change	8.2 The likely effects on those wildlife and natural habitats for which we have direct responsibilities, assess, particularly in the aquatic environment
Urban Waste Water Treatment and Nitrates Directive	EU	I	Improved and Protected Inland and Coastal Waters	1. Degraded habitats, especially rivers, estuaries and wetlands will have been restored	1.1 Conservation criteria for safeguarding and wherever possible enhancing key species and habitats applied to all our licensing and operational activities
				1. Abstractions and Discharges will not damage the environment, nor threaten human health	1.1 Improved quality and more sustainable use of rivers, lakes, underground waters, estuaries and coastal waters
				3. The causes of pollution, eutrophication and acidification will have been fully controlled	3.1 Risks of harm to people, damage to wildlife, impairment of water supplies, and interference with amenity have been reduced
				4. The quantities of chemicals entering the sea will have been greatly reduced	4.1 Reduced quantities of chemical entering the sea
			An Enhanced Environment For Wildlife	5. Surface waters will sustain a diverse variety of habitats and wildlife	5.2 Improved habitats and wildlife
				8. Inland and coastal waters will be cherished by local communities	8.1 Transparent, fit for purpose monitoring programmes and information dissemination. 8.2 Waterways will feature as a focus of urban redevelopment
				1. Degraded habitats, especially rivers, estuaries and wetlands will have been restored	1.1 Conservation criteria for safeguarding and wherever possible enhancing key species and habitats applied to all our licensing and operational activities
				3. The UK Biodiversity Action Plan will have been successfully delivered and priority species will no longer be under threat	3.1 Pollution control, water abstraction, flood and tidal defence work and fisheries management measures are sufficient for Agency targets in the UKBAP to be achieved on time
			Wiser, sustainable use of natural resources	4. Both business and the public sector will be adopting and implementing long term strategies to reduce the consumption of energy and resources	4.1 Organisations will use resources wisely and minimise waste generation
			Limiting and adapting to climate change	8. Environmental monitoring programmes will provide accurate information on the direct effects of climate change	8.1 Predictive models improved and a greater sense of urgency achieved.
					8.2 The likely effects on those wildlife and natural habitats for which we have direct responsibilities, assess, particularly in the aquatic environment

Table 4a - Summary of Business Drivers and Monitoring Requirements for Tidal Water

Driver	Customer	IUNO Class	Framework	Outcomes	Goals
			An Enhanced Environment For Wildlife	1. Degraded habitats, especially rivers, estuaries and wetlands will have been restored 3. The UK Biodiversity Action Plan will have been successfully delivered and priority species will no longer be under threat	1.1 Conservation criteria for safeguarding and wherever possible enhancing key species and habitats applied to all our licensing and operational activities 3.1 Pollution control, water abstraction, flood and tidal defence work and fisheries management measures are sufficient for Agency targets in the UKBAP to be achieved on time
Bathing Waters Directive	EU	I	Improved and Protected Inland and Coastal Waters	1. Abstractions and Discharges will not damage the environment, nor threaten human health 8. Inland and coastal waters will be cherished by local communities	1.1 Improved quality and more sustainable use of rivers, lakes, underground waters, estuaries and coastal waters 8.1 Transparent, fit for purpose monitoring programmes and information dissemination.
Shellfish Waters Directive	EU	I	Improved and Protected Inland and Coastal Waters	1. Abstractions and Discharges will not damage the environment, nor threaten human health 3. The causes of pollution, eutrophication and acidification will have been fully controlled 8. Inland and coastal waters will be cherished by local communities	1.1 Improved quality and more sustainable use of rivers, lakes, underground waters, estuaries and coastal waters 3.1 Risks of harm to people, damage to wildlife, impairment of water supplies, and interference with amenity have been reduced 8.1 Transparent, fit for purpose monitoring programmes and information dissemination.
Habitats Directive	EU	I	An Enhanced Environment For Wildlife	1. Degraded habitats, especially rivers, estuaries and wetlands will have been restored 5. Urban and rural land-use practices will encourage the protection and restoration of habitats, species and natural processes	1.1 Conservation criteria for safeguarding and wherever possible enhancing key species and habitats applied to all our licensing and operational activities 5.1 Habitat restoration is integral to development policies and plans. 5.3 Every opportunity is taken to create and restore habitats
			Limiting and adapting to climate change	8. Environmental monitoring programmes will provide accurate information on the direct effects of climate change	8.2 The likely effects on those wildlife and natural habitats for which we have direct responsibilities, assessed, particularly in the aquatic environment 8.3 Baseline information at key environmental sites obtained to a high level of accuracy and precision - to record the effects of climate change.
Oslo and Paris Commission Strategies	DEFR / OSPAR	U			
National Marine Monitoring Programme	DEFR / OSPAR	U	Improved and Protected Inland and Coastal Waters	1. Abstractions and Discharges will not damage the environment, nor threaten human health 3. The causes of pollution, eutrophication and acidification will have been fully controlled 4. The quantities of chemicals entering the sea will have been greatly reduced 8. Inland and coastal waters will be cherished by local communities	1.1 Improved quality and more sustainable use of rivers, lakes, underground waters, estuaries and coastal waters 3.1 Risks of harm to people, damage to wildlife, impairment of water supplies, and interference with amenity have been reduced 4.1 Reduced quantities of chemical entering the sea 8.1 Transparent, fit for purpose monitoring programmes and information dissemination.
			An Enhanced Environment For Wildlife	4. Rivers, estuaries, lakes and canals will all support appropriate fish communities.	4.1 An improved ability to measure the population and health of fish.

Table 4a - Summary of Business Drivers and Monitoring Requirements for Tidal Water

Driver	Customer	IUNO Class	Framework	Outcomes	Goals
			Limiting and adapting to climate change	8. Environmental monitoring programmes will provide accurate information on the direct effects of climate change	8.3 Baseline information at key environmental sites obtained to a high level of accuracy and precision - to record the effects of climate change.
			Wiser, sustainable use of natural resources	4. Both business and the public sector will be adopting and implementing long term strategies to reduce the consumption of energy and resources	4.1 Organisations will use resources wisely and minimise waste generation
Biodiversity Action Plans	EU	U	An Enhanced Environment For Wildlife	1. Degraded habitats, especially rivers, estuaries and wetlands will have been restored	1.1 Conservation criteria for safeguarding and wherever possible enhancing key species and habitats applied to all our licensing and operational activities
				3. The UK Biodiversity Action Plan will have been successfully delivered and priority species will no longer be under threat	3.1 Pollution control, water abstraction, flood and tidal defence work and fisheries management measures are sufficient for Agency targets in the UKBAP to be achieved on time
Conservancy Duties	DEFR?	U	Limiting and adapting to climate change	8. Environmental monitoring programmes will provide accurate information on the direct effects of climate change	8.2 The likely effects on those wildlife and natural habitats for which we have direct responsibilities, assessed, particularly in the aquatic environment.
			Improved and Protected Inland and Coastal Waters	7. Surface waters will be regarded as a recreational and amenity asset	7.1 Improved and developed Agency's navigations. 7.2 The statutory Code of Practice on Conservation, Access and Recreation implemented. 7.3 Regional strategies for recreation are in place that make use of the full potential of waters
Eutrophication Control Action Plans	EA	N	Improved and Protected Inland and Coastal Waters	3. The causes of pollution, eutrophication and acidification will have been fully controlled	3.1 Risks of harm to people, damage to wildlife, impairment of water supplies, and interference with amenity have been reduced
			An Enhanced Environment For Wildlife	1. Degraded habitats, especially rivers, estuaries and wetlands will have been restored	1.1 Conservation criteria for safeguarding and wherever possible enhancing key species and habitats applied to all our licensing and operational activities
				3. The UK Biodiversity Action Plan will have been successfully delivered and priority species will no longer be under threat	3.1 Pollution control, water abstraction, flood and tidal defence work and fisheries management measures are sufficient for Agency targets in the UKBAP to be achieved on time
				7. There will be broad consensus on how biodiversity should be managed against a background of climate change.	7.2 Species and habitat changes taken into account in determining environmental licences, carrying out our flood and tidal defence works, and managing our own land.
Nuisance Marine Algae Monitoring	DEFR	N	Improved and Protected Inland and Coastal Waters	1. Abstractions and Discharges will not damage the environment, nor threaten human health	1.1 Improved quality and more sustainable use of rivers, lakes, underground waters, estuaries and coastal waters
				3. The causes of pollution, eutrophication and acidification will have been fully controlled	3.1 Risks of harm to people, damage to wildlife, impairment of water supplies, and interference with amenity have been reduced
				8. Inland and coastal waters will be cherished by local communities	8.1 Transparent, fit for purpose monitoring programmes and information dissemination.
Catchment Abstraction Management Strategy	EA	N	Improved and Protected Inland and Coastal Waters	1. Abstractions and Discharges will not damage the environment, nor threaten human health	1.2 National and Regional Water Resources Strategies and Catchment Abstraction Management Strategies in place
			An Enhanced Environment For Wildlife	1. Degraded habitats, especially rivers, estuaries and wetlands will have been restored	1.1 Conservation criteria for safeguarding and wherever possible enhancing key species and habitats applied to all our licensing and operational activities

Table 4a - Summary of Business Drivers and Monitoring Requirements for Tidal Water

Driver	Customer	IUNO Class	Framework	Outcomes	Goals
				<p>3. The UK Biodiversity Action Plan will have been successfully delivered and priority species will no longer be under threat</p> <p>5. Urban and rural land-use practices will encourage the protection and restoration of habitats, species and natural processes</p> <p>7. There will be broad consensus on how biodiversity should be managed against a background of climate change.</p>	<p>3.1 Pollution control, water abstraction, flood and tidal defence work and fisheries management measures are sufficient for Agency targets in the UKBAP to be achieved on time</p> <p>5.1 Habitat restoration is integral to development policies and plans.</p> <p>5.3 Every opportunity is taken to create and restore habitats</p> <p>7.2 Species and habitat changes taken into account in determining environmental licences, carrying out our flood and tidal defence works, and managing our own land.</p>
Coastal Habitat Management Plans	DEFR	U	An Enhanced Environment For Wildlife	<p>5. Urban and rural land-use practices will encourage the protection and restoration of habitats, species and natural processes</p> <p>7. There will be broad consensus on how biodiversity should be managed against a background of climate change.</p>	<p>5.1 Habitat restoration is integral to development policies and plans.</p> <p>5.2 Our own land shows overall increase in biodiversity.</p> <p>7.2 Species and habitat changes taken into account in determining environmental licences, carrying out our flood and tidal defence works, and managing our own land.</p>
			Reducing Flood Risk	<p>4a. Flood defences will be designed and constructed to deliver optimum environmental benefits.</p> <p>4b. Positive aspects of natural flood events will be recognised, and flood defences designed to work with nature in accommodating them.</p> <p>8. Innovative uses of technology will improve the ability to predict and cope with floods</p>	<p>4.1 New defences will have a low adverse impact on the environment and maximum environmental enhancements for the benefit of wildlife.</p> <p>4.2 Managed realignment and foreshore recharge incorporated into coastal defences at sites for which they are the most cost-effective and environmentally beneficial option.</p> <p>8.2 Improved remote sensing techniques for data collection.</p>
			Limiting and adapting to climate change	<p>8. Environmental monitoring programmes will provide accurate information on the direct effects of climate change</p>	<p>8.1 Predictive models improved and a greater sense of urgency achieved.</p> <p>8.2 The likely effects on those wildlife and natural habitats for which we have direct responsibilities, assess, particularly in the aquatic environment.</p> <p>8.3 Baseline information at key environmental sites obtained to a high level of accuracy and precision - to record the effects of climate change.</p>
Shoreline Management Plans	DEFR	U	An Enhanced Environment For Wildlife	<p>5. Urban and rural land-use practices will encourage the protection and restoration of habitats, species and natural processes</p> <p>7. There will be broad consensus on how biodiversity should be managed against a background of climate change.</p>	<p>5.1 Habitat restoration is integral to development policies and plans.</p> <p>5.2 Our own land shows overall increase in biodiversity.</p> <p>7.2 Species and habitat changes taken into account in determining environmental licences, carrying out our flood and tidal defence works, and managing our own land.</p>
			Reducing Flood Risk	<p>4a. Flood defences will be designed and constructed to deliver optimum environmental benefits.</p> <p>4b. Positive aspects of natural flood events will be recognised, and flood defences designed to work with nature in accommodating them.</p>	<p>4.1 New defences will have a low adverse impact on the environment and maximum environmental enhancements for the benefit of wildlife.</p> <p>4.2 Managed realignment and foreshore recharge incorporated into coastal defences at sites for which they are the most cost-effective and environmentally beneficial option.</p>

Table 4a - Summary of Business Drivers and Monitoring Requirements for Tidal Water

Driver	Customer	IUNO Class	Framework	Outcomes	Goals
				8. Innovative uses of technology will improve the ability to predict and cope with floods	8.2 Improved remote sensing techniques for data collection.
			Limiting and adapting to climate change	8. Environmental monitoring programmes will provide accurate information on the direct effects of climate change	8.1 Predictive models improved and a greater sense of urgency achieved. 8.2 The likely effects on those wildlife and natural habitats for which we have direct responsibilities, assess, particularly in the aquatic environment. 8.3 Baseline information at key environmental sites obtained to a high level of accuracy and precision - to record the effects of climate change.
Local Environment Action Plans (LEAPs)	Region / Area	O	Individual case dependent		
Pollution Incidents	Region / Area	O	Improved and Protected Inland and Coastal Waters	2. Wildlife corridors and their associated habitats will be of high quality, with no artificial barriers to wildlife movement.	2.1 An increased network of linked wildlife habitats and sites developed.
MEHRA	DEFR	U	Improved and Protected Inland and Coastal Waters	2. Wildlife corridors and their associated habitats will be of high quality, with no artificial barriers to wildlife movement.	2.1 An increased network of linked wildlife habitats and sites developed.
			An Enhanced Environment For Wildlife	1. Degraded habitats, especially rivers, estuaries and wetlands will have been restored	1.1 Conservation criteria for safeguarding and wherever possible enhancing key species and habitats applied to all our licensing and operational activities
Non-native Species Review	DEFR	U	An Enhanced Environment For Wildlife	8. Environmental monitoring programmes will provide accurate information on the direct effects of climate change	8.2 The likely effects on those wildlife and natural habitats for which we have direct responsibilities, assess, particularly in the aquatic environment. 8.3 Baseline information at key environmental sites obtained to a high level of accuracy and precision - to record the effects of climate change.
Operational Work	Regional / Area	O	Individual case dependent		

Table 4b - Summary of Monitoring Requirements

Drivers	Increase / Decrease	Monitoring Requirement	Frequency	Number of Sites	Comments
Water Framework Directive	Increase	Macroinvertebrate community, estuarine fish community, phytoplankton, macroalgae	3 years	All transitional and coastal waters	Programme in development - R & D funding supporting regional review and testing of data with some new data collection in 2001.
Dangerous Substances Directive	Decrease?	Sediment chemistry and / or bioaccumulation (resident biota), water chemistry (List I & II)	Annual	307 List I, 242 List II (mostly water chemistry but some sediment and biota)	"Standstill" provision for List I substances liable to accumulation in sediments or biota (Mercury has an actual value)
Chloro-alkali Directive	No change	Water and sediments	Once per annum	13	Only undertaken in NW Region
Urban Waste Water and Nitrates Directive	Increase?	Phytoplankton, macroalgae, water chemistry (nutrients and supporting determinands)	Summer months	48 (refers to geographic areas)	Includes existing designated Sensitive Areas (5), candidate SAs being assessed and coastal ex - HNDAs
Shellfish Waters Directive	Decrease?	Bacteriology, water chemistry	12	Designated Shellfish	
Habitats Directive	Increase	Surveillance, condition and compliance monitoring of designated habitats within	3 years	36?	

Table 4b - Summary of Monitoring Requirements

Drivers	Increase / Decrease	Monitoring Requirement	Frequency	Number of Sites	Comments
OSPAR Convention	Increase	Eutrophication, Hazardous Substances, Biodiversity and Radioactive Substances Strategies	Annual	Coastal Waters	e.g. eutrophication strategy common procedure applies to: potential problem areas; Forth - Portsmouth, South Wales,
National Marine Monitoring Programme	Increase	Benthic macrofauna, bioaccumulation (fish, mussels and algae), sediment chemistry (NMMP Suite), water chemistry (local requirements for List I & II), oyster embryo larvae (OEL)	1 p.a. except water chemistry and OEL 4 p.a.	40	
Biodiversity Action Plans	Increase?	Assessment of status designated species		19 marine habitats, 31 species	
Non-native Species Review	Increase?	All routine biological assessment - incidental occurrence of alien	N/A	N/A	Review to be completed in 2002
Operational - Discharge Impact Assessment	No change	Region/Area defined	Region/Area defined	Region/Area defined	
Operational - Pre - consenting studies and post scheme	No change	Region/Area defined	Region/Area defined	Region/Area defined	
Operational - Detection of trends and WQ	Decrease?	Region/Area defined	Region/Area defined	Region/Area defined	
Operational - R & D and Regional Operational Investigation	Increase	Region/Area defined	Region/Area defined	Region/Area defined	
Operational - Defensive Studies	No change	Region/Area defined	Region/Area defined	Region/Area defined	

Table 4b - Summary of Monitoring Requirements

Drivers	Increase / Decrease	Monitoring Requirement	Frequency	Number of Sites	Comments
Operational - Post Pollution Incidents	No change	Region/Area defined	Region/Area defined	Region/Area defined	
Tioxide Directive	No change	Benthic macrofauna, bioaccumulation (representative species), presence of morbid anatomical lesions in fish, sediments and water chemistry	Biology 1 p.a., water 3 p.a.	16 water, 37 sediments (macrobenthos, chemistry), 5 bioaccumulation	NE and Anglian Region only, regionally defined strategy.
Nuisance Marine Algae Monitoring	No change	Phytoplankton, chlorophyll a	Summer months	Designated bathing waters	Best endeavours and Minimum Effort Phytoplankton Monitoring carried out alongside Bathing Waters Directive
NWC Estuary Classification	Replaced by Water Framework Directive	Macroinvertebrate community, fish community, bioaccumulation	5 yearly	175 estuaries	Inconsistent between regions. To be superseded by Water Framework Directive from 2001.
Catchment Abstraction Management Strategy	?	Site specific	-	-	
Shoreline Management Plans	Increase	According to guidance issued by DEFR (Shoreline Management Plans: A Guide for Coastal Defence Authorities 2001)	-	-	Shoreline Mnmt plans produced for all Region e.g. 6 in Anglian Region

Table 4b - Summary of Monitoring Requirements

Drivers	Increase / Decrease	Monitoring Requirement	Frequency	Number of Sites	Comments
Coastal Habitat Management Plans	Increase	Site specific according to EU designated features / habitats	-	-	Linked to Shoreline Management Plans - 9 pilot projects with 50% LIFE funding from EU
Local Environment Action Plans	No change	Specific to local issues	-	-	-
Eutrophication Control Action Plans	Increase	Nutrients, biological "endpoints" (e.g. macroalgal mats), modelling	-	Currently 1 pilot site in the Tees estuary	-
MEHRA	Increase	None	None	Sensitive areas identified	

surface waters in particular, will be assessed against "good status" as well as the more traditional assessment of chemical quality.

There will be limited exceptions to, or derogations from, achieving these objectives. In particular bodies of water which are artificial in construction or where the physical structure has been irrevocably and heavily modified will be required to achieve a status of "good ecological potential". This status is equivalent to achieving good status given the constraints of the physical structure of the water body. Derogations from "good status" are also allowed in unforeseen or exceptional circumstances, such as floods or droughts. In these circumstances Member States must take "any practical means" to restore the waterbody to its previous status.

The Directive also provides for protection to higher standards through the designation of Protected Areas, for example for water supply, recreational waters, nutrient sensitive waters or nature conservation or economically important aquatic species.

These improvements in water status are to be achieved through a system of analysis and planning based upon the river basin, called River Basin Management Planning (RBMP). RBMP is the key administrative mechanism identified in Article 13 of the Directive for the delivery of environmental objectives. This approach accords closely with the Environment Agency's established practice in England and Wales; in particular the current practice of catchment management planning will provide an excellent basis for the development of the River Basin Management Plans (RBPs) required by the Directive. These RBPs set out a Programme of Measures for the achievement "Good Status", and are to be subject to public consultation, thus introducing an element of social participation and transparency.

Economic considerations are also an important element of the Directive; Article 9 requires Member States to take account of the principle of recovery of the costs of water services, and to make judgements about the most cost effective combination of measures in respect of water use.

Article 10 brings forward new provisions to regulate pollution from Dangerous Substances. These provisions include the establishment of a Combined Approach, which permits the use of both Environmental Quality Standards and fixed Emission Limit Values.

The WFD will replace a number of the existing water quality Directives which form an important constituent of current UK water management practice and for which the Agency is a Competent Authority, for example those concerning Surface Water Abstraction, Freshwater Fisheries, Shellfish Waters, Groundwater Protection, and Dangerous Substances. The repeal of these existing European Directives and Decisions under Article 21 will be phased to ensure that at least the same level of protection is afforded to water quality.

Scope of the Directive

The provisions of the WFD will apply to transitional water (including estuaries and coastal lagoons) and coastal waters (to one nautical mile from the baseline). The Agency is currently negotiating with DEFRA and recommending that the seaward boundary of River Basin Districts is extended to 3 nautical miles seaward of the Territorial Seas Baseline in England and Wales (see below). The WFD prescribes an objective based approach to drive

improvements and maintain current status. An important benefit of these objectives is that they integrate water quality and water quantity issues for surface and ground waters.

Surface Water Status

Surface Water Status is assessed using two components; Ecological Status and Chemical (pollutant) Status.

Chemical Status

Under the WFD, European wide Environmental Quality Standards will be set for the "priority list" of substances. This list is reviewed periodically – substances are chosen on the basis of the risk that they present to the aquatic environment. To achieve "Good Chemical Status", these European EQSs must be met. Specific chemical standards, measured by the presence of priority substances, apply out to the limit of Member States' territorial seas' ie up to 12 nautical miles (nm) seaward from the territorial baseline.

The "Priority List"

The Dangerous Substances Directive will be repealed under the Water Framework Directive. However, similar provisions to those in the Dangerous Substances Directive are made in the WFD. These revised Dangerous Substances provisions will introduce:

- A Combined Approach, whereby there will be a requirement for Member States to apply both European wide EQSs and Emission Limit Values, as opposed to the Parallel approach under 76/464/EEC which left the choice with the Member State;
- A "de minimus" provision; and
- A procedure for the specification of the 'priority list' to initially augment, and then replace 76/464/EEC List 1 substances¹.

The first list of 32 Priority Substances has now been formally adopted. This was established based on a simplified risk assessment. The risk assessment is based on a combination of monitoring data, intrinsic properties of the substances and use patterns (as assessed by modelling). This combined monitoring and modelling approach is referred to as the COMMPs procedure. The Commission has commissioned the Fraunhofer Institute (Germany) to derive EU wide standards and controls for those substances appearing on the "priority list". Agency technical experts are involved in this process via a European Expert Group which has been set up for this purpose.

Ecological Status

Under the Directive, standards for ecological status apply out to the limit of coastal waters, which are defined in the Directive as "one nautical mile from the nearest point of the baseline from which the breadth of territorial waters" ie one nautical mile from baseline. The Agency is proposing that England and Wales should extend River Basin Districts and hence ecological status objectives to 3 nautical miles seaward from territorial baseline. Scotland

¹ The first list of Priority Substances has now been adopted. This has now replaced the list of 129 candidate List 1 substances published in 1982.

has already indicated that they wish to do this and Northern Ireland are currently discussing this point.

The exact definition of Ecological Status is provided in Annex V of the Directive. It will be assessed by considering biological, hydromorphological, and physico-chemical elements of quality.

Biological Parameters

Natural ecological variability does not allow absolute biological standards to be established for implementation across the EU. It is proposed that biological quality be judged on the basis of the degree of deviation of the observed conditions from those that would be expected in the absence of significant anthropogenic influence (high ecological status). The WFD includes procedures that will enable this point to be identified for a given body of water, and a system for ensuring comparability between the differing biological monitoring systems used within each Member State.

The biological elements for most of the water body types considered include aquatic flora (macrophytes and diatoms), macroinvertebrates, and fish.

Hydromorphological Parameters

The Directive specifies that Member States must assess the hydrological and morphological condition of water bodies. Although the Directive will not set standards for these elements as such, it will require Member States to monitor and manage the hydromorphological state of the water body in such a way as to ensure conditions consistent with the survival and reproduction of the biota associated with good biological quality.

Physico- Chemical Parameters

The physico-chemical aspects of ecological quality are divided into general, priority list pollutants and pollutants not on the priority list each of which has a different approach to standards.

The WFD will fundamentally change the way in which tidal waters activities are undertaken in the future. For the first time the Agency will be required to classify the coastal waters of England and Wales in terms of its biological, hydromorphological and chemical characteristics and develop a classification system for transitional waters (estuaries) which replaces the previously applied National Water Council Classification Scheme.

Preparations for the implementation of the Directive are already underway. For transitional and coastal waters guidance is being developed for typology, water bodies, reference conditions, classification and monitoring by the UK (lead) in partnership with other European countries and is due to be published in June 2002. Marine aspects of the WFD are being developed by the UK Transitional and Coastal Waters Technical Advisory Group.

As well as policy and strategic issues there are many technical issues which need to be considered. Tidal waters activities will undoubtedly increase as a result of the increasing need for information to assess the ecological status of transitional and coastal waters. The

scale of this activity in terms of monitoring and surveillance is yet to be determined and will become clearer once the Transitional and Coastal waters guidance is published.

Recommendation 3.4.1

Timetables for the Water Framework Directive are clearly stated to ensure developments in tidal waters meet the needs of the Directive.

The need for policy, strategic and technical development of the Directive is acknowledged and appropriately resourced to ensure appropriate development of WFD in tidal waters.

3.4.2 Dangerous Substances Directive (76/464/EEC)

EC Directive 76/464/EEC and Daughter Directives are a series of Directives aimed at reducing pollution of waters by seeking to eliminate discharge of the most dangerous substances in terms of persistence, toxicity and bioaccumulation (List I substances) and by reducing the input of others (List II substances). The primary objective of the directive is to harmonize the legislation of the EU Member States on discharges of certain dangerous substances into the aquatic environment and to take preventive action at source.

In 1989 the Department of the Environment provided additional guidance to competent authorities for the implementation of the directive (Circular 7/89) which provided further guidance on monitoring requirements. The competent authority at the time was the National Rivers Authority and a technical group was set up to consider the operational monitoring requirements.

The List I substances have had Environmental Quality Standards (EQSs) assigned by the EEC. The identification of List II substances and the setting of appropriate EQSs was left to the individual Member States guided by the framework Directive 76/464/EC. Recent amendments to this legislation identifying new List II substances have had additional implications for monitoring.

Monitoring should be carried out in all waters receiving identified discharges of these substances. Circular 7/89 requires that the position of the monitoring point should be sufficiently close to the discharge point to be representative of the aquatic environment in the area affected by the discharge.

In the Regions, a judgement on appropriate sampling points is based on local knowledge. The Agency monitoring manual sets out a tiered guidance to assist this process:

Tier 1

Samples should be collected in the immediate vicinity of the effluent discharge point where the concentration is likely to be greatest. Where the EQS is likely to be exceeded at this point, or where sampling is impractical, Tier 2 monitoring should be undertaken.

Tier 2

Sample at 100m and 250m from the point of maximum concentration. The exact point will be dependent on tidal state and effluent movement. Where the EQS is likely to be exceeded at 250m from the discharge, Tier 3 monitoring should be carried out.

Tier 3

Where EQS exceeded at 250m, the full extent of exceedence should be determined by the use of predictive numerical models and/or intensive grid sampling. Representative sampling sites should then be chosen for compliance monitoring taking into account the area of exceedence for particular tidal conditions.

The monitoring manual sets out the minimum frequency of monitoring. This frequency was determined by the Agency's predecessor, the National Rivers Authority and agreed with DoE. The guidance in the Agency's Environmental Monitoring Manual stipulates that where possible, 12 samples per annum should be taken at the agreed sampling points. At some locations it will be impractical to sample at that frequency. Where this is the case, it is acceptable to sample at a lower frequency, with 4 per annum being the absolute minimum. However, importantly the manual stipulates that it may be appropriate to use two sampling points, one for the flood tide and one for the ebb tide. The two points should be reported separately, but the number of samples from each can be combined to achieve the required sampling frequency. Results from no more than two sample points related to the particular discharge point should be reported.

A general principle regarding the 12 x per annum sampling and tidal state has also come to light in discussions with the Regions which is not specified in the monitoring manual. Some regions suggest that during and following designation of the compliance monitoring site; samples should be collected over a representative range of tidal states in order to characterise the receiving environment in an unbiased manner. Emphasis on low or high water sampling may unduly influence the results to best case or worst case conditions. Implicit in the monitoring requirement is the need to characterise the receiving water to adequately reflect the water quality at that point. Any point will be subjected to a wide range of tidal influences and the monitoring should be adequately targeted over a range of tidal conditions so that annual averages reflect the full range of conditions encountered in the receiving environment to give a fair and unbiased assessment of compliance.

As well as discharge monitoring, there is also a requirement to monitor at National Network sites for List I substances. Sites are chosen to correspond to all discharges where there is one or more List I substance discharged and where it is known or suspected that diffuse inputs of any List I substance will contribute to measurable concentrations in the receiving water. It is also recommended that where appropriate these sites should correspond to the National Marine Monitoring Programme sites.

The new List II substances are required at a minimum frequency of 12 x per annum at both national network sites and discharge locations. However, logistically this does not necessarily mean 12 surveys since, as stipulated above flood and ebb tide monitoring can count as two towards the required sampling frequency.

For those List I substances where a "standstill" provision applies there is also a requirement to monitor levels in sediments and/ or molluscs and/or shellfish and/ or fish. Samples should be collected at the same time every year and for sediments the <63µm fraction should be analysed. Sediment samples should be collected in stable sediment regimes at a minimum of once per annum.

Current Programme

Figure 5 and Appendix 7 shows the list of current sites monitored by Region which are assessed for compliance with the directive, including monitoring frequency. An indication is also provided at which sediments and/or biota are also collected. It is clear that there are a range of approaches from the minimum frequency described above (4x) to the maximum (12x).

Future changes / issues

Many of the coastal and estuarine discharges correspond to sewage outfalls. All of the larger outfalls are now being subjected to secondary treatment. It is expected that the risk of EQS failures in the receiving environment will be much less likely in the future since the majority of the organic and metallic effluents consented for discharge through these combined discharges will be retained in the sludge derived from secondary treatment.

However, there are a number of long-term EQS problems that arise from the historical sediment contamination in the industrialised estuaries. Permitting operations and development in such areas can be restricted by such historical contamination and there is little that can be done to reduce such contamination aside from natural processes.

The Scottish Environment Protection Agency similarly operates a monitoring regime in coastal and estuarine waters for the purposes of this Directive. As a general rule SEPA frequencies correspond to the Agency's minimum monitoring requirements on the basis that it is difficult logistically to attain a higher frequency in the marine environment. This is deemed to be acceptable to meet the requirements of the Directive. It can be recommended that the Agency reviews its current position with respect to the frequency of monitoring and the guidance issued since there is no specified frequency of monitoring in the Directive.

The three tier approach to monitoring required to fulfil the requirements of the Directive has been designed to accommodate the linear dilution gradients which are expected for discharges into freshwater river systems. However, this is not a technically sound approach in tidal waters where factors relating to initial dilution in the water column, tidally induced currents and wind driven circulation patterns interact to greatly modify effluent dispersion. This results in a very variable mixing zone which cannot, in many cases, be adequately monitored. As this type of location can usually only be sampled by boat, the net result is that very expensive monitoring programmes are undertaken which deliver data of highly questionable validity. The approach adopted to monitor these discharges for compliance with the Directive should be reviewed and a more cost effective and technically justifiable strategy adopted.

For planning purposes the Environmental Strategy Directorate has indicated that the current programme will not change for the foreseeable future, however there is scope for change within the existing programme.



**Figure 5 : Environment Agency Marine Sampling Programme
DSD List 1 & List 2 Sampling Sites - 2001**

The Dangerous Substances Directive will be repealed in 2013 and will be replaced by the Water Framework Directive. This will have implications for the frequency of monitoring in the future and quotes monthly frequencies for surveillance monitoring for priority substances and quarterly for other pollutants. These frequencies are to be applied unless lesser intervals would be justified on the basis of technical knowledge and expert judgement. This would appear to add weight to the need to review monitoring frequencies since the Agency already has the flexibility to reduce to 4 x per annum it would appear that this could continue for Water Framework Directive if expert judgement deemed this appropriate. For example, a history of EQS compliance at a point source could lead to an assessment that a frequency of 4 x as opposed to 12 was more appropriate.

Recommendations 3.4.2

Consideration is given to a reduction in the frequency of environmental monitoring at some sites for the purposes of the Dangerous Substances Directive.

The guidance is reviewed to provide more prescriptive, technically sound and cost effective monitoring to ensure a consistent approach to the environmental monitoring in the future.

3.4.3 Titanium Dioxide Directive Monitoring (78/176/EEC, 82/883/EEC)

The objective of these two sister directives is to prevent and progressively reduce pollution caused by waste from the Titanium dioxide industry and to fix common reference methods of measurement for sampling in order to conserve environments concerned by titanium dioxide waste.

The requirements of the directive are set out in Appendix 8. Monitoring of the receiving water quality is undertaken at a minimum frequency of 3 times per annum as specified by the Directive. The Directive also requires classification of benthic communities, sediment metal analysis and body burden analysis of appropriate species once per annum. Samples are taken in the immediate vicinity of the discharge point and in a neighbouring zone deemed to be unaffected by the discharge.

There are three discharges in the UK which are regulated by this directive, one at Greatham on Teesside, discharging to Greatham Creek, part of the Tees Estuary and two discharges into the lower Humber estuary. The Regions determine the monitoring programmes and the data is reported annually.

A recent acid spill at the Tees estuary site illustrates the continuing need to monitor the effects of these discharges. Monitoring is likely to continue at its current level, but the implementation of the Habitats Directive is likely to require a different emphasis in the programme more to biological effects monitoring.

3.4.4 Chloro-alkali Directive (76/464/EEC)

The objective of this directive is to limit discharges of mercury into the aquatic environment of the Community. For plant in which alkali chlorides are electrolyzed by means of mercury cells the directive lays down the following:

- limit values for emission standards for mercury into the above mentioned waters and the time limits by which they must be complied with;
- the reference methods of measurement enabling the mercury content in discharges and in the aquatic environment to be determined;
- a procedure for monitoring discharges.

Presently only one Region (North West) requires monitoring associated with this Directive in tidal waters. The programme is determined by the Region and reported annually. Water and sediment samples are collected in the Weston and Manchester Ship Canals

The requirement for this directive will remain unchanged for the foreseeable future.

3.4.5 Urban Waste Water Treatment (91/271/EEC) and Nitrates Directive (91/676/EEC)

The Urban Waste Water Treatment (UWWT) Directive concerns the collection, treatment and discharge of urban waste water and the treatment and discharge of waste water from certain industrial sectors. Its aim is to protect the environment from any adverse effects due to discharge of such waters. The Nitrates Directive aims to reduce or prevent water pollution caused or induced by nitrates from agricultural sources. In coastal waters the two directives need to be set in context with one another due to the potential combined effects of point source and diffuse inputs to in the marine environment to facilitate effective regulatory control.

The UWWT Directive sets out the requirements for effluent treatment from organic discharges, typically domestic sewage, with reference to the environmental impact of specific discharges on the receiving environment, their sensitivity to eutrophication (typically adverse effects such as algal blooms) and impact upon benthic communities.

In May 1994, the Department of the Environment at the time designated High Natural Dispersion Areas in tidal waters. A panel of government experts was convened to design a monitoring programme which would be required to be undertaken by the water companies to demonstrate the impact on the receiving environment where such discharges occurred in HNDAs. Comprehensive Studies were undertaken at all coastal outfall locations which discharged from a combined population greater than 15000.

Since the decision to remove HNDA status, DETR asked the Agency to assess certain specific areas (previously those HNDAs which were likely to fail the standards assessed as part of the Comprehensive Studies exercise) with a view to establishing whether or not these areas are eutrophic and warrant Sensitive Area (SA) status. In 1998 a strategy was agreed by the NMS Customer Group for the assessment of these areas in coastal waters, half way through the 1996 - 2000 four year assessment period (see Appendix 3 and Figure 6 for locations and strategy).



**Figure 6 : Location of Candidate Sensitive Areas
(ex-HNDA Zones)**

As well as coastal areas a number of estuaries are also either designated or candidates SAs. Appendix 3 sets out these locations and indicates in which Regions these areas are located. It is unlikely that monitoring will continue in the future at all of these sites. The programme for 2001-2004 is yet to be determined.

Whilst Sensitive Area assessment is part of the UWWTD, the Agency's monitoring manual takes into account the Nitrates Directive and discusses monitoring SAs with reference to both directives. Those areas designated as potentially eutrophic or eutrophic under the Nitrates Directive are actually referred to as 'Polluted Waters' but are called Sensitive Areas in this report for simplicity. Assessment and monitoring needs to take into account both point source and diffuse inputs to avoid poorly targeted regulatory control.

As well as the statutory requirement to assess Sensitive Areas, the Agency released a Eutrophication strategy in August 2000. This promotes improved policy co-ordination, a partnership approach to eutrophication management, measures to reduce nutrient inputs to water nationally and more comprehensive catchment-based action for priority (impacted or sensitive) waters. Local catchment-based action is to be trialed through the introduction of a suite of pilot eutrophication control action plans (ECAPS) during 2000/01. The only current pilot in tidal waters is the Tees Estuary. This plan is based on current information and investigations ongoing at a local level. There is a lower priority list of sites within the ECAP project that include one further tidal site - a coastal location in Northumberland. Local information is expected to be reported for these 'B' sites but not in the form of a full action plan. The Agency's strategy also sets out to honour international commitments for eutrophication assessment from OSPAR (Oslo and Paris Commissions) – see below.

Despite an agreed strategy in 1998 for coastal areas, there continues to be major inconsistencies in the practical assessment of tidal waters for eutrophication, particularly estuaries. This ranges from a reliance on limited or very intensive number of spot samples through to continuous monitoring along stretches of coast for SA assessment through to intensive spot sampling in estuaries during the summer and winter months. The guidance issued in the Environmental Monitoring Programme largely promotes these divergent local approaches through guidance that leaves much open to local interpretation.

The guidance promotes the use of current monitoring programmes in estuaries and the use of spot sampling within estuaries to support the SA assessments however, the guidance requires the regions to produce clear evidence of biological, chemical and adverse impact to support their assessments of Sensitive Area status. The evidence required vary because of the background information and the current survey programmes going on in the locality that can be used to support the case. Consequently, an assessment in a complex estuarine situation varies in intensity and approach.

The coastal sites have promoted continuous work as a result of the agreement reached in 1998 by regional marine scientists within the Agency. These areas are less complex than estuaries and a standardised assessment programme is more achievable. In addition, the sites are larger and therefore it is more practicable to use onboard analysis for large number of samples. Continuous sampling is justified due to the frequency of sampling needed in such large areas and the problems associated with the sample handling and preservation of sea water nutrient samples

There is also some difference between national guidance and regional approach in that marine scientists within the Agency have determined a need for summer nutrients to support biological effects monitoring yet the Agency's Environmental monitoring manual does not state this as a requirement of monitoring. In addition supporting parameters are not stated or defined in terms of accuracy or precision targets.

Overall the scale of monitoring, methods and data assessment are largely left to the Regions to determine. SA data is also used for other purposes such as Habitats Directive where conservation sites have been identified at risk of eutrophication. It is not possible to quantify a programme at this stage. In addition there are synergies with OSPAR, UWWTD and Nitrates Directives and the Phytoplankton monitoring programme.

In 2000 the EU lodged a "Reasoned Opinion" with the UK government expressing concern over the application of the UWWTD and designation of Sensitive Areas in tidal waters from the 1996 Sensitive Area review. Whilst the UK had identified up to 88 water bodies (including fresh waters) as sensitive, the commission considered that more water bodies should have been identified as sensitive, notably certain estuaries and coastal waters (the estuaries of the Thames, the Wash, the Humber, the Deben, the Colne, the waters of Southampton, the coastal waters of North Wales, north western England, South Western Scotland).

The UK has sent a response back to the EU in defence of its assessments. The EU will consider this response in detail before further action is necessary. These cases illustrate the need for robust monitoring of coastal and tidal waters. In addition the OSPAR convention also requires monitoring of the maritime area (see OSPAR below)

Recommendation 3.4.5

A clear strategy, methodology and monitoring programme is agreed for the Regions for 2002 – 2005 for the assessment of eutrophication in tidal waters to ensure a robust defensible approach to SA assessment.

Consideration is given to the inclusion of OSPAR requirements within the existing UWWTD monitoring programmes (see OSPAR below).

3.4.6 Bathing Waters Directive (76/160/EEC)

The objective of the Bathing Waters Directive is to reduce and prevent the pollution of bathing water. The Directive (76/160/EEC) sets out monitoring requirements to assess compliance with mandatory bacteriological standards set out in the directive and to monitor other 'aesthetic' parameters including oil and surfactants. The Agency is required to monitor and sample identified bathing waters during the period 1 May to 30 September (Figure 7). Samples are taken at predetermined sample points off the beach at a frequency of 20 x per annum, with sampling taken at least fortnightly.

The Directive sets out standards that designated bathing waters are required to meet.



**Figure 7 : Environment Agency Marine Sampling Programme
Bathing Beach Sampling Sites - 2001**

The Agency's Bathing Water Policy indicates that imperative standards are mandatory and that the Agency must use its powers to ensure compliance and that cost cannot justify delays in improvement. Guideline values are not mandatory, and cost may be taken into account. Where guideline standards are met then 'no deterioration' is the Agency policy.

Where failures occur it is incumbent on the Agency to investigate the causes of the failures. Recent queries from the EU regarding failures have been lodged with DETR in the form of a reasoned opinion. This particularly focused on NW Region where, despite considerable investment by the Water Company concerned which in turn lead to improvements to sewage effluents discharged to sea, failures continue to be a problem. In such locations it is expected that the level of monitoring will be in excess of that normally expected of this Directive.

Differences in approach have occurred between Regions, where the cost/benefit ratio has been used to implement investment to meet the guideline values.

3.4.7 Shellfish Waters Directive

The objective of this directive is to improve and protect the quality of shellfish waters. The Directive lays down requirements for the quality of designated waters which support shellfish (bivalves and gastropod molluscs). Its purpose is to safeguard shellfish populations from the harmful consequences resulting from the discharge of polluting substances into the sea.

Compliance monitoring is undertaken for a number of parameters for which mandatory and/or guideline standards are given in the directive, together with minimum sampling frequencies. Compliance of designated shellfish waters must be demonstrated. The monitoring requirements for this directive have recently been reviewed and bacteriological sampling is now required 12 x per annum until the end of 2001 at newly designated sites.

DoE issued advice in 1980 on suitable water quality standards for metal and pesticide determinands. These standards are not in line with those in the Dangerous Substances directive. Further guidance will be issued when this issue has been resolved.

The minimum sampling frequency is 4 x per annum for most parameters although some (DO and salinity) are required monthly and others every six months. The period of sampling relative to the state of the tide and the number of samples collected should be determined on the basis of local environmental conditions. Samples over intertidal shellfish beds should be collected within one hour of high water. The monthly sampling of bacteriological parameters is due to end at the end of 2001. The purpose of this additional monitoring was to provide sufficient data for the setting of operational standards.

The Directive clearly states that "Where the competent authority records the quality of designated waters is appreciably higher than that which would result from the application of the values set in accordance with the directive the frequency of sampling may be reduced. Where there is no pollution and no risk of deterioration in the quality of waters, the competent authority concerned may decide that no sampling is necessary". Clearly following on from the 2000-01 intensive sampling that has been undertaken a review of the data is necessary on a site by site basis to determine sampling frequencies in the future. For example it may not be necessary for monthly sampling if for the last 2 years the salinity and dissolved oxygen data have complied with the standards set in the directive. The review should also

take into account results from the Shellfish Hygiene Directive which is the responsibility of MAFF.

Until this review is complete it is not possible to assess the scale of the Shellfish waters programme in the future. Appendix 6 and Figure 8 shows sites that are currently monitored.

Recommendation 3.4.7

Data collected in 2000-01 is reviewed on a site by site basis and future monitoring requirements determined from this review. This review will allow the scale of the future programme to be determined. The review should also take into account results for the Shellfish Hygiene Directive.

3.4.8 Habitats (92/43/EEC) and Wild Birds Directive (79/409/EEC)

Internationally important wildlife sites have been given protection under the European Directives on the Conservation of Wild Birds (79/409/EEC) and the Conservation of Natural Habitats and of Wild Flora and Fauna (92/43/EEC - known as the Habitats Directive). Both Directives have been transposed into the Conservation (Natural Habitats & c.) Regulations 1994 (known as the Habitats Regulations). The network of sites includes Special Areas of Conservation (SACs) and Special Protected Areas (SPAs). There are currently 182 candidate SACS and 87 SPAs in England and Wales, covering a wide range of habitats and species on land and at sea. Figure 9 shows the location of the marine SACs.

The Directive requires the assessment of the impacts of plans or projects on protected areas. The Environment Agency must take full account of the Directive requirements when considering new licences and permissions. The Agency is also required to review all existing licences (alone and in combination) and where necessary amend or revoke those that are found to be causing damage to habitats or species of European importance.

English Nature and Countryside Council for Wales are responsible for ensuring that the Regulations are complied with.

The review of existing permissions affecting all Natura 2000 sites is underway and will be completed by 2006 for high priority sites, and 2008/2010 for medium/low priority sites respectively. Permissions have to be tested initially against 'likely significant effect' and an 'appropriate assessment' is then undertaken to determine whether permissions, alone or in combination, have 'no adverse affect' on the sites. The interpretation of these terms has to be agreed with EN/CCW who sign off each stage of the four-stage process.

Designated estuarine sites are presently of concern, due to the number of permissions to be considered (theoretically all permissions in the entire catchment), the absence of targets/standards for estuaries, and the lack of information for estuarine sites. Issues also arise with the lack of information regarding the condition and requirements of the wildlife features of the site and the causative link to permissions.

For marine sites, the Habitats Directive also requires an action plan to be developed by all relevant authorities. Each relevant authority must secure compliance with the Habitats



**Figure 8 : Environment Agency Marine Sampling Programme
Shellfish Sampling Sites - 2001**



**Figure 9 : Location of Marine Special Areas of Conservation
(in relation to the Environment Agency)**

Directive through its own powers, and the action plan provides the framework to achieve this. The Directive requires that there is only one plan for the site and therefore it must take into account all other plans. There is therefore significant overlap between the marine aspect of River Basin Management Plans under the Water Framework Directive and Habitats Directive marine sites.

Monitoring may be required under the Habitats Regulations and, depending on the circumstances, different organisations may be involved. Surveillance to determine the conservation status of a European interest feature is required by the Directive, as is reporting on implementation of the Directive. These are responsibilities of EN/CCW.

Under the Habitats Regulations the Agency is not currently under an obligation to undertake additional monitoring for establishing the conservation status of the interest features of a site. The Agency will support EN and CCW in monitoring and the Agency will align its monitoring, where possible within the restrictions of its monitoring programme, to help assess site conditions.

For new applications, the Habitats Regulations state that applicants should provide such information as the Agency may reasonably require for the purposes of an "appropriate assessment". In such cases the Agency must provide clear specifications for the information and how it is to be collected and used.

In carrying out the *Review of Permissions*, the Agency will in most cases make use of existing information. There may be occasions when monitoring may be needed in order to obtain information not held by the Agency, EN/CCW. Such monitoring should be in accordance with Agency's current monitoring policies e.g. WQ Monitoring Manual and would be bid for and prioritised accordingly.

EN and CCW should be involved in scoping the monitoring that will underpin the "appropriate assessment".

Recommendation 3.4.8

A strategic overview of technical requirements for Habitat Directive in tidal waters, considered with the requirements of other statutory drivers or international obligations. Consideration should be given to the specialist skills needed within the Agency for the delivery of these projects.

Coastal Habitat Management Plans (CHaMPs)

In England, CHaMPs are to be developed for many coastal site complexes. These are non-statutory plans. The objective of these plans is to identify the flood and coastal defence works that may be required in a given area to conserve the nature conservation interest of a European site or group of such sites, particularly where the current defence line may be unsustainable. These will help to ensure that appropriate schemes are developed where coastal SPAs and SACs are involved. Where flood and coastal defence works are likely to have an adverse effect on the integrity of a site, they will also identify the amount of

replacement habitat that is required to maintain nature conservation status, and should ideally indicate suitable locations where this new habitat will be created.

The CHaMP will draw on information presented in the most recent version of the SMP but will revisit the preferred options for each section of coast, having regard to the need to maintain SPAs and SACs. The level of detail in a CHaMP will be much greater than in the SMP but relevant information in the CHaMP will need to be incorporated in future revisions of the SMP. A CHaMP will contain a similar level of detail to a Strategy Plan for flood and coastal defence, and in time it should be possible to merge the two processes to produce a single, all encompassing strategic plan.

English Nature and the Agency working together with stakeholders prepare CHaMPs. Seven pilot CHaMPs will be produced over the next two years. 50% of the funding is provided by the EU, the rest by the partners to the project.

The sites involved in the are listed below:

Pilot Coastal Habitat Management Plans

Region	CHaMPs
Anglian	Dungeness and Pett Levels
	Essex Coasts and Estuaries
	Suffolk Coast and Estuaries
	Winterton Dunes
	North Norfolk
Southern	Solent Coast and Estuaries
Thames / Southern	North Kent Coast and Estuaries

The process is described in more detail in "Living with the sea: An introductory leaflet".

3.4.9 Environmental Impact Assessment Directive (85/337/EC)

European Community Directive on '*the assessment of the effects of certain public and private projects on the environment*' (85/337/EC), as amended by Directive (97/11/EC).

The Environmental Impact Assessment Directive requires member states to ensure that development consents for public and private projects, which are likely to have significant effects on the environment, should only be granted after prior assessment of the likely significant environmental effects of these projects has been carried out. The Directive requires any assessment to be conducted on the basis of the appropriate information supplied by the developer, which may be supplemented by the authorities and by the people who may be concerned by the project in question. The Directive requires member states

- to employ the best environmental policy in preventing the creation of pollution or nuisances at source, rather than subsequently trying to counteract their effects;
- and affirms the need to take effects on the environment into account at the earliest possible stage in all the technical planning and decision-making processes;

To that end, they provide for the implementation of procedures to evaluate such effects.

The Agency provides guidance targeted at developers, their consultants, Local Planning Authority staff, Agency staff, and others who are involved in promoting and appraising projects and activities which are likely to affect the environment. It is general in nature and does not replace the need for consultation with the Agency and others on individual projects or reference to more detailed guidance. It is intended to be a starting point to help identify key issues and promote full and early involvement of the Environment Agency and other organisations in EIA. It is intended that implementation will be carried out through training of key Agency staff, tying in to Agency policies and procedures, promotion in key journals and through use of the Agency's internet site.

In most instances environmental assessments will be conducted by the developer, however, developments often require detailed knowledge of Agency policy coupled with hydrographic knowledge of an estuary or coastal area. Local contact networks are also important to ensure that all interested parties are consulted ranging from developers/ discharges to pressure groups.

The scoping guidance exists for specific developments in relation to tidal waters activities and are as follows:

- C1. Barrages (see also note I6, Tidal power developments)
- C2. Coastal defence, including beach nourishment
- C3. Ports, shipyards, harbours, piers and jetty developments (including navigation works)
- C4. Sea outfalls
- D1. Dredging of riverine, estuarine and marine sediments (including commercial dredging and dredging for navigation) and reclamation
- D3. Petro-chemical industry - offshore developments, including exploration
- E2. Pipelines (Oil and gas)
- F4. Marinas
- I6. Tidal power developments (see also note C1, Barrages)
- I7. Windfarms both on-shore and offshore

In addition to the EIA Directive, the Strategic Environmental Assessment (SEA) Directive has now been adopted by the EU and is due to be implemented in UK by 2004. The forthcoming SEA Directive will include the principle that where plans & programmes form part of a hierarchy, SEA should be carried out but with a view to avoid duplication of assessment.

Appendix 9 provides a summary of the implications of this Directive in relation to Agency activities.

Recommendation 3.4.9:

A national overview is taken on the development of monitoring requirements arising from Region Coastal Groups and Agency Regional Flood Defence Departments to ensure a consistent approach to the implementation of the DEFRA guidance and development of monitoring programmes.

3.4.10 Oslo and Paris Convention (OSPAR)

The history of OSPAR is set out in more detail in Appendix 13. The Oslo and Paris (OSPAR) Convention for the protection of the marine environment of the NE Atlantic came into force for contracting parties in 1992. The aim of the convention is to prevent and eliminate pollution from the maritime area of the Convention and to ensure that the ecosystems of the maritime area are in a sustainable, sound and healthy condition and that human health is protected. In 1998 and 1999 strategies were adopted for the purposes of directing the work of the Commission in the medium and long term:

1. protection and conservation of ecosystems and biological diversity
2. hazardous substances
3. radioactive substances
4. eutrophication
5. environmental goals and management mechanisms for offshore activities

To monitor environmental quality throughout the north-east Atlantic, the OSPAR Commission adopted a Joint Assessment and Monitoring Programme (JAMP). Together with the JAMP, the above strategies form a basis for the present Action Plan for OSPAR from 1998 – 2003. This Action Plan is set out in Appendix 13.

The National Marine Monitoring Programme is the vehicle for translating some of the monitoring requirements of JAMP into operational tidal waters activity.

There is considerable overlap between OSPAR Strategies and monitoring requirements and those of European Directives outlined above. Most notably the strategies on Hazardous Substances and Eutrophication. Whilst the OSPAR strategies are not a statutory instrument the EU Directives provide the legislative framework to ensure the OSPAR strategies are complied with. However, the requirements for OSPAR are more prescriptive than those of EU Directives and some consideration is needed to ensure that the OSPAR strategies and EU Directives are compatible. A useful example of this is the eutrophication strategy and the requirements of the UWWTD.

The OSPAR Eutrophication Strategy requires contracting parties to identify by a common procedure each part of the maritime area as a problem, potential problem or non-problem area with regard to eutrophication. In implementing the common procedure the commission will develop and adopt common assessment criteria and assess the results of its application by contracting parties. An initial screening procedure has determined that the following UK maritime areas will be subject to the common procedure:

1. North Sea – off the UK east coast from Peterhead southwards
2. The channel – off the UK south coast, from Poole Bay eastwards
3. The mouth of the Severn upstream of a line from Bideford Bay to Carmarthen Bay
4. The Irish Sea / Liverpool Bay region from Anglesey to Solway Firth and;
5. The Firth of Clyde

These areas will be reviewed using existing data and information and reported to SPAR in 2002 to determine the “problem” status of these waters.

The UWWTD requires the assessment of candidate Sensitive Waters where eutrophication is suspected. During the 1996-2000 review period a number of coastal areas and estuaries broadly corresponding to those identified for the OSPAR "Common Procedure" were subject to a data gathering exercise to determine their eutrophication status. This review is due for completion in 2001. The two reviews are therefore timed such that the data could be used for the "Common Procedure" review required by OSPAR. The guidance for monitoring in the Agency's monitoring manual is not compatible with the draft OSPAR monitoring requirements. Since the OSPAR monitoring requirements have not been finalised this inconsistency is likely to continue.

The outcome of the SA reviews is not yet known and it is therefore not possible to predict the future programme. In addition the outcome of the OSPAR common procedure will also not be known until 2002 / 2003. However, it can be concluded that for the purposes of eutrophication assessment the OSPAR and UWWTD monitoring requirements could be reviewed with a view to merging the two data gathering exercises. Since the next review begins in 2002 this review is urgently needed to ensure a consistent approach to monitoring during the next 4-year review period.

Recommendation 3.4.10.1

The assessment needs and monitoring requirements for coastal waters for the Urban Waste Water and Nitrates Directive and OSPAR eutrophication strategy should be reviewed with a view to merging the monitoring requirements.

Radioactive Substances

In June 2000 the UK government published a consultation document on the draft UK strategy for Radioactive Discharges 2001-2020. This document set out the UK plans for implementing the OSPAR Strategy for radioactive substances. The objective of the OSPAR strategy is to relevant pollution of the NE Atlantic maritime area through progressive and substantial reductions in discharges, emissions and losses of radioactive substances. In order to provide information to support this strategy the Agency commissions independent monitoring of the authorised discharges of radionuclides in effluents to the environment and in solid wastes transferred for disposal to provide a check on the monitoring carried out by the site operators. In addition the Agency conducts a comprehensive monitoring programme of radioactivity in the environment resulting from authorised discharges. The environmental monitoring programme is used to provide an independent assessment of the exposure of the public from non-food pathways. During 1999 the Agency's monitoring programme consisted of:

- monitoring of liquid effluents from nuclear licensed sites;
- quality checking of low-level solid radioactive waste;
- environmental monitoring around nuclear and larger non-nuclear premises;
- environmental monitoring around landfill sites that receive waste or are authorised to receive radioactive waste.

Approximately two thirds of the environmental monitoring occurs in the marine environment particularly focusing on nuclear plants such as the BNFL Sellafield site. Biota, sediment and water samples are collected for radionuclide analyses and reported annually.

Recommendation: 3.4.10.2

The environmental monitoring programme for radioactive substances is compared to the environmental monitoring programme for dangerous substances and where overlap occurs consideration is given to merging the sampling activities since the same media are sampled using similar sampling methods.

3.4.11 National Marine Monitoring Programme

The National Marine Monitoring Programme was initiated in 1987/88 in UK estuaries and coastal waters to provide the government with a network of monitoring stations to fulfil its commitments to international agreements such as the Oslo and Paris Commissions and concerns the long term monitoring of trends in physical, biological and chemical variables in the marine environment. It is therefore classified as a statutory programme.

The general aims of the programme are:

- To initiate monitoring programmes to detect with appropriate accuracy long-term trends in physical, biological and chemical variables at selected estuarine and coastal sites.
- To support and ensure consistent standards in national and international monitoring programmes for marine environmental quality (for example: EC Directives, Oslo and Paris Commissions).
- To make recommendations to the Governments Marine Pollution Monitoring and Management Group as to how new analyses and techniques are best implemented in the United Kingdom.
- To co-ordinate, make optimum use of, and gain maximum information from marine monitoring in the United Kingdom.
- To provide and maintain a high quality dataset for key chemical and biological variables in the marine environment of the United Kingdom.
- To produce reports providing overviews of the spatial and temporal distributions of these variables and their inter-relationships.

A major review of the programme was completed in 1998. The initial phase of the programme concentrated on establishing quality control procedures to ensure that nationally and internationally consistent data of a high standard were obtained. The programme has now moved into its second phase – long term temporal trends.

Development of strategic policy in relation to the programme is undertaken through the Environmental Strategy Directorate. Co-ordination, implementation, and technical guidance has been developed through the NMS Customer Group with the co-ordinator of the programme from the Environmental Monitoring and Strategy Directorate being represented on this group. Data is reported from the regions to the National Centre for Environmental Data and Surveillance (NCEDS) which holds the UK NMMP database.

Of the 80 sites in the programme, 40 are the responsibility of the Agency. The sites are illustrated in Figures 10 and 11 and listed in Appendix 12 together with the requirements for monitoring.

3.4.12 Biodiversity Convention

The UK became a Party to the Biodiversity Convention in June 1992. The objectives of this Convention are:

- the conservation of biological diversity;
- the sustainable use of its components; and,
- the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies.

Article 6 requires the UK to develop, or adapt, national strategies, plans or programmes for the conservation and sustainable use of biological diversity and to integrate, as far as possible, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies.

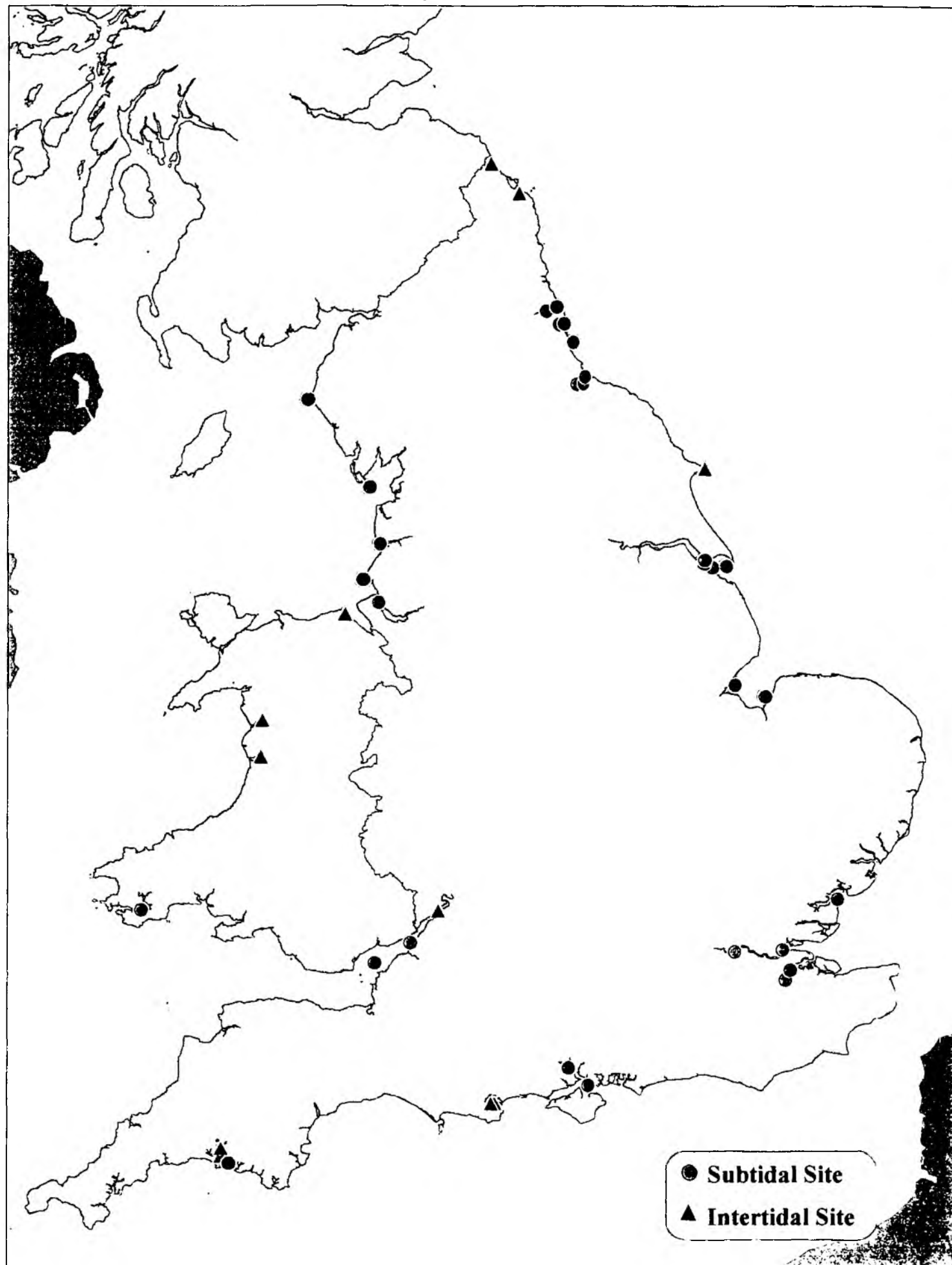
Article 7 requires the UK to identify those components of biological diversity important for its conservation and sustainable use. Those components should be monitored and particular attention should be given to those requiring urgent conservation measures and those which offer the greatest potential for sustainable use. It also requires the identification of activities which have, or are likely to have, significant adverse impacts on the conservation and sustainable use of biological diversity, and monitor the effects of those activities.

'Biodiversity: The UK Action Plan' was published in January 1994 in response to Article 6 of the Convention. And a steering group was established to oversee the following tasks:

- developing costed targets for key species and habitats;
- suggesting ways of improving the accessibility and co-ordination of information on biodiversity;
- recommending ways of increasing public awareness and involvement in conserving biodiversity;
- recommending ways of ensuring that commitments in the Plan were properly monitored and carried out; and
- publishing findings before the end of 1995.

Each Plan details current status, current factors causing loss and decline, current action, action plan objectives and targets, and proposed action with lead agencies. Lead Agencies and Partners have been appointed for the Action Plans and these organisations are responsible for taking forward their implementation.

The UK Biodiversity Action Plan (UK BAP) is the Government's blueprint for wildlife conservation, setting out what action is required to protect and enhance wildlife under greatest threat. More than 400 individual plans for species and habitats provide the baselines against which future changes can be measured, and specific targets set. Air quality, water quality and quantity, energy, transport, and, above all, land-use are seen as the key areas for



**Figure 10 : National Marine Monitoring Programme, Phase II -
Environment Agency Benthic Sites - 2000**



**Figure 11 : National Marine Monitoring Programme, Phase II -
Environment Agency Trawling Sites - 2000**

improvement if wildlife is to thrive. The Countryside and Rights of Way Act 2000 provides a legal underpinning of the UK BAP. In addition, there is a DETR Public Service Agreement target that 95% of SSSIs in England should be in favourable conservation condition by 2010.

There are a number of levels of involvement in these action plans. For the maritime species and habitats, they are summarised in the categories below:

- Category 1. For a number of species and habitats we are the Government-appointed species contact point or lead agency for habitats - In the marine environment this is represented by coastal saltmarsh and mudflat habitats.
- Category 2. We are the Government appointed species lead partner – no marine species or habitats.
- Category 3. We are neither in 1 or 2, but have actions within the species or habitats action plan – all remaining species and habitats not in categories 1 or 4.
- Category 4. No specific action, but may play a peripheral role. – as for native oyster.

Specifically, under the UK BAP, there are 19 marine habitats and 31 marine species for which the Agency has a responsibility to ensure are protected through its own duties and powers. Appendix 10 highlights these species and habitats and summarises the current list of actions required by the Agency. The Agency is required to periodically provide information and expertise for reporting purposes in relation to specific actions drawn up in the plans to those with lead responsibility for individual habitat or species plans. This involves Agency staff being represented on a variety of external groups. The Agency is also required to take account of these habitats and species within its own plans and guidance and take action where appropriate to ensure species and habitats are protected e.g. Local Environment Action Plans, Shoreline Management Plans. Where these species or habitats may be affected by Agency activities then monitoring and assessment may be required e.g. coastal flood defence schemes.

3.4.13 Marine Algal Monitoring Programme

As a result of increasing concern over an apparent increase in algal blooms around the UK coastline, DETR, via the Marine Pollution Monitoring and Management Group requested the Agency's predecessor, the NRA, to implement monitoring of algal blooms in coastal waters. The Marine Algal Monitoring programme was built onto the existing Bathing waters sampling programme as an opportunistic and cost effective means of obtaining this information at most relevant sites. This was implemented in 1991 and has remained unchanged since its inception.

Monitoring at bathing water sites consists of two levels; a "Minimum Effort" programme where a sample is taken for algal analysis when a bloom is evident; and a "Best Endeavours" programme where a sample is taken for algal analysis each time a site is visited. Regions are also required to respond to ad-hoc requests for sampling at non- EC bathing water sites. The level of monitoring is decided within the Regions.

When specified toxic or potentially toxic algal species are identified this information is passed on to the Agency's National Centre for Ecotoxicology and Hazardous Substances as a Toxic Algal Bloom Report. These reports are forwarded to CEFAS, an executive Agency of MAFF. The local MAFF (now DEFRA) office and relevant Food Authority are then informed who carry out the necessary action to protect public health.

The data is also used to assess the extent of adverse effects from eutrophication and provides an early warning signal that an area may be susceptible to eutrophication. This data may be used to support or refute the sensitivity of a water body for designation as a Sensitive Area in respect of the UWWTD. However, the complex patterns of algal blooms in coastal waters also suggests that coastal sampling from beaches is not ideally suited to detecting algal blooms, particularly those responsible for paralytic and diarrhetic shellfish poisoning.

Recommendation 3.4.13:

The Marine Algal Monitoring Programme should be reviewed alongside UWWTD, OSPAR eutrophication strategy and Water Framework Directive with a view to establishing nationally consistent approach to algal monitoring in estuarine and coastal waters

3.4.14 Flood Defence

The Agency has a number of duties and powers in relation to flood defence which are described in more detail in the Frameworks for Change. More specifically in relation to tidal waters activity the Agency has permissive powers to operate, improve and maintain flood defences to mitigate flooding from rivers and the sea. It is this duty which most often involve tidal waters activities. DEFRA recently published guidance on the development of Shoreline Management Plans to provide a policy framework for these activities.

Flood Defence strategies in each Region often make recommendations for long term monitoring particularly in relation to capital schemes.

Shoreline Management Plans (SMPs)

A Shoreline Management Plan (SMP) aims to provide a vehicle for the long term, sustainable protection of our coastline. An SMP is a large scale assessment of the risks associated with coastal processes and presents a policy framework to reduce these risks to people and the developed, historic and natural environment in a sustainable manner. SMPs are voluntary and not back by any legal or statutory requirement

DEFRA have issued best practice guidance for the development of SMPs. The DEFRA guidance sets out the requirements for measurement and monitoring programmes and identifies key areas to be considered before embarking on such programmes as follows:

- *The nature of the coastline;* establish the nature of the coastal processes and the key features that could be measured or monitored. This should also provide an indication of the appropriate spacing of measurement points and frequency of recording.
- *The level of risk;* a preliminary appraisal of the current and likely future risks along a coastline will highlight the priority sites for monitoring programmes.
- *Setting objectives;* the objectives of the programme might range from keeping coastal changes under review, to updating predictions of coastal change, establishing a baseline condition or providing early warning.
- *Selection of technique;* the measurement techniques that are adopted need to reflect the programme objectives. For example, if the objective is to aid the updating of

predictions it is essential that the measurement techniques provide the correct type of information, measured at the appropriate frequency and spacing.

- *Shoreline form*: monitoring of the morphological and material changes that occur along a shoreline and the nearshore seabed. Techniques may include bathymetric and sediment surveys
- *Coastal processes*: monitoring the forcing factors causing coastal change. Techniques may include the use of wave rider buoys
- *Natural environment*: surveying habitat changes to establish a baseline and subsequent monitoring to quantify future changes against the baseline. Possible techniques include the use of aerial remote sensing:
- *Land use*: monitoring the nature and extent of new development in risk areas, through liaison with the local planning authorities.

3.4.15 Marine Environmental High Risk Areas (MEHRAs)

Marine Environmental High Risk Areas have been put forward as a result of recent oil spills in environmentally sensitive areas (specifically the "Braer" in 1993) and was the DETRs response to the need for greater management of shipping in such areas. A review has been conducted and stretches of coastline assessed for their sensitivity. Approximately 25 coastal stretches have been put forward as MEHRAs in the UK as a whole.

The Agency's duties stretch to 3 miles for the control of pollution and assessment water quality and is a key body in the management of oil and pollution incidents in inshore waters [no regulatory control over shipping pollution]. Oil spills occur relatively infrequently but when they do occur can lead to considerable Agency activity in tidal waters.

It has been suggested that monitoring of the MEHRAs will be carried out on a regular basis, and the findings will be assessed [one year after designation of the first MEHRAs][annually].

The Maritime and Coastguard Agency (MCA), through its Marine Offices, is considered well placed to monitor the effect both of designating sites as MEHRAs and of any protective measures introduced as a consequence of the designation of sites as MEHRAs. However, the EA may have a role to play in this. The monitoring proposals are currently under discussion.

3.4.16 Non-native Species Review

The control and prevention of non-native species invasion into the UK is currently being reviewed by DEFRA. The outcome of this review is not yet known but could lead to increased activity in tidal waters in relation to the Agencies statutory or mandatory duties. The most common example is the Chinese mitten crab, which if established in sufficient numbers can lead to destabilisation of estuary banks with consequent implications for Flood Defence. Less innocuous species are often found in routine biological surveys in tidal waters and more recently a possible non-native species, a sabellid polychaete worm, has been found in the Tees estuary during routine biological monitoring. The Agency will undoubtedly need to make available information from its routine monitoring activities where such incidences are encountered.

Recommendation 3.4.16

All marine biological data collected as part of routine biological monitoring programmes should be held at a central location and periodically updated to allow early warnings of the occurrence and spread of non-native species.

3.4.17 Conservancy and Navigation

In some Regions (Welsh and Southern) the Agency has inherited statutory conservancy duties for defined tidal waters.

3.4.18 Integrated Pollution Prevention and Control - Authorisations

IPPC staff undertakes periodic reviews of authorisations. In general there is no consistent guidance or co-ordination to ensure that general marine environmental issues are considered during authorisation reviews or for any new authorisations. In some regions more formal arrangements exist for consultation between Water Management and Environmental Protection to ensure that all potential environmental impacts are considered particularly in relation to water quality. In addition, there is formal national procedural guidance to ensure that IPPC authorisations are reviewed in relation to the Habitats Directive requirements.

Recommendation:

Consistent national guidance is developed for reviewing authorisations which relate to the marine environment.

3.4.19 Pollution Incident Response

Periodically marine expertise is required in relation to pollution incident response. There are no set requirements for such responses since each incident tends to be unique. Pollution incidents in the marine environment are often much more difficult to define than in fresh waters due to the dispersive nature of the environment. Local knowledge and expertise are particularly important in this context. Often communication links exist with local groups, which facilitate more targeted investigation.

3.4.20 Operational

A number of Regions have an element of tidal waters activity which is entirely for area and regional operational purposes.

The following categories are described in the Agency's monitoring manual and are usually cited as the drivers for this type of activity:

Discharge Impact Assessment, Pre-consenting Studies and Post Scheme Appraisal

This category covers monitoring investigations related to point source discharges and the assessment of their environmental impact. The objectives of this type of survey are to assess the likely environmental impact prior to issuing a consent or authorisation in order to set appropriate limits and then review these conditions to ensure they are protecting the aquatic environment. This type of work is fundamental to the way the Agency operates to protect the aquatic environment.

Development Impact Assessment

This category includes environmental impact assessments associated with developments in fresh and marine waters and covers, for example, opencast mining; industrial and urban developments and tidal barrages.

Detection of Trends and General WQ Characterisation

This type of assessment is often not targeted at resolving water quality problems or issues. This category includes investigations to determine background water quality and changes in water quality over time. In order to be included in Regional Operational monitoring, sampling in this category must be justified in terms of solving or identifying a particular water quality problem or issue.

For freshwaters, it is expected that the number of instances when work of this type, above that required for the GQA, is undertaken by the Regions will be small. However, this type of monitoring will be required where the determinands of interest are outside the scope of statutory or surveillance monitoring programmes. Since estuaries and coastal waters are often outside the scope of such monitoring e.g. GQA this may be a significant element of regional activities in tidal waters.

R & D and ROI

This category covers the survey work undertaken by the Regions in support of National R&D initiatives and Regional investigative or development work.

Examples of national projects are the Estuary Classification Scheme: Benthic Invertebrate Component and regional Habitats Directive. Regional projects will reflect particular local problems or issues.

Defensive Studies

In some cases Regions may undertake sampling in connection with particular local issues which come to the fore and which may be championed by local pressure groups or attract media attention with the possibility of the Agency's position being challenged. This category involves the collection of information to allow the Agency to form an opinion and respond to the issue based on scientific data. Issues like this are often brought to attention through Local Environment Action Plans (LEAPs) though to date only one Area in NE Region has published a LEAP which focuses exclusively on the coastal zone.

Post Pollution Incidents

This category does not intend to include Formal, or other, sampling which is undertaken as part of the initial response to a pollution incident. It is intended to cover the sampling that is undertaken after the incident is over and includes work to monitor the recovery of the controlled water and surveys to indicate the extent of remedial work required to assist in drawing up pollution prevention initiatives. A good example of this is work following the Sea Empress oil spill in the Environment Agency Wales.

'Real time' Water Quality Management

This category is restricted to the day-to-day management of estuaries through the use of continuous monitoring instruments, such as the system for the management of the Thames estuary and the future operation of barrages, e.g.: Tees; Tawe; and, Cardiff Bay barrages.

Model Development, Calibration and Validation

This category covers monitoring undertaken in the development, calibration and validation of water quality models which will be used to assist management decisions for the protection of the aquatic environment. The output from models is used to support other identified justifiable categories, notably discharge impact assessment and the detection of trends and general water quality characterisation.

3.4.21 Fisheries

The following drivers exist for fisheries in tidal waters:

- Sea Fisheries Act 1966
- Local Sea Fishery Byelaws
- Bass Nursery Area and Size Limit Byelaws
- Salmon and freshwaters fisheries Act 1975
- Local salmon and sea trout byelaws
- Eel fishing byelaws
- Salmon Management Strategy
- National Byelaws to protect spring salmon
- Salmon Action Plans
- Fisheries Legislative Review

In the main the drivers above are legislative controls for commercial fishing and lead to a variety of enforcement activity in the regions primarily salmonids, eels and bass.

The Salmon and Freshwaters Fisheries Act covers more than just enforcement activities as it gives the Agency fisheries department power to maintain, improve and develop fisheries. In some cases the passage of migratory fish through estuaries has lead to difficulties due to water quality problems particularly in recovering estuaries such as the Tyne, Thames, Humber and Mersey. Large recovering estuaries are also beginning to provide new nursery grounds for sea fish which have wider UK significance. For example the Thames estuary below Greenwich has become the largest new Sole nursery in the UK within the past two decades. This trend is likely to continue and with it the need to ensure an active management role from the Agency's fisheries department.

Problems with fish migration and the need to manage nursery grounds have lead to operational investigations and water quality monitoring to assess the prevailing conditions in some estuaries. Such investigations can usually be categorised using the operational investigation categories outlined above. A good example of this is the introduction of continuous dissolved oxygen monitors to assess prevailing conditions in an estuary following regulatory control of discharges. This type of data is also often used for model validation to assess varying management regimes in relation to further controls to ensure the passage of migratory fish throughout the year and at all tidal states.

The Water Framework will require an assessment of fish communities in transitional waters. An R & D project looking at the development of a classification scheme for estuarine fish communities is currently underway in Thames Region.

4 CONCLUSIONS AND RECOMMENDATIONS

The total investment by the Agency in tidal water activities is in the order of £5M per annum, making it by far the biggest single participant in the assessment and management of estuarine and coastal waters in England and Wales.

Despite its status as a key operator in tidal waters there is no central focus for its activities in this area, with tidal water activities being diffused throughout all functions and a lack of communication is evident between Areas, Regions and Functions in this regard. This weakness in the organisation has been identified by several groups but has yet to be seriously addressed.

Because of this lack of focus, some elements of tidal water programmes have been created as adjuncts to freshwater programmes and are consequently not as technically and scientifically robust as they could be.

Looking cross-functionally at the organisation as a whole, there are differences apparent in the approaches adopted by Regions in the type and quantity of work that they undertake which are inexplicable at the level at which this review was performed.

Recommendation 2.1

To facilitate communication and integration a group similar to the NE Region Tidal Water review Group should be identified in each Region and organisational structure charts produced to indicate responsibilities for, for example, NMMP.

Recommendation 2.3

Where differences of approach, scale and method of delivery are identified in Regional Water Quality programmes between Regions these should be investigated with a view to improving consistency.

Recommendation 2.4.1

The reasons for the big variation in Water Quality sampling programmes between Regions should be investigated and best practice identified and applied across the whole organisation.

Recommendation 2.4.2

Biological programmes in Regions need to be assessed against the definitive list of drivers identified in Section 3 below and differences in emphasis and approach investigated and, if necessary, redressed.

Recommendation 2.4.3

Current arrangements for macroinvertebrate analysis should be examined for cost effectiveness and other options for the delivery of this work evaluated.

Recommendation 2.5

Regional use of small vessels should be reviewed to ensure best practice and cost effectiveness

Recommendation 3.4.1

Timetables for the Water Framework Directive are clearly stated to ensure developments in tidal waters meet the needs of the Directive.

The need for policy, strategic and technical development of the Directive is acknowledged and appropriately resourced to ensure appropriate development of WFD in tidal waters.

Recommendations 3.4.2

Consideration is given to a reduction in the frequency of environmental monitoring at some sites for the purposes of the Dangerous Substances Directive.

The guidance is reviewed to provide more prescriptive, technically justifiable and cost effective monitoring to ensure a consistent approach to the environmental monitoring in the future.

Recommendation 3.4.5

A clear strategy, methodology and monitoring programme is agreed for the Regions for 2002 – 2005 for the assessment of eutrophication in tidal waters to ensure a robust defensible approach to SA assessment.

Consideration is given to the inclusion of OSPAR requirements within the existing UWWTD monitoring programmes (see OSPAR below).

Recommendation 3.4.7

Data collected in 2000-01 is reviewed on a site by site basis and future monitoring requirements determined from this review. This review will allow the scale of the future programme to be determined. The review should also take into account results for the Shellfish Hygiene Directive.

Recommendation 3.4.8

A strategic overview of technical requirements for Habitat Directive in tidal waters, considered with the requirements of other statutory drivers or international obligations. Consideration should be given to the specialist skills needed within the Agency for the delivery of these projects.

Recommendation 3.4.10.1

The assessment needs and monitoring requirements for coastal waters for the Urban Waste Water and Nitrates Directive and OSPAR eutrophication strategy should be reviewed with a view to merging the monitoring requirements.

Recommendation: 3.4.10.2

The environmental monitoring programme for radioactive substances is compared to the environmental monitoring programme for dangerous substances and where overlap occurs consideration is given to merging the sampling activities since the same media are sampled using similar sampling methods.

Recommendation 3.4.16

All marine biological data collected as part of routine biological monitoring programmes should be held at a central location and periodically updated to allow early warnings of the occurrence and spread of non-native species.

Appendix 1 - The "What is Going on in the Coastal Zone" questionnaire



- WHAT GOES ON IN THE COASTAL* ZONE?

(*INCLUDES ESTUARIES)

NAME:		REGION:		FUNCTION:	
DEPT:		JOB TITLE:			

TEAM COVERED BY THIS FORM: (eg N. Area Anglian Biology, SW Fisheries)

SECTION 1: COASTAL ZONE ACTIVITIES that your Team are involved in. Please tick appropriate boxes and add other activities in space on the right hand side or at the end of the section.

IN COASTAL* ZONE ONLY	Major Role	Minor Role	Others (please state)
(Includes estuaries)			
Strategic Planning	<input type="checkbox"/>	<input type="checkbox"/>	
Flood Warning	<input type="checkbox"/>	<input type="checkbox"/>	
Flood Defence Schemes			
Construction	<input type="checkbox"/>	<input type="checkbox"/>	
Consultation	<input type="checkbox"/>	<input type="checkbox"/>	
Surveys			
eg. Shoreline	<input type="checkbox"/>	<input type="checkbox"/>	
Submerged Areas (Boat use)	<input type="checkbox"/>	<input type="checkbox"/>	
Fisheries	<input type="checkbox"/>	<input type="checkbox"/>	
Bathymetry /Beach Profiling	<input type="checkbox"/>	<input type="checkbox"/>	
Aerial Mapping	<input type="checkbox"/>	<input type="checkbox"/>	
External Consultations			
eg. Planning Applications	<input type="checkbox"/>	<input type="checkbox"/>	
Land Drainage Consents	<input type="checkbox"/>	<input type="checkbox"/>	
Discharge Consents	<input type="checkbox"/>	<input type="checkbox"/>	
Abstraction Licences	<input type="checkbox"/>	<input type="checkbox"/>	
Monitoring			
eg. Biological	<input type="checkbox"/>	<input type="checkbox"/>	
Chemical	<input type="checkbox"/>	<input type="checkbox"/>	
Physical	<input type="checkbox"/>	<input type="checkbox"/>	
Reactive Monitoring	<input type="checkbox"/>	<input type="checkbox"/>	
Enforcement	<input type="checkbox"/>	<input type="checkbox"/>	
Incident Response			
eg Oil Spill	<input type="checkbox"/>	<input type="checkbox"/>	

IN COASTAL ZONE ONLY (Includes estuaries)	Major Role	Minor Role	Others (please state)
Navigation / Harbour Duties	<input type="checkbox"/>	<input type="checkbox"/>	
Boat Operations	<input type="checkbox"/>	<input type="checkbox"/>	
Data Review	<input type="checkbox"/>	<input type="checkbox"/>	
Modelling/Model Validation	<input type="checkbox"/>	<input type="checkbox"/>	
Research and Development Projects	<input type="checkbox"/>	<input type="checkbox"/>	
OTHER activities			

SECTION 2: PLANS/SCHEMES AND GROUPS/ORGANISATIONS FOR THE COASTAL ZONE that your Team are involved in/with. Please tick appropriate boxes and add other plans/schemes/organisations in space on the right hand side or at the end of the section.

IN COASTAL ZONE ONLY (Includes estuaries)	Major Role	Minor Role	Others (please state)
EA Sections			
Flood Defence	<input type="checkbox"/>	<input type="checkbox"/>	
Fisheries	<input type="checkbox"/>	<input type="checkbox"/>	
Recreation and Navigation	<input type="checkbox"/>	<input type="checkbox"/>	
Conservation	<input type="checkbox"/>	<input type="checkbox"/>	
Ecology	<input type="checkbox"/>	<input type="checkbox"/>	
Environmental Impact Assessment	<input type="checkbox"/>	<input type="checkbox"/>	
Radioactive Substances Regulation	<input type="checkbox"/>	<input type="checkbox"/>	
Water Quality	<input type="checkbox"/>	<input type="checkbox"/>	
Process Industries Regulation	<input type="checkbox"/>	<input type="checkbox"/>	
Waste Management & Regulation	<input type="checkbox"/>	<input type="checkbox"/>	
Water Resources	<input type="checkbox"/>	<input type="checkbox"/>	
National Centres			
Ecotoxicity & Hazardous Substances	<input type="checkbox"/>	<input type="checkbox"/>	
Environmental Data & Surveillance	<input type="checkbox"/>	<input type="checkbox"/>	
Flood Warning	<input type="checkbox"/>	<input type="checkbox"/>	
Risk Assessments	<input type="checkbox"/>	<input type="checkbox"/>	
Salmon and Trout Fisheries	<input type="checkbox"/>	<input type="checkbox"/>	

IN COASTAL ZONE ONLY (Includes estuaries)	Major Role	Minor Role	Others (please state)
National Services			
National Marine Service	<input type="checkbox"/>	<input type="checkbox"/>	
National Laboratory Service	<input type="checkbox"/>	<input type="checkbox"/>	
National Technical Groups			
eg. Marine Biology Technical Group	<input type="checkbox"/>	<input type="checkbox"/>	
Estuary Classification Group	<input type="checkbox"/>	<input type="checkbox"/>	
Conservation Technical Group	<input type="checkbox"/>	<input type="checkbox"/>	
Fisheries Protection Group	<input type="checkbox"/>	<input type="checkbox"/>	
Bathing Water and Shellfish Water Task and Finish Group	<input type="checkbox"/>	<input type="checkbox"/>	
Water Framework Directive	<input type="checkbox"/>	<input type="checkbox"/>	
Local Environment Agency Plans			
<input type="checkbox"/>	<input type="checkbox"/>		
Land Use Planning and Development Control			
eg. Statutory Development Plans	<input type="checkbox"/>	<input type="checkbox"/>	
Statutory District Local Plans	<input type="checkbox"/>	<input type="checkbox"/>	
Shoreline Management			
eg. Shoreline Management Plans	<input type="checkbox"/>	<input type="checkbox"/>	
Strategy Plans	<input type="checkbox"/>	<input type="checkbox"/>	
Project Appraisal Reports	<input type="checkbox"/>	<input type="checkbox"/>	
Government Organisations			
eg. Dept. of the Environment, Food and Rural Affairs	<input type="checkbox"/>	<input type="checkbox"/>	
Environment & Heritage Service	<input type="checkbox"/>	<input type="checkbox"/>	
National Assembly of Wales	<input type="checkbox"/>	<input type="checkbox"/>	
Government Office	<input type="checkbox"/>	<input type="checkbox"/>	
Centre for Environment, Fisheries and Aquaculture Science	<input type="checkbox"/>	<input type="checkbox"/>	
Scottish Environment Protection Agency	<input type="checkbox"/>	<input type="checkbox"/>	
Scottish Fisheries Protection Agency	<input type="checkbox"/>	<input type="checkbox"/>	
Joint Nature Conservation Committee	<input type="checkbox"/>	<input type="checkbox"/>	
Countryside Council for Wales	<input type="checkbox"/>	<input type="checkbox"/>	
English Nature	<input type="checkbox"/>	<input type="checkbox"/>	
English Heritage	<input type="checkbox"/>	<input type="checkbox"/>	
Maritime and Coastguard Agency	<input type="checkbox"/>	<input type="checkbox"/>	

IN COASTAL ZONE ONLY (Includes estuaries)	Major Role	Minor Role	Others (please state)
Local Government			
eg. Local Authority	<input type="checkbox"/>	<input type="checkbox"/>	
County Council	<input type="checkbox"/>	<input type="checkbox"/>	
Crown Estates	<input type="checkbox"/>	<input type="checkbox"/>	
Local Development Action Plans	<input type="checkbox"/>	<input type="checkbox"/>	
Regional Development Agencies	<input type="checkbox"/>	<input type="checkbox"/>	
Regional Assemblies	<input type="checkbox"/>	<input type="checkbox"/>	
European Union			
eg. European Environment Agency	<input type="checkbox"/>	<input type="checkbox"/>	
European Spatial Development Plans	<input type="checkbox"/>	<input type="checkbox"/>	
Water Framework Directive	<input type="checkbox"/>	<input type="checkbox"/>	
Oslo & Paris Convention	<input type="checkbox"/>	<input type="checkbox"/>	
International Council for the Exploration of the Seas	<input type="checkbox"/>	<input type="checkbox"/>	
Research			
Universities	<input type="checkbox"/>	<input type="checkbox"/>	
Research Institutes	<input type="checkbox"/>	<input type="checkbox"/>	
Teams involving external groups			
eg. UK Technical Advisory Groups (please specify which)	<input type="checkbox"/>	<input type="checkbox"/>	
National Shoreline Management Advisory Service	<input type="checkbox"/>	<input type="checkbox"/>	
Coastal Advisory Groups	<input type="checkbox"/>	<input type="checkbox"/>	
Estuary Management Plans	<input type="checkbox"/>	<input type="checkbox"/>	
Harbour Management Plans	<input type="checkbox"/>	<input type="checkbox"/>	
Coastal Zone Management Plans	<input type="checkbox"/>	<input type="checkbox"/>	
Coastal Habitat Management Plans	<input type="checkbox"/>	<input type="checkbox"/>	
Management Schemes for European Sites	<input type="checkbox"/>	<input type="checkbox"/>	
Habitat and Species Action Plans	<input type="checkbox"/>	<input type="checkbox"/>	
Local Biodiversity Action Plans	<input type="checkbox"/>	<input type="checkbox"/>	
Water Level Management Plans	<input type="checkbox"/>	<input type="checkbox"/>	
National Marine Monitoring Programme working group	<input type="checkbox"/>	<input type="checkbox"/>	
Marine Pollution Monitoring Management Group	<input type="checkbox"/>	<input type="checkbox"/>	
National Marine Analytical Control Groups	<input type="checkbox"/>	<input type="checkbox"/>	

IN COASTAL ZONE ONLY**(Includes estuaries)**Major
RoleMinor
Role

Others (please state)

**Teams involving outside representatives
(cont.)**

Thames Estuary Partnership

☐☐

Solent Forum

☐☐

Humber Strategy

☐☐

Wash Forum

☐☐

Irish Sea Forum

☐☐Partnership of Irish Sea Coastal and
Estuary Strategies☐☐

Morecombe Bay Forum

☐☐

Mersey Basin Campaign

☐☐**Port Authorities**☐☐

(Please name)

Industry Facing Groups

eg. National Farmers Union

☐☐

Countryside Landowners Association

☐☐

Confederation of British Industry

☐☐

Chemical Industries Association

☐☐**Charitable Organisations**

eg. RSPB

☐☐

Wildlife Trusts

☐☐

Local Interest/Action Groups

☐☐

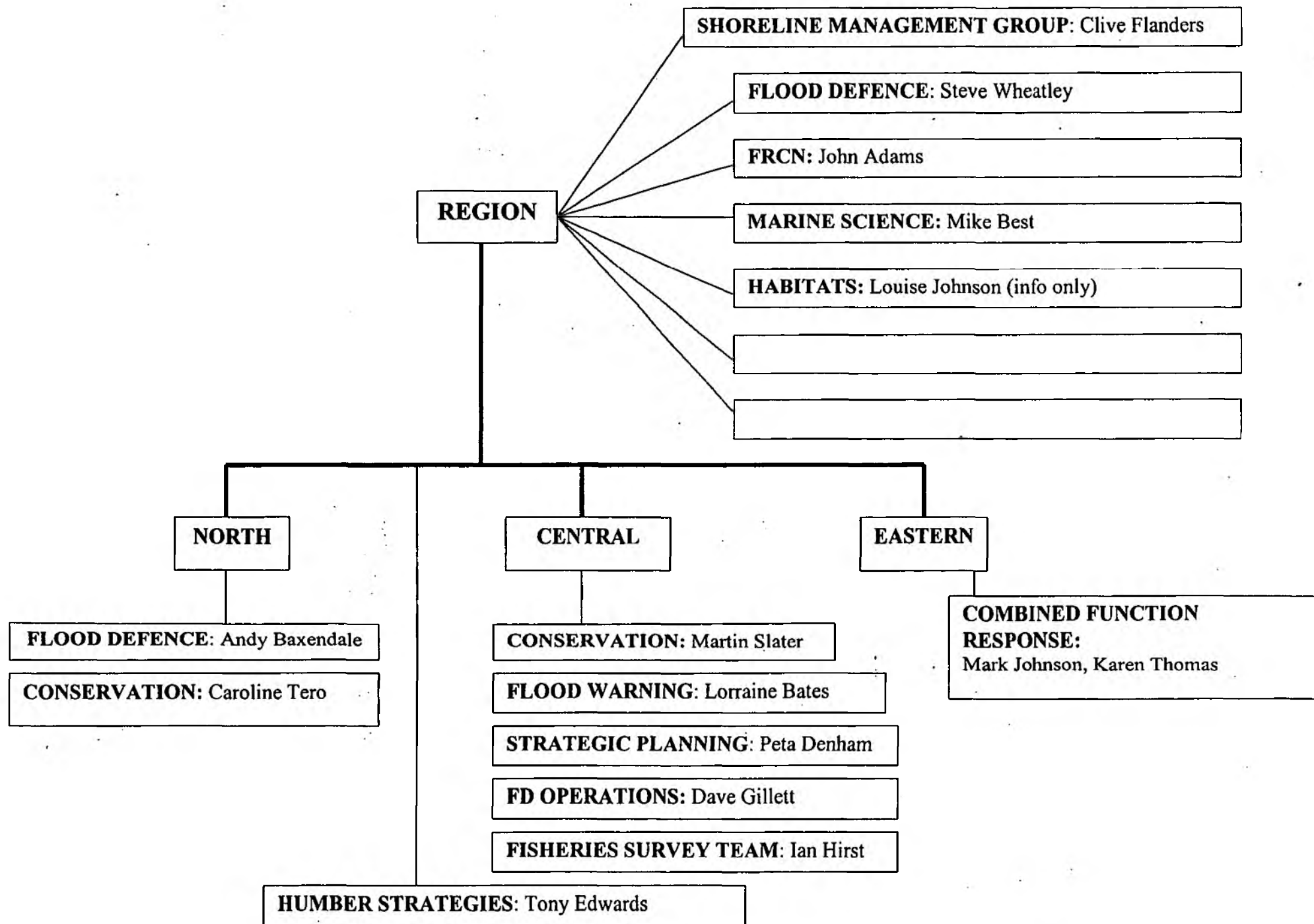
Environmental Lobby Groups

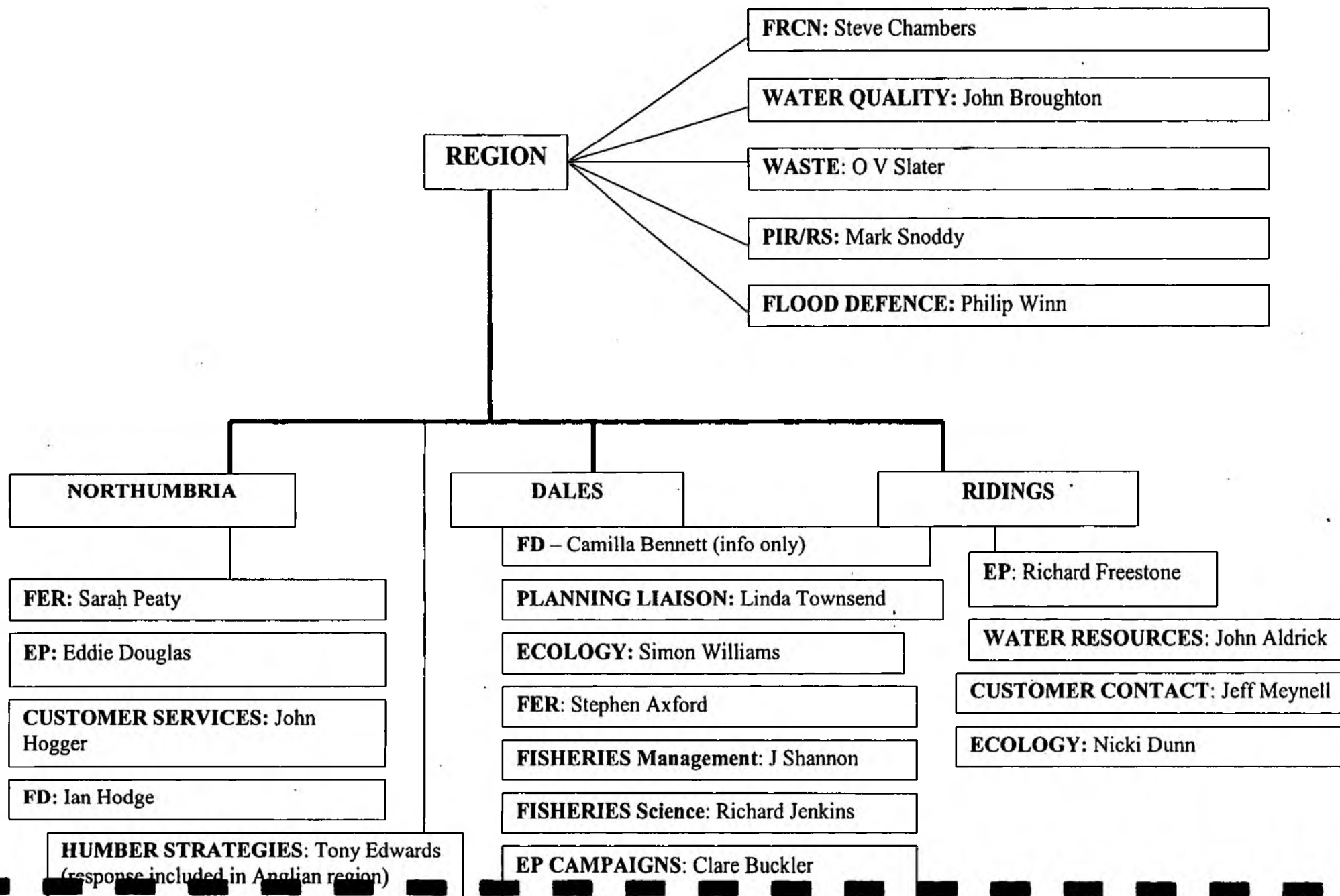
☐☐

National Trust

☐☐**OTHERS**

Appendix 2 - Groups and organisations identified from the "What goes on in the coastal zone" questionnaire.

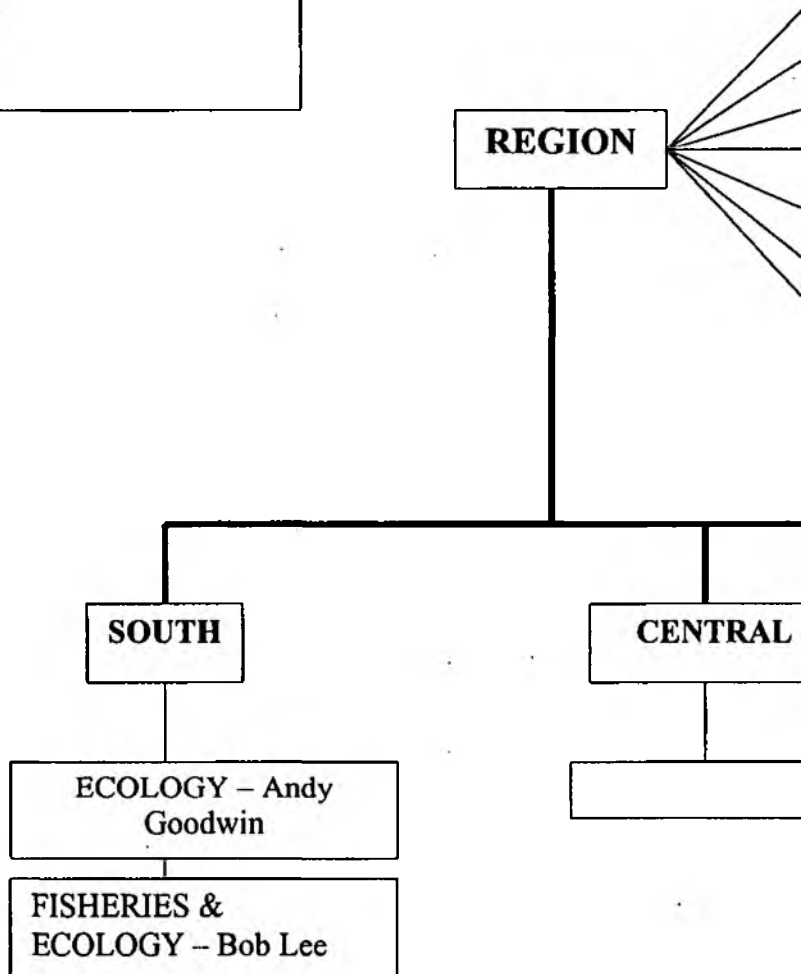




NW – HIGH LEVEL SUMMARY

NO INVOLVEMENT

PIR – Ian Haskell



DATE:

FRCN – Mark Diamond

MARINE & SPECIAL PROJECTS – Michael Weston

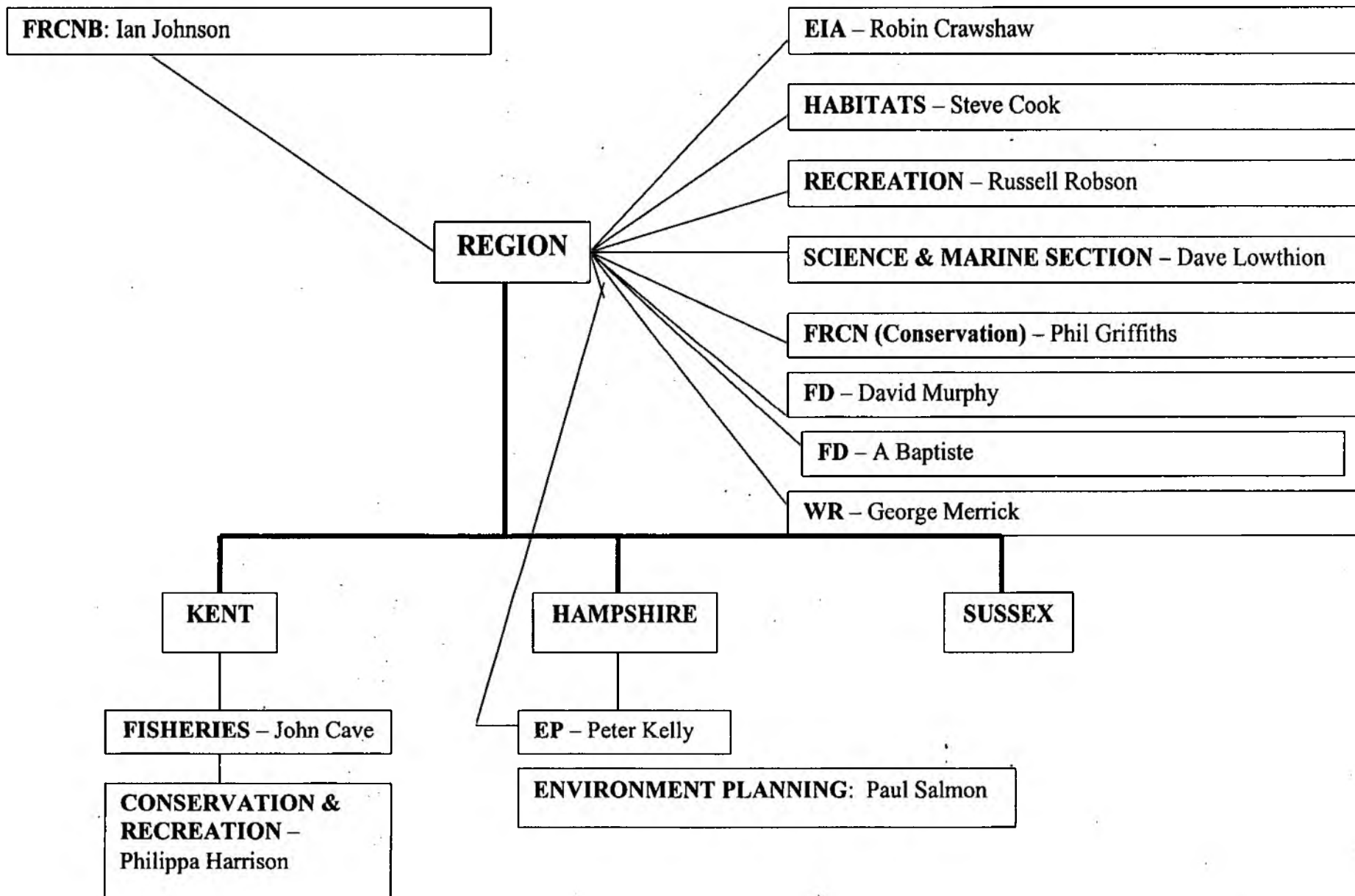
INCIDENT & EMERGENCY TEAM – Steve Smith

FLOOD DEFENCE – Paul Stainer

HABITATS – Sarah Peet (info only)

EIA & ECOLOGY – Karen Williams

NORTH



SW – HIGH LEVEL SUMMARY

NO INVOLVEMENT

REGION

CORNWALL

DEVON

**HABITATS/FER – Jess
Pennington**

DATE:

FISHERIES – Stuart Bray

HABITATS – Sacha Rogers (only info)

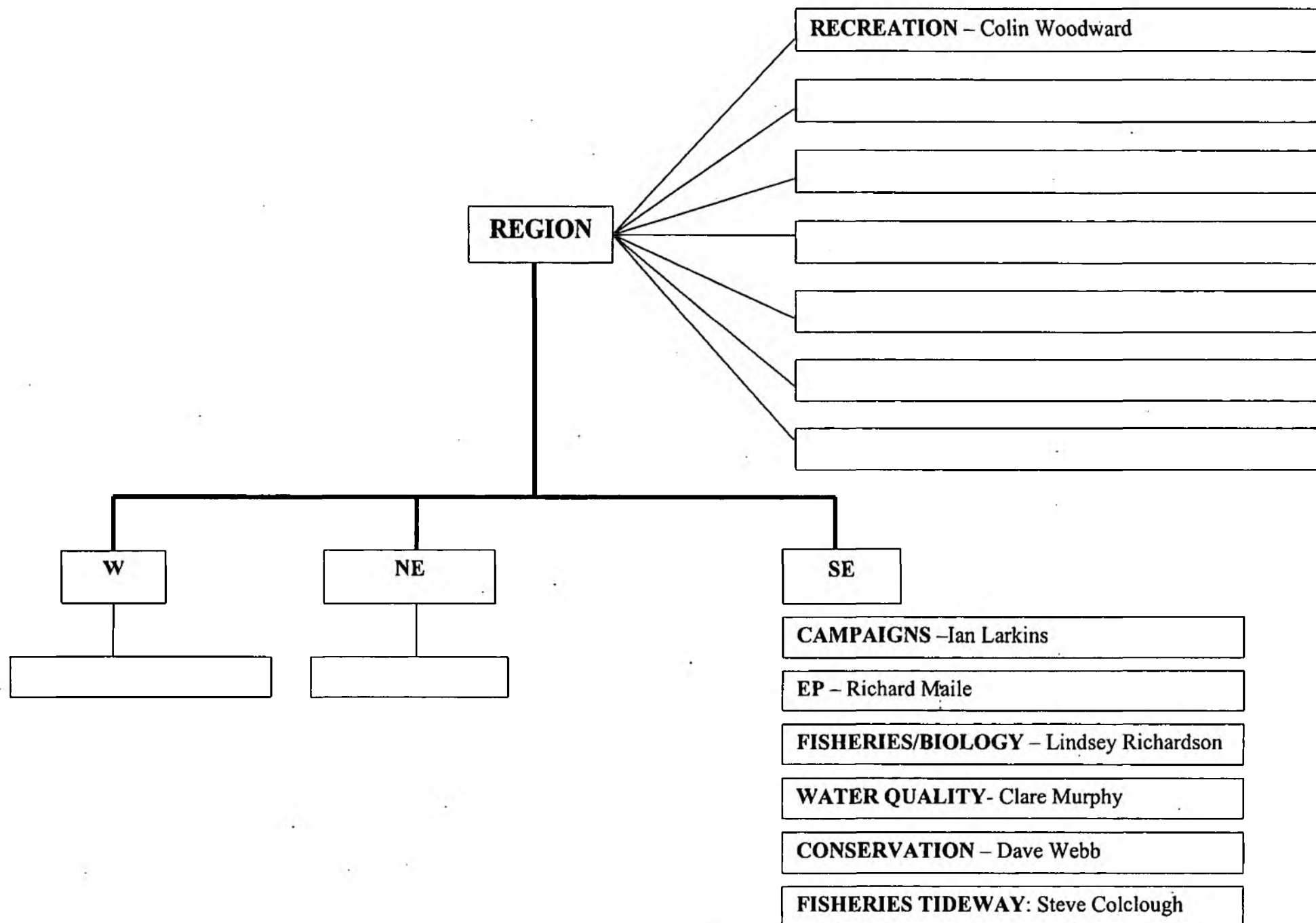
FLOOD DEFENCE – Carol Drummond

REIT – Rich Walmsley

FRCN – Lyn Jenkins

NORTH WESSEX

SOUTH WESSEX



NO INVOLVEMENT

REGION

NORTH

EP: Andrew Dixon

FER: Alan Winstone

**ENVIRONMENTAL
PLANNING:** Martin Cox

TACTICAL PLANNING:
Rob Thomas

SOUTH EAST

EAT: Peter Gough

CUSTOMER CONTACT: Dave Andrews

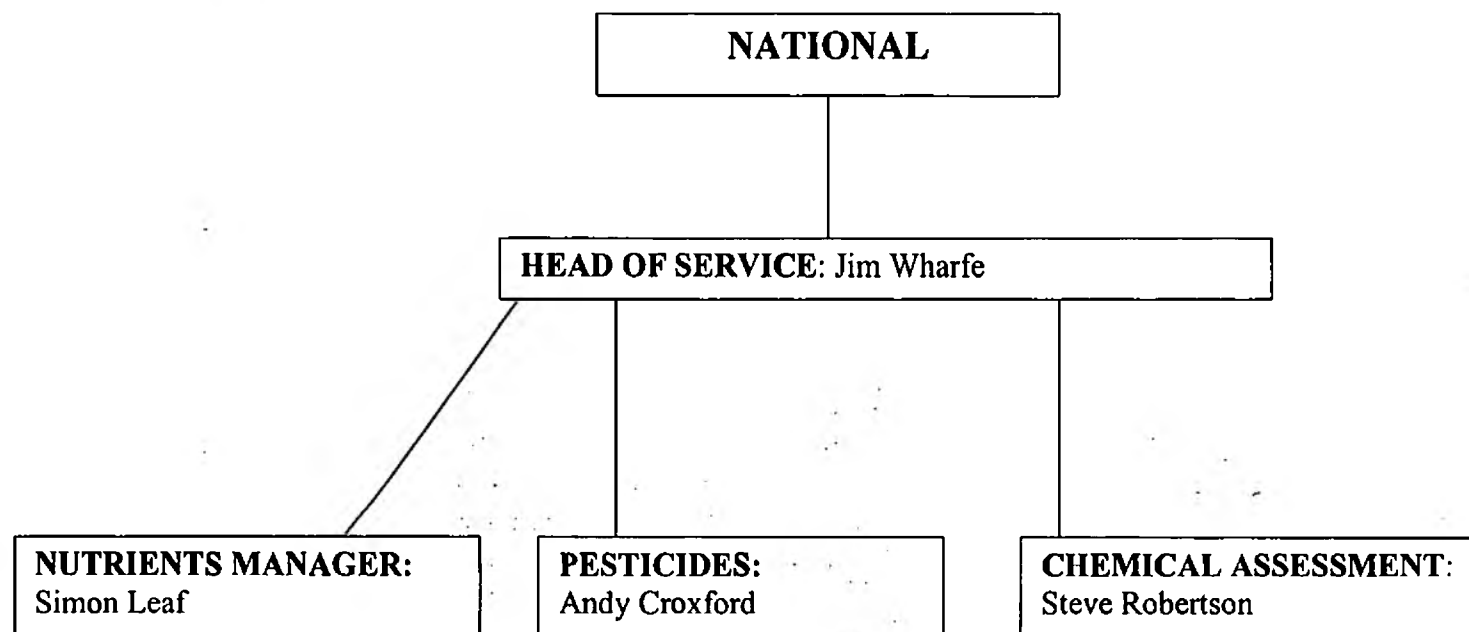
ENVIRONMENT PLANNING: M J Mills

ENVIRONMENT PROTECTION: John Tomala
(John Harrison)

SOUTH-WEST

ENVIRONMENT PLANNING: Daron Herbert

PROGRAMME COORDINATION: Bob Phillips



NATIONAL

HEAD OF SERVICE: Dave Palmer

OCEANOGRAPHER: Tim Sawyer

NATIONAL

HEAD OF SERVICE: Jimi Irwin

ENVIRONMENTAL FORECASTING:
Robert Willows

National Centre: Flood Warning

NATIONAL

HEAD OF SERVICE: Jim Haywood

DATE:

NATIONAL

HEAD OF SERVICE: John Orr

QUALITY ASSURANCE: Roger Proudfoot

BOAT OPERATIONS: Chris Ashcroft

Appendix 3 - Internal and external working groups and organisations with tidal waters interests.

INTERNAL AND EXTERNAL GROUPS INVOLVED WITH TIDAL WATER ACTIVITIES

NATIONAL TECHNICAL GROUPS

Marine Biology Technical Group
Estuary Classification Group
Conservation Technical Group
Fisheries Protection Group
Bathing Water and Shellfish Water Task and Finish Group
Water Framework Directive
Aquatic Eutrophication Strategy Group
National Algal Contacts Group

NATIONAL CENTRES

Ecotoxicity & Hazardous Substances
Environmental Data & Surveillance
Flood Warning
Risk Assessments
Salmon and Trout Fisheries

GOVERNMENT ORGANISATIONS

Dept of the Environment, Food and Rural Affairs
Environment & Heritage Service
National Assembly of Wales
Government Office
Centre for Environment, Fisheries and Aquaculture Science
Scottish Environment Protection Agency
Scottish Fisheries Protection Agency
Joint Nature Conservation Committee
Countryside Council for Wales
English Nature
English Heritage
Maritime and Coastguard Agency
Countryside Agency
British Waterways

LOCAL GOVERNMENT

Local Authority
County Council
Crown Estates
Local Development Action Plans
Regional Development Agencies
Regional Assemblies

TEAMS INVOLVING EXTERNAL GROUPS

National Governing Bodies for Sport
UK Technical Advisory Groups
National Shoreline Management Advisory Service
Coastal Advisory Groups
Estuary Management Plans
Harbour Management Plans
Coastal Zone Management Plans
Coastal Habitat Management Plans
Management Schemes for European Sites
Habitat and Species Action Plans
Local Biodiversity Action Plans
Water Level Management Plans
National Marine Monitoring Programme Working Group
Marine Pollution Monitoring Management Group
National Marine Analytical Control Groups
Westminster Boating Base?
Thames Port London Monitoring Group?
Thames Boat Projects – Richmond *****?
Proposed Kew to Chelsea Landscape Strategy?
Hampton to Kew Landscape Strategy?
River User Group of Teddington to Tower Bridge?
Port of London Liaison Forum?
London Walking Forum?
Marine SAC Relevant Authority Groups
National Governing Bodies for Sport

Solent Emergency Plan
National Marine Strategy Group
Westminster Boating Bas

TEAMS INVOLVING OUTSIDE REPRESENTATIVES

Shellhaven Development
Thames Estuary Partnership
Solent Forum
Humber Strategy
Humber Estuary Partnership
Wash Forum
Irish Sea Forum
Flamborough Head Management Scheme
Heritage Coast Partnership (Spurn & Flamborough)
Partnership of Irish Sea Coastal and Estuary Strategies
Morecombe Bay Forum
Mersey Basin Campaign
Shellfish Liaison Groups
ADUR Watersports Development Group
Solent Water Quality Con
Medway & Swale Estuary Partnership
North West Coastal Group
Liverpool Bay Coastal Group
Tidal Dee Users Group
Ribble Estuary Partnership
NW Coastal Forum
Cell II
Tamar Estuaries Consultative Forum
Fal Bay & Estuaries Initiative
Essex Estuaries Initiative
Stour/Orwell Forum
Severn Estuary Group
Thames Explorer Trust

INDUSTRY FACING GROUPS

Sea Fisheries Authority
National Farmers Union
Country Landowners Association
Confederation of British Industry
Chemical Industries Association
MAFF (FWAG)

CHARITABLE ORGANISATIONS

RSPB
British Trust for Ornithology
Wildlife Trusts
Local Interest/Action Groups
Environmental Lobby Groups
National Trust
Tenby Campaign for Clean Seas

Appendix 4 - National Resource Estimates for Environment Agency Tidal Water Activities in
2001/02

Table 1. National resource estimates for Environment Agency Tidal Water Activities in 2001/02

Drivers	Monitoring Requirement	Frequency	Number of Sites	Total annual cost (£k)	Sampling and analysis (£k)	Reporting and mgmt (£k)	How often is the data reported	Sampling methods	Comments	Means of calculation
Titanium Dioxide Directive	Benthic macrofauna, bioaccumulation (representative species), presence of morbid anatomical lesions in fish, sediments and water chemistry (Tioxide suite)	Biology 1 p.a., water 3 p.a.	16 water 37 sediments (macrobenthos, chemistry) 5 bioaccumulation	44	40	4	Annually	EA National Sampling Procedures Manual and Marine Procedures Manual	NE and Anglian Region only, regionally defined strategy.	NMS Budget provision and MBTG priority planning file for 2000
National Marine Monitoring Programme	Benthic macrofauna, bioaccumulation (fish, mussels and algae), sediment chemistry (NMMP Suite), water chemistry (local requirements for List I & II), oyster embryo larvae (OEL)	1 p.a. except water chemistry and OEL 4 p.a.	40	389	342	47	3 years	Green Book		NMMP efficiency review data for sampling activities and some biological analyses, plus head office figures for NLS.
Dangerous Substances Directive	Sediment chemistry and / or bioaccumulation (resident biota), water chemistry (List I & II)	Varies from quarterly to monthly for water, annually for biota and sediments	307 List I, 242 List II (mostly water chemistry but some sediment and biota included)	420	400	20	Annually	National Sampling Procedures and Marine Procedures manual	"Standstill" provision for List I substances liable to accumulation in sediments or biota (Mercury has an actual value).	Costs provided are approximate only based on NMS budget and extrapolated to inc additional 25% not undertaken by NMS.
Urban Waste Water and Nitrates Directive (Designated Sensitive Areas)	Phytoplankton, macroalgae, water chemistry (nutrients and supporting determinands)	Winter nutrients and summer phytoplankton / macroalgae	19 sites	52	47	5	Annually	National Sampling Procedures and Marine Procedures manual	Includes existing designated Sensitive Areas (5), candidate SAs being assessed and coastal ex -	Figures derived from head office returns to MPMMG review
Urban Waste Water and Nitrates Directive (Candidate Sensitive Areas)	Phytoplankton, macroalgae, water chemistry (nutrients and supporting determinands)	Monthly winter nutrients and summer phytoplankton / macroalgae	4 embayments, 15 estuaries, 23 coastal locations	350	300	50	Every four years	National Sampling Procedures and Marine Procedures Manual		Figures derived from NMS budget and programme
Shellfish Waters Directive	Bacteriology, water chemistry	12	119 sites	220	210	10	Annually	National Sampling Procedures Manual		Figures derived from NMS budget and programme with additional element for laboratory analyses (calculated @ 12 x site x cost of sample analysis with contractor)

Chloro-alkali Directive	Water and sediment chemistry	Once p.a.	13	2.5	2	0.5	Annually	National Sampling Procedures Manual	Only undertaken in NW Region	Figures derived from NMS programme
Nuisance Marine Algae Monitoring	Phytoplankton, chlorophyll a	Summer months	Designated bathing waters	9.5	7.5	2	Annually	Marine Procedures Manual (procedures in relation to plankton in prep)	Best endeavours and Minimum Effort Phytoplankton Monitoring carried out alongside Bathing Waters Directive sampling	Fieldwork at no extra costs, reporting determined as 20 days at the equivalent for priority planning, analysis costs determined from MBTG priority planning data 2000 though not all effort accounted for
NWC Estuary Classification	Macroinvertebrate community, fish community, bioaccumulation	5 yearly	179 estuaries	-	-	-			Inconsistent between regions. To be superseded by Water Framework Directive from	Inconsistent between regions. To be superseded by Water Framework Directive from 2001.
Habitats Directive	Operational investigations to support review of consents in relation to designated habitats within SACs/SPAs. Projects vary but predominantly water quality more specifically eutrophication and TBT related.	Annual reporting of progress with initial projects over 3 years - frequency of investigations dependent on project		1108	-	-		Natura 2000 Marine Monitoring Handbook, National Sampling Procedures and Marine Procedures Manuals	The cost of this work is spread over 3 years	The cost of this work is spread over 3 years
Bathing Waters Directive	Bacteriology, aesthetics, algal blooms	20 during bathing season	476	370	350	20	Annually	National Sampling Procedures Manual	Some investigational work is associated with this Directive particularly in North West Region	Figures derived from Head Office MPMG review information with additional 40K added for investigational work derived from NMS budget (not inc. any additional lab analyses).

Biodiversity Action Plans	Assessment of status designated species	No routine monitoring is undertaken associated with BAPs for marine habitats and species	31 marine habitats and 19 marine species	-	-	-	-	-	Each habitat and species action plan has actions placed upon the Agency in relation to its regulatory duties. The Agency is represented on a variety of external groups associated with BAPs relating to marine habitats and species.	No resource allocation as no specific programme of work other than Agency representation at national for a concerning specific BAPs. Consideration also given in LEAPs
Water Framework Directive	Macroinvertebrate community, estuarine fish community, phytoplankton, macroalgae	Determinand specific	All transitional and coastal waters	160	-	-	-	-	Programme in development - R & D funding supporting regional review and testing of data with some new data collection in 2001 /2002 (estuarine fish and benthos)	Programme in development - R & D funding supporting regional review and testing of data with some new data collection in 2001 /2002 (estuarine fish and benthos)
OSPAR Convention	Eutrophication, Hazardous Substances, Biodiversity Strategies		Forth - Portsmouth, South Wales, North West Coastline						No separate work associated with these strategies - UWWTD usually doubles for OSPAR e.g. eutrophication strategy common procedure applies to: potential problem areas; these areas broadly relate to current round of Sensitive Area assessments for UWWTD	
OSPAR Convention - Radioactive Substances	Radionuclides in water, biota and sediments		400-500	200	160	40	Annual			Figures provided by NCAS approximated at 2/3s overall programme targeted at marine waters

Catchment/Abstraction Management Strategy	Site specific	-	-	-	-	-	-	-	R & D project assessing fresh water flows to estuaries	R & D project assessing fresh water flows to estuaries
Shoreline Management Plans and Flood Defence	According to guidance issued by DEFRA (Shoreline Management Plans: A Guide for Coastal Defence Authorities 2001) - bathymetry, beach profiles, aerial survey, wind/wave and water level data, biological assessment. Also includes Sea defence inspections.	Varies according to survey type	Varies according to survey type - predominantly Anglian and Southern Region	495	415	80	Varies - data used for a variety of purposes		Shoreline Mnmt plans produced for all Region e.g. 6 in Anglian Region. Other Regions also have similar but smaller programmes. Methods vary. Thames Region also has a considerable investment in Tidal Defence	Costs only identified for Anglian Region plus estimate for Tidal Defence inspections (2FTE at £25k each plus estimate of £20k for vessel maintenance and operation)
Coastal Habitat Management Plans	Site specific according to EU designated features / habitats	Monitoring associated with these sites associated with SMPs and Flood Defence funding. Predominantly	9 pilot sites	-	-	-	Varies according to biological assessment required	JNCC Natura 2000 Marine Monitoring Handbook	Linked to Shoreline Management Plans - 9 pilot projects with 50% LIFE funding from EU	Linked to Shoreline Management Plans - 9 pilot projects with 50% LIFE funding from EU
Local Environment Action Plans	Specific to local issues	-	-	-	-	-	Dependent upon issue raised	Dependent upon issue raised	LEAPs often link into operational monitoring where issues raised locally require operational investigations	LEAPs often link into operational monitoring where issues raised locally require operational investigations
Eutrophication Control Action Plans	Nutrients, biological "endpoints" (e.g. macroalgal mats), modelling	-	Currently 1 pilot site in the Tees estuary	-	-	-	-	-	-	-
Marine Environment High Risk Areas (MEHRA)	None	None	Sensitive areas identified	-	-	-	-	-	Environment Agency Wales lead for Agency	Environment Agency Wales lead for Agency
Non-native species review	All routine biological assessment - incidental occurrence of alien species	N/A	N/A	-	-	-	-	-	Review to be completed in 2002	Review to be completed in 2002

Fisheries Monitoring and Enforcement	Fisheries enforcement activities for migratory salmonids (licenced commercial fisheries and anti-poaching activities) and restricted fisheries (bass)			194					Figures based on number of vessels and operating hours assuming two staff involved on mid point Gr3 plus SA and NI. Vessel maintenance estimated from SW figures at £2.4k per vessel plus £50 per day operating cost. Capital and indirect costs not
--------------------------------------	---	--	--	-----	--	--	--	--	--

Support to Navigation and Harbour Operations

Restricted to Southern Region (Rye Harbour) and EA Wales (Dee

Operational - Discharge Impact Assessment?	Region/Area defined	Region/Area defined	Region/Area defined	307	Operational Monitoring is usually defined by EA Regions and Areas in response to site specific issues relating to Agency regulatory duties. The types of monitoring have been defined in the Agency's Environmental Monitoring Programme Manual for Water Quality. In addition guidance has been issued for Agency staff and external organisations in relation to specific marine related activities for environmental impact assessment: Barrages, Coastal defence (including beach nourishment), Ports, shipyards, harbours, piers and jetty developments (including navigation works), Sea outfalls, Dredging of riverine, estuarine and marine sediments (including commercial dredging and dredging for navigation) and reclamation, Petro-chemical industry - offshore developments, including exploration, Pipelines (Oil and gas), Marinas, Tidal power developments, Windfarms, both on-shore and off-shore. N.B. the costs associated with this type of monitoring are only those noted in the NMS programme and arising from marine biology activity this does not account for the full operational programme - it is not possible to quantify fully this aspect of the Agency'	
Operational - Pre-contention studies and post-scheme appraisal?	Region/Area defined	Region/Area defined	Region/Area defined			
Operational - Detection of trends and WQ Characterisation?	Region/Area defined	Region/Area defined	Region/Area defined			
Operational - R&D and Regional Operational Investigation?	Region/Area defined	Region/Area defined	Region/Area defined			
Operational - Defensive Studies?	Region/Area defined	Region/Area defined	Region/Area defined			
Operational - Post Pollution Incidents?	Region/Area defined	Region/Area defined	Region/Area defined			
TOTAL ANNUAL COST				4321	2273.5	278.5

Key:

NLS National Laboratory Service
NMS National Marine Service
NCEHS National Centre for Environmentally hazardous Substances
NCEDS National Centre for Environmental Data and Surveillance
NCAS National Compliance and Assessment Service

* The costings for these drivers should be viewed with caution as they are only approximations based on best available information
** Nuisance Marine Algal Monitoring is undertaken in association with Bathing Waters Directive
Re Costed at 25k p.a. to derive costings (as per biology priority planning)

Appendix 5 - Summaries of Regional Tidal Water Work Produced by NMS Customer Group.

Summary of Tidal Waters Activities in Anglian Region

Should be read in conjunction with **SRF tables**, **Humber routine survey tables** and **Central Area Marine tender specification tables**, Spot sample details from **SIMS tables** and **Dave Jowett table**.

Activities involving NMS

Biology:

- NMMP OEB (1 site) sediments (7 sites), macro-benthos (7 sites), trawling (3 sites)
- Humber Benthic Programme sub tidal sampling (30-40 site)
- EDMAR trawling as appropriate
- Eastern area quinquennial surveys (approx 10 sites)

Chemistry:

- DSD Water / sediment sampling (sub tidal sites)
- TiO₂ Directive (Humber)
- UWWTD Candidate SA(E) – continuous survey of whole coast

Activities not involving NMS

Biology:

Routine Surveys

- NMMP mussel collection
- Great Ouse Programme
- Intertidal programmes for Humber, Wash, and selective east coast estuaries
- GQA work

Chemistry/Microbiology:

- DSD sediment / Water samples (sites)
- Bathing waters (37 sites throughout Anglian Region- essentially coastal)
- SFWD (Circa 25 sites sampled monthly – various estuaries- some boat based- some land based.)
- GQA work

Other

- Macroalgal mat surveys (UWWTD).
- Reactive and ad-hoc investigations eg directive sample failures, pollution incidents (eg related to Shellfish Hygiene class deterioration, Bathing Waters exceedences, industrial spillages)
- Wash Forum R&D / Special investigations
- Habitats Directive mSACs / SPA investigation, data provision etc (includes intertidal coring for macroinvertebrates etc in relation to key 'bird sites'. This is integral to 'Site Characterisation' of European Sites.(FER)
- Water Resource issues (eg flow needs etc.)(WR)
- Hydrometry- tide guage maintenance, (WR/FER)

- Emergency response provision for coastal oil spills including regular estuarine validation exercises. (Cross functional activity- FER, EP, Emergency Workforce. Also linked with signed off Memoranda of Understandings with Ports/ Coastal councils)
- Foreshore Recharge : Intertidal biological monitoring for flood defense schemes. Agreed 'must do' with English Nature prior to scheme approval. (FER/Flood Defense)
- Responding to external consultations (eg Planning applications, Land Drainage consents, discharge consents, abstraction licences), includes agreeing mitigation/compensation schemes and biological surveys by developers.
- Consultation on Flood Defence schemes, agree mitigation/compensation & biological surveys(FER/Flood Defense).
- Education/PR activities (eg Managed retreat sites in Essex Estuaries- Flood Defense)
- Input to national/technical groups eg. MBTG, Estuary Classification Scheme etc.
- Input to Humber/Wash/Essex Estuary etc. Partnership/Action groups (also see below)
- Monitoring reviews
- Flood Defense work.: This is a major work area in All of Anglian Region. Suggest you contact Flood Defence direct for overview of capital schemes, major partnership managed retreat etc.)
- Regulation of nuclear power stations/Gas power stations etc (PIR)

Fisheries

Not aware that any fisheries work is done (MJ)

Conservation /Archaeology

Anything not covered above eg BAPs & HAPs

Partnership Work

Partnership research with Anglian Water and Essex University looking into use of Sterols as differential indicators of animal/human pollution. (Management time only-FER)

Many estuaries have multi agency Management Groups of which EA are integral to (eg Thames Estuary Partnership, Essex Estuaries Initiative, Stour/Orwell Management Group)

SUMMARY OF TIDAL WATERS ACTIVITIES IN NORTH WEST REGION

Activities involving NMS

Biology: *Contact Karen Williams*

- NMMP sediments, macro-benthos, trawling (3 sites)
- Algae: collection of samples – analyses by consultants (MBCC, Bangor – also see Chemistry)

Chemistry:

- DSD sediment sampling (12 sub tidal site)
- Nutrient / plankton dynamics (MBCC)
- DSD water sampling
- Weston Canal DSD (water / sediments)

Microbiology: *Contact Mike Weston, Jon Greaves*

- Bathing Waters

Activities not involving NMS

EP: Water Quality: *Contact Andrew Wither, Peter Jones*

We cover the coastal waters from the Dee to the Solway Firth including Liverpool and Morecambe Bays and the estuaries of the Mersey, Ribble, Wyre, Lune, Kent, Leven, Duddon, Ravenglass harbour (Esk, Irt, Mite), Waver, Esk and Eden.

- Routine estuary surveys (Statutory and permissive sites)
- Regional Operational surveys (outfall performance, nutrients/plankton)
- Manchester Ship Canal (statutory and permissive monitoring of tidal and non-tidal reaches)
- Chloralkali Directive (Hg stand-still – annual survey dating back to 1974 in collaboration with Zeneca -sediment sampling using our hovercraft)
- Assistance to other regions with sediment collection by Hovercraft (Anglian, North East, EA Wales, Southern etc)
- Special investigations in relation to Bathing Waters eg. one or two complete tidal-cycle monitoring, tracer tracking, data collection for numerical models etc,

Biology: *Contact Karen Williams*

Routine Surveys

- NMMP mussel collection
- Chemistry: collection of intertidal DSD sediment samples (13 sites)

Other

- Algae: Bathing Beach monitoring (33 sites) **only** reactive algal monitoring (ie not “best endeavours” or “minimum effort” – all microbiological work undertaken by Marine & Special Projects Group/temporary or Area staff Information for proposed Sensitive Area designation for Liverpool Bay)
- Responding to external consultations (eg Planning applications, Land Drainage consents, discharge consents, abstraction licences), includes agreeing mitigation/compensation schemes and biological surveys by developers.

- Consultation on Flood Defence schemes, agree mitigation/compensation & biological surveys.
- Reactive and ad-hoc investigations eg pollution incidents.
- Education/PR activities
- Input to national/technical groups eg. MBTG, Estuary Classification Scheme etc.
- Input to Mersey Estuary Partnership/Action groups
- Review of Mersey Estuary data

Fisheries: *Contact Bob Lee*

- Mersey fish population surveys (quarterly 4 sites – this programme on-hold last two years – whole Mersey monitoring programme under active review by ad hoc working group)
- Reactive monitoring eg pollution incidents
- Education/PR
- Enforcement/Sea Fisheries Powers
- External consultations (eg Planning apps etc)
- Consultation re Flood Defence schemes
- Estuary Partnership/Action Groups

Conservation & Archeology: *Contact Mark Diamond, Karen Williams*

- External Consultations (eg planning Apps, LD consents etc)
- Consultation re Flood Defence Schemes (agree mitigation/enhancement opportunities etc. Produce Shoreline Management Plans & report on all losses/gains of UK BAP habitats resulting from EA FD works & those of drainage authorities)
- Habitats Directive (*Sarah Peet*): Review of all current & proposed authorisations/permissions which could impact SPA/SACs
- Biodiversity:BAPS/HAPS, species action plans etc

Other Functions contacts:

- **Flood Defence & Coastal Protection** Contact Paul Stainer
- **Emergency Response** Contact Steve Smith – he is responsible for recently purchasing the Mersey version of OSIS (oil spill information system). M & SP and the south area have copies but as yet no training has taken place. The model covers Liverpool Bay and the Mersey estuary.
- **Contaminated land:** Contact Helen Moorehouse
- **Waste:** Bill Darbyshire (Region)
- **PIR:** Ian Haskell (Region)
- **Landscape:** Dermot
- **Recreation:** Mark Diamond
- **Air Quality:** Ian Haskell (Region)
- **LEAPS:** ? (Area based)
- **PR/Education:** General: Fiona Williams, Mersey: Peter Jones (Chair of Education and Interpretation Working Group)
- **Planning Liaison:** David Lee (Region)
- **Land Drainage Consent:** Paul Stainer
- **Water Resources/CAMS/Abstraction Licensing:** Mike Eggborough

- **Discharge Consents:** Sheila Sowerby

Other Groups with Tidal Interest:

Internal:

- Mersey Estuary Monitoring Group – newly convened group to consider all aspects of monitoring both internal and external.

External:

- Mersey Estuary Strategy Contact Caroline Salthouse
- Mersey Basin Campaign Contact Andrew Wither
- Mersey Management Plan – Mersey Strategy Contacts Policy – Andrew Wither, Education /PR Peter Jones
- Irish Sea Forum Contact Peter Jones
- PISCES (Partnership of Irish Sea Coastal and Estuary Strategies) Contact Andrew Wither
- Morecambe Bay Forum Contact Andrew Wither
- Estuarine and Coastal Science Association – Agency nominated Council Member Peter Jones
- Universities (Liverpool – Oceanography & PEMPL, UCNW- Menai Bridge, SOC, Cardiff, Plymouth)
- Proudman Oceanographic Laboratory (Birkenhead)
- Plymouth Marine Laboratory
- Hydraulics Research (geomorphological & water quality models)
- BMT (Marine Information Systems Ltd) (Oil spill and Water Quality modelling)
- Westlakes Scientific (numerical models)
- CEFAS (Burnham & Lowestoft Labs)
- SEPA
- Fisheries Research Centre Dublin (Irish Dept of the Marine)
- Local Authorities
- Mersey Dock and Harbour Company
- Associated British Ports (Garston)
- Manchester Ship Canal Company
- North West & North Wales Sea Fisheries Committee
- United Utilities (formerly North West Water)
- Wildlife Trusts
- Local Interest/Action Groups
- English Nature
- English Heritage

Peter Jones July 2001

TIDAL WATERS ACTIVITIES – SOUTHERN REGION

Flood Defence

Section 105 mapping in tidal waters. Project to be completed this year; work mainly delivered under a national framework consultancy agreement. Next year activity to be limited to map updates.

Annual beach profiles carried out by aerial survey, some manual surveys using GPS.

Offshore bathymetry data surveys.

Bathymetry surveys of a few locations for specific local needs.

Contacts Dave Murphy FD Strategic Planning
 Andrew Davies FD Improvements/ National Capital Projects
 Area Flood Defence Managers may also have info.

Water Resources

Catchment Action Management Strategy – various CAMS projects now being implemented across Region.

Contacts ~~Phil Smith~~ Regional Biology Co-ordinator
 George
 Merrill

FRCN

Fisheries enforcement surveys – Salmon and eels

Tidal Waters Fishery Surveys – Medway only (John Cave)

Conservation not actively commissioning work *, tend to audit EIA's from others.

Rye Harbour – Agency the harbour Authority and operates vessels to meet harbours statutory duties. (Carl Bagwell)

Contacts Ian Johnson Regional FRCN Manager
 John Cave on fishery survey only
 Carl Bagwell on Rye only

ENVIRONMENTAL PROTECTION

Routine water quality monitoring in Medway and Swale (using Cerberus).

Routine UWWT Directive water quality monitoring in Portsmouth and Langstone Harbours (contract vessels).

Oil Spill responses, booming operations (Sue Fewings, Hampshire)

Habitats Directive Investigations for Review of Permissions (Dave Lowthion/ Steve Cook)

Bathing Water Investigations

Contacts Dave Lowthion
 Sue Fewings on oil spill requirements
 Steve Cook on regional Habitats Project

INTERNAL/EXTERNAL GROUPS

National Review of small boats

Solent Forum/ SF Research Group

Thames Estuary Partnership

SCOPAC

Various Flood Defence Strategy Groups

190601c

SUMMARY OF TIDAL WATERS ACTIVITIES IN SOUTH WEST REGION

Activities involving NMS

Biology:

NMMP sediments, macro-benthos, trawling (3 sites Tamar Estuary)

Chemistry:

DSD sediment sampling (1 site in Severn Estuary)

Activities not involving NMS

Biology:

Routine Surveys

NMMP sediments, macro-benthos and trawling in Poole Harbour

Other

Algae: Bathing Beach reactive algal monitoring. Information for proposed Sensitive Area designation for the tidal water candidate waters..

Reactive and ad-hoc investigations eg pollution incidents.

Input to national/technical groups eg. MBTG, Estuary Classification Scheme etc.

Fisheries: *Contact Stuart Bray (7-24-2061) or Mark Pilcher (7-24-5041)*

Sea Fisheries Authority in Cornish Estuaries Taw /Torridge, and small portion estuaries in South Wessex.

Boat patrols to enforce sea fisheries byelaws for shellfish and sea fish

Bass protection patrols in Nursery Areas. Staff British Sea Fisheries Officers for bass.

Boat patrols to protect salmon and sea trout. Enforcing SFFA.

Some work assisting others on monitoring bass populations.

External consultations (planning apps etc)

Multi Agency enforcement

FD Consultations

Education/PR

Responding to pollution incidents

Conservation: *Contact Lyn Jenkins (7-24-2357) or Sonia Thurley (7-24-5054)*

External Consultations (eg planning Apps, LD consents etc)

Consultation re Flood Defence Schemes (agree mitigation/enhancement opportunities)

Habitats Directive - Review of all current & proposed authorisations/permissions which could impact SPA/SACs

Biodiversity – Giant Hogweed and Triangular Club Rush in Tamar Estuary.

Flood Defence: *Keith Nursey (7-24-2386)*

Sea Defence Surveys – i.e. recording details of Coastal Defence Assets

Maintenance of Assets

Capital Works

Shoreline Management Plans

Data Collection – Bathymetric Surveys. LIDAR coverage of South Coast (Lands End to Christchurch), beach monitoring

Section 105 flood risk mapping of tidal areas

Flood Warning Service

On site tide level monitoring

Use of Tide Gauges

Other Functions:

For details of other Water Quality routine and Investigations work – Rich Walmsley (7-24-2145)

For details of work undertaken by the Regional Tidal Waters Section – Catherine Wright (7-24-2404)

SUMMARY OF TIDAL WATERS ACTIVITIES IN THAMES REGION

Activities involving NMS

Biology:

- NMMP sediments, macro-benthos, trawling (2 sites)
- Thames Benthic Programme sub tidal sampling (6 site)

Chemistry:

- DSD sediment sampling (12 sub tidal site)

Activities not involving NMS

Biology:

Routine Surveys

- NMMP mussel collection
- Thames Benthic Programme inter-tidal monitoring (5 sites), (surveillance programme).
- Teddington Low Flow monitoring: 5 invertebrate sites, sampled quarterly as part of Operating Agreement with Thames Water.
- Chemistry: collection of intertidal DSD sediment samples (13 sites)

Other

- Algae: Bathing Beach 'Best Endeavours' monitoring (8 sites), plus reactive algal monitoring. Information for proposed Sensitive Area designation for the tidal Thames.
- Responding to external consultations (eg Planning applications, Land Drainage consents, discharge consents, abstraction licences), includes agreeing mitigation/compensation schemes and biological surveys by developers.
- Consultation on Flood Defence schemes, agree mitigation/compensation & biological surveys.
- Reactive and ad-hoc investigations eg pollution incidents.
- Education/PR activities
- Input to national/technical groups eg. MBTG, Estuary Classification Scheme etc.
- Input to Thames Estuary Partnership/Action groups
- Review of Thames Estuary data

Fisheries: *Contact Steve Colclough (7 25 4817)*

- Thames fish population surveys (spring/autumn, 6 sites)
- Reactive monitoring eg pollution incidents
- Education/PR
- Enforcement/Sea fisheries Powers
- External consultations (eg Planning apps etc)
- Consultation re Flood Defence schemes
- Thames estuary Partnership/Action Groups

Conservation & Archeology: *Contact Dave Webb/Rachael Hill*

- External Consultations (eg planning Apps, LD consents etc)

- Consultation re Flood Defence Schemes (agree mitigation/enhancement opportunities etc. Produce Shoreline Management Plans & report on all losses/gains of UK BAP habitats resulting from EA FD works & those of drainage authorities)
- Habitats Directive (*Caroline Bidston*): Review of all current & proposed authorisations/permissions which could impact SPA/SACs
- Biodiversity: BAPS/HAPS, species action plans etc

Other Functions contacts:

- **Flood Defence & Thames Barrier Operations (incl Sea Level Rise project):** Sarah Lavery (Tidal Operations TL)
- **EP: Water Quality:** contact Richard Oatley, Chris Hazleton, Jon Brock
- **Thames CSO project:** Agency & Thames water joint project, contact Jon Goddard (CSO project manager)
- **Contaminated land:** Contact Sheena Engineer
- **Waste:** Mike Fletcher (Region), Mike Newman (area)
- **PIR:** Dave Frith (Region), Paul Hudson (Area)
- **Landscape:** Richard Copas
- **Recreation:** Colin Woodward
- **Air Quality:** Phil Heaton (area)
- **LEAPS:** Kristina Richards
- **Thames 21:** Joint initiative between Agency, Thames Water, PLA, Tidy Britain etc. Contact Ian Larkins
- **PR/Education:** Tony Proud
- **GLA Liaison:** Anna Burns
- **Planning Liaison:** N Bank = NE Area, South bank = SE Area James Burstow (NE Area), Ben King (SE Area)
- **Land Drainage Consent:** Ian Blackburn, Lucky Wehalla (both SE Area)
- **Water Resources/CAMS/Abstraction Licensing:** Julie Lee Stewart/Steve Barrow
- **Discharge Consents:** Claire Murphy
- **Thames estuary Partnership & Thames estuary projects:** Helen Hancock
Project manager/coordinator for various projects including (reports to Thames SE, NE, Anglian & Southern Area managers).
- **Thames estuary Strategy development:** Project due to be completed by end 2001. Andy Stewart is PM, reports to NE Area manager (don't ask me why!)
- **Shellhaven (London Gateway) development proposal:** Massive proposal will require significant input from Thames/Anglian staff. Contact Helen Hancock

Other Groups with Tidal Interest:

Internal:

- Tidal Thames Function Group

External:

- Thames Estuary Partnership & associated Action Groups
- Universities
- Local Authorities

- County Councils
- London Port Health Authority
- Port of London Authority
- Kent & Essex Sea Fisheries Committee
- Thames Water Utilities Limited
- Anglian water
- Wildlife Trusts
- GLA
- Local Interest/Action Groups
- English Nature
- English Heritage
- Thames 21

Lindsey Richardson June 2001

Appendix 6 - Classification of Monitoring

**CLASSIFICATION OF MONITORING ACTIVITIES IN THE AQUATIC
ENVIRONMENT (Version 5 (11/10/00))**

	MONITORING ACTIVITY (Chemical, Biological & Microbiological in all media e.g. water, sediments & biota)	FINAL CLASSIFICATION (see Key below)
1	Environmental Monitoring to satisfy EC Directives <ul style="list-style-type: none"> - Surface Water Abstraction - Freshwater Fisheries - Bathing Waters - Shellfish Waters - Dangerous Substances - Exchange of Information - Titanium Dioxide - IPPC - Habitats Directive (no specific monitoring requirements at present) 	
	Routine Monitoring at Designated Points	
1000	Compliance with Standards	I
1010	Setting of Operational Standards	I
	Follow up samples relating to failures at Designated Points	
1020	At Designated Points	I
1030	At Other Points	U
	Routine Monitoring at Proposed Designated Points	
1040	Compliance with Standards	N
1050	Setting of Operational Standards	N
	Follow up samples relating to failures at Proposed Designated Points	
1060	At Proposed Designated Points	O
1070	At Other Points	O
	Routine Monitoring at other than Designated Points	
1080	Compliance with Standards	O
1090	Setting of Operational Standards	O
1100	Follow up sampling relating to failures at other than Designated Points	O
1110	Monitoring associated with Improvement Programmes	I
1120	Monitoring for the purpose of authorising a discharge (related to a Directive)	I
2	Environmental Monitoring to satisfy requirements of UWWT and Nitrates Directive	
2000	Routine Monitoring of Designated Sensitive Areas, Polluted Waters or Vulnerable Zones	I
2010	Monitoring of Candidate Sensitive Areas, Polluted Waters or Vulnerable Zones	U
2020	Monitoring at any other location (related to these Directives)	O
3	UK and International Commitments <ul style="list-style-type: none"> - Oslo Paris Commission - North Sea Conference (Annex 1A) - National Marine Monitoring Programme (NMMP) - Harmonised Monitoring Scheme - Environmental Change Network - GEMS 	
3000	Monitoring at Designated Sites	U
3010	Monitoring at Other Sites	O
4	Other Environmental monitoring	
4000	Monitoring to assess compliance with Rivers Ecosystem classification (RE) Objectives	U
4010	Sampling in response to RE failures	N
4020	Monitoring of proposed new designations of RE Classified stretches	O
4030	General Quality Assessment (GQA) – Chemistry	U
4040	GQA - Biology (Annual)	O
4050	GQA - Biology (5 yearly survey)	U
4060	Sampling in response to GQA Class changes	O
4070	Aesthetics Surveys (GQA) – Rivers and Bathing Beaches	N

**CLASSIFICATION OF MONITORING ACTIVITIES IN THE AQUATIC
ENVIRONMENT (Version 5 (11/10/00))**

	MONITORING ACTIVITY (Chemical, Biological & Microbiological in all media e.g. water, sediments & biota)	FINAL CLASSIFICATION (see Key below)
4080	Estuaries Classification (CEWP) Monitoring (5 yearly survey)	U
4090	Estuaries Classification Monitoring (Annual)	O
4100	Protection of Public Water Supply Abstractions	O
4110	Protection of Non Public Water Supply Abstractions	O
4120	Monitoring in accordance with other Agency Strategies that include specific monitoring requirements (e.g. Long Term Blue Green Algae Sites, National Pilot ECAPS)	N
4130	Monitoring in accordance with other Agency Strategies that do not include specific monitoring requirements (e.g. Pesticides, Eutrophication, Endocrine Disrupting Substances, Blue Green Algae Action Plans, SSSI Monitoring)	O
4140	Monitoring in response to Public Health Enquiries	O
4150	Discharge Impact Assessments, Pre-consenting Studies and Post Scheme Appraisal	O
4160	Development Impact Assessment Monitoring	O
4170	Diffuse Source Impact Assessment Monitoring	O
4180	Detection of Trends, Bioaccumulation and General Water Quality Characterisation	O
4190	Defensive Studies	O
4200	Model development and Validation	O
4210	Samples taken for Instrument Calibration	I/U/N/O
5	Groundwater Monitoring	
5000	EC Groundwater Directive Monitoring	I
5010	Groundwater National Network Monitoring	N
5020	Other Groundwater Monitoring	O
5030	Groundwater Nitrate monitoring for NVZ Designations	U
5040	Discharge Impact Assessments, Pre-consenting Studies and Post Scheme Appraisal	O
5050	Development Impact Assessment Monitoring	O
5060	Diffuse Source Impact Assessment Monitoring	O
5070	Detection of Trends and General Water Quality Characterisation	O
5080	Defensive Studies	O
5090	Model development and Validation	O
5100	Samples taken for Instrument Calibration	I/U/N/O
6	Effluent Monitoring	
6000	Regulatory Monitoring – Routine Audit in accordance with the Agency's declared National Policies (e.g. Consents Manual)	N
6010	Regulatory Monitoring – Formal Enforcement	N
6020	Regulatory Monitoring – Additional samples above requirements specified in the Agency's declared National Policies (e.g. Consents Manual)	O
6030	Investigations Monitoring	O
6040	Discharge Impact Assessments, Pre-consenting Studies and Post Scheme Appraisal	O
6050	In connection with Development Impact Assessment	O
6060	In connection with Diffuse Source Impact Assessment	O
6070	Detection of Trends, Bioaccumulation and General Water Quality Characterisation	O
6080	Defensive Studies	O
6090	Model development and Validation	O
6100	Effluent monitoring to audit compliance with EC Directives	I
6110	Effluent monitoring relating to failures at EC Designated Points	I
6120	Effluent monitoring associated with UK and International Commitments (e.g. OPARCOM)	U
6130	Samples taken for Instrument Calibration	I/U/N/O
6140	Leachate monitoring	O
6150	Monitoring of Mine Wastewaters as part of the DETR direction for pre- consenting and EC Dangerous Substances designation studies	U
7	Pollution Incidents (all controlled waters)	
7000	Monitoring to identify the cause of pollution	U

**CLASSIFICATION OF MONITORING ACTIVITIES IN THE AQUATIC
ENVIRONMENT (Version 5 (11/10/00))**

	MONITORING ACTIVITY (Chemical, Biological & Microbiological in all media e.g. water, sediments & biota)	FINAL CLASSIFICATION (see Key below)
7010	Formal evidence monitoring	U
7020	Incident impact monitoring	O
7030	Post incident remediation monitoring	O
8	Research and Development (R&D)	
8000	National R&D Project Monitoring	N
8010	Regional R&D Project Monitoring	O
9000	Any monitoring to satisfy a legal obligation not specifically identified above (see note below)	U

KEY

- I** Monitoring associated with National and International commitments e.g. European Directives.
- U** Monitoring associated with programmes agreed by the Agency solely with the United Kingdom Government e.g. DETR and NAW.
- N** Monitoring associated with programmes agreed at a National level by the Agency and implemented in all Regions.
- O** Monitoring associated with Operational programmes agreed at a Regional and Area level and implemented locally.

Note – Category 9000

Regions must be able to justify any activity under this category in relation to an act of parliament, legal undertaking or obligation. Examples of this category would include:

The determination of the inquiry into the Agency's Maidenhead (Thames Region) Flood Relief Scheme includes a requirement to monitor water quality.

The outcome of the public enquiry into Minimum Residual Flows at Denver (Anglian Region) resulted in water quality monitoring obligations.

This category does not include monitoring commitments made at public meetings that do not have any legally binding status.

CLASSIFICATION OF MONITORING ACTIVITIES IN THE AQUATIC ENVIRONMENT (Version 5 (11/10/00))

GUIDELINES FOR THE IMPLEMENTATION OF THE CLASSIFICATION OF MONITORING ACTIVITIES WITHIN REGIONAL YEAR 2000 PRE-PLANNED SAMPLING PROGRAMMES (Version 2, 7/1/00)

Background

Following the review of pre-planned Regional Operational Monitoring Programmes in March 1999 it was agreed by OMT that a consistent approach to the classification of monitoring activities within the aquatic environment was needed. As a consequence the Water Quality Monitoring Quality Assurance Group (QA Group) was tasked with deriving a common classification system. In collaboration with Regions the QA Group finalised a list of monitoring activities and a hierarchical method of prioritising them. This hierarchy is based on the level at which a decision is needed in order to change a programme. This is based on four categories defined as:

- I Monitoring associated with National and International commitments e.g. European Directives.
- U Monitoring associated with programmes agreed by the Agency solely with the United Kingdom Government e.g. DETR and NAW.
- N Monitoring associated with programmes agreed at a National level by the Agency and implemented in all Regions.
- O Monitoring associated with Operational programmes agreed at a Regional and Area level and implemented locally.

The final classification was released to Regions on 5th November 1999 as Version 3. In addition it was also sent to RGMs and the Director of Operations on the 25th November with a recommendation that it should be implemented within Regional sampling programmes. These guidelines are intended to assist Regions in this process. A re-coded Version 4 has since been produced and released to Regions on 7/1/00.

Sampling Programmes

The initial task is to classify monitoring activities at all sampling points at the sample level. This of course only applies to the pre-planned sampling programme. Reactive sampling cannot be classified in advance. These samples can only be classified at the time of sampling. It is self evident that a sample taken at any given point can have a multitude of purposes attached to it. For example a river sample could be taken for EC Fisheries Directive, EC Dangerous Substances Directive, General Quality Assessment etc. The number of visits to that site will be determined by the maximum sampling frequency as dictated by one of the individual purposes. Examples of "typical" regimes at sampling points would be:

Example 1

In this example the *primary (p)* purpose for taking a sample at the site is an EC Directive, classified "I" by the system described above. As this is to monitor compliance with a standard the activity code is "1000" (as in Version 4 of the Classification of Monitoring Activities list). In addition sampling for two other Directives are *embedded (e)* within the sampling programme for that site. GQA monitoring, classified as "U", is also embedded along with an Operational Investigation, (in this example a Diffuse Source Impact Assessment, 4170 in Version 4) classified as "O". In this example the Investigation requires the addition of extra determinands

CLASSIFICATION OF MONITORING ACTIVITIES IN THE AQUATIC ENVIRONMENT (Version 5 (11/10/00))

onto the existing analytical suite generated by the other programmes. This example is shown in the table below.

SITE NAME	MONITORING ACTIVITY TYPE	MONITORING CLASSIFICATION	MONITORING ACTIVITY CODE	NUMBER OF SAMPLES	PRIMARY(P) or EMBEDDED(E)
RIVER X AT BLOGGS BR	FWFD	I	1000	12	P
RIVER X AT BLOGGS BR	SWAD2	I	1000	8	E
RIVER X AT BLOGGS BR	DSD2	I	1000	12	E
RIVER X AT BLOGGS BR	GQA	U	4030	12	E
RIVER X AT BLOGGS BR	ROM	O	4170	6	E

Example 2

In this case the primary purpose for sampling the site 12 times a year is Harmonised Monitoring, classified as "U", with embedded GQA samples. There are also 12 embedded Operational samples, again indicating that this is the addition of extra determinands to the analytical suite generated by the primary programme. However in this case 12 *primary* Operational samples have been added to the site's sampling programme, therefore generating 24 sampling visits in total. This example is shown in the table below.

SITE NAME	MONITORING ACTIVITY TYPE	MONITORING CLASSIFICATION	MONITORING ACTIVITY CODE	NUMBER OF SAMPLES	PRIMARY(P) or EMBEDDED(E)
RIVER Y AT TOWN	HARM	U	3000	12	P
RIVER Y AT TOWN	GQA	U	4030	12	E
RIVER Y AT TOWN	ROM	O	4150	12	E
RIVER Y AT TOWN	ROM	O	4150	12	P

A general point to note is that the total number of sampling occasions generated by a programme at a site is always the sum of the individual number of *primary* purpose samples. Example 2 illustrates this principle.

In this way every sampling point within the total sampling programme will generate a number of *primary* and *embedded* samples in each monitoring class.

The entire sampling programme can be defined in a way which will give the total number of samples taken within each tier of the classification, i.e. the numbers of *primary* samples taken, plus the number of *embedded* samples in each category, which by definition only generate extra determinations over and above those required by the primary purposes.

Of course the hierarchy of the monitoring classifications must be adhered to. Thus a sample with a purpose "I" can never be embedded within a primary purpose "O".

The above system of hierarchical classification is applicable to all types of sampling points in the aquatic environment, freshwaters, marine waters, effluents and groundwaters.

Appendix 7 - Dangerous Substance Directive Monitoring Sites in Tidal Waters

EC Dangerous Substance Directive - List 1
Coastal and Estuarial Downstream, Sed/Blots & National Network Sites (2000)

Region	URN	Sampling Point Name	NOR	Est/Coa
Anglian	82M01H	RIVER OUSE THE POINT KINGS LYNN HIGH WATER	TF6010023400	E
Anglian	82M01L	RIVER OUSE THE POINT KINGS LYNN LOW WATER	TF6010023400	E
Anglian	82M09H	THE WASH CORK HOLE TIDE GAUGE HIGH WATER	TF6050001800	E
Anglian	82M09L	THE WASH CORK HOLE TIDE GAUGE LOW WATER	TF6050001800	E
Anglian	SE28	R BLACKWATER HERONS POINT	TF6050001800	E
Anglian	SE37	R BLACKWATER FULL BRIDGE	TF6050001800	E
Anglian	SE37	R CROUCH BATTLE BRIDGE	TF6050001800	E
Anglian	CHV480	COAST OFF VISTA ROAD CLACTON	TM1820014600	C
Anglian	CHV220	WALTON BEACH OFF NEWGATE STREET	TM2550021500	C
Anglian	HCE11	WATHAM HAVEN CUT END LOW SLACK	TF3804013000	E
Anglian	HW3202	BRAMBLE CREEK BRAMBLE ISLAND STAGE	TM2211026120	E
Anglian	LO553500	LOWESTOFT NORTH BEACH OFF THE RAVINE	TM6540004700	E
Anglian	NE13	R COLNE RIVER FERRY	TM0323021730	E
Anglian	ORW100	R ORWELL WOOLVERSTONE MARINA	TM1940031900	E
Anglian	ORW135	R ORWELL LANDGUARD POINT FELIXSTOWE	TM2825031250	E
Anglian	RE08	R ROACH EAST END PAGLESHAM	TM0480020700	E
Anglian	RHNL1	R HUNTER NEW HOLLAND LOW SLACK	TM0795024820	E
Anglian	RHS011	R HUNTER & KILLINGHOLME HIGH SLACK	TM1015017430	E
Anglian	SE05	R STOUR OF PARKESTON QUAY	TM2358033000	E
Anglian	SE12	R STOUR OF PARKESTON QUAY	TM2358033000	E
Anglian	WAV187	R WAVERNEY HADDISCOE NRA OFFICE	TM4580088500	E
Midlands	00004505	1st Pylon D/S Lydney WTW	SO63150035	E
Midlands	00006780	Purton (West)	SO67300450	E
Midlands	00007010	d/s Purton WTW	SO68800442	E
Midlands	00015203	Lower Rias	SO68151825	E
Midlands	00015780	Upper Rias	SO68751845	E
North East	41000015	RIVER TWEEDE AT ROYAL BORDER BRIDGE	NT962005320	E
North East	42500112	NORTH SEA OFF NEWBIGGIN SUMMERHOUSE LANE	N231304880	C
North East	42500121	NORTH SEA AT CAMBOIS	N230808434	C
North East	42600057	SEA OFF CAMBOIS OUTFALL	N230808434	C
North East	43500413	QUEEN'S RAILING STATION	N234408330	E
North East	43500451	RIVER TYNE AT HEBBURN	N234408330	E
North East	43500383	RIVER TYNE AT SOUTH RYTON	N234408330	E
North East	43500326	RED CAR JETTY	N234408330	E
North East	43500334	RIVER TYNE AT SMITHS DOCK	N234408330	E
North East	43500345	RIVER TYNE AT HAVERTON HILL	N234408330	E
North East	43500328	GREATHEAM CREEK LAUNGS BASIN	N234408330	E
North East	43500327	HENDON SEA OUTFALL SURVEY	N234408330	E
North East	43500321	BOULBY - BOIL AT LOW WATER	N234408330	E
North East	43500320	BRIGHTON LSO - 250M INTO PLUME AT LOW WATER	N234408330	E
North East	43500319	BP PROCESS - 250M INTO PLUME AT LOW WATER	N234408330	E
North East	43500318	BRITISH AEROSPACE - 250M INTO PLUME AT LOW WATER	N234408330	E
North East	43500317	HUMBER AT ALBERT DOCK	TA18002730	E
North East	43500316	SCOTBY AT B&L END JETTY	TA18002730	E
North East	43500315	SCOTBY COMPANY 250M INTO PLUME AT LOW WATER	TA18002730	E
North East	43500314	HULL EAST 250M INTO PLUME AT LOW WATER	TA18002730	E
North East	43500313	HULL WEST 250M INTO PLUME AT LOW WATER	TA18002730	E
North East	43500312	HULL AT DRYDOCK BRIDGE	TA18002730	E
North West	86000821	MISC - RIVER GOWY ABOVE BYPHON UNDER M.S.C.	SJ4294774484	E
North West	86000840	MERSEY ESTUARY AT MONKS HALL	SJ5595001820	E
North West	86000710	MERSEY ESTUARY AT FIDDLERS FERRY	SJ5595001820	E
North West	86000722	MERSEY EST AT RUNCORN OLD LOCK HELI PT16	SJ5595001820	E
North West	86000756	MERSEY EST AT WOODWARD WIDNES HELI PT15	SJ5595001820	E
North West	86000782	MERSEY ESTUARY AT HALE HEAD HELI PT14	SJ5595001820	E
North West	86000794	MISC AT STANLOW WHARF	SJ4180071025	E
North West	86000811	MERSEY ESTUARY AT BOUY ET HELICOPTER PT13	SJ5595001820	E
North West	86000822	MERSEY ESTUARY AT SCARBOROUGH FERRY	SJ5595001820	E
North West	86000823	MERSEY ESTUARY AT EGREMONT	SJ5595001820	E
North West	86000828	RIVER MERSEY NEW BRIGHTON HELICOPTER PT	SJ5595001820	E
North West	86000858	RIBBLE ESTUARY AT 1ST MILE POST	SD4480053860	E
North West	86000857	RIBBLE ESTUARY AT 2ND MILE POST (RUB 10)	SD4480053860	E
North West	86000856	RIBBLE ESTUARY AT 3RD MILE POST	SD4480053860	E
North West	86000855	MISC - RIBBLE ESTUARY AT 4TH MILE POST	SD4480053860	E
North West	86000854	MISC - RIBBLE ESTUARY AT 5TH MILE POST	SD4480053860	E
North West	86000853	MISC - RIBBLE ESTUARY AT 6TH MILE POST	SD4480053860	E
North West	86000852	MISC - RIBBLE ESTUARY AT 7TH MILE POST	SD4480053860	E
North West	86000851	MISC - RIBBLE ESTUARY AT 8TH MILE POST	SD4480053860	E
North West	86000850	MISC - RIBBLE ESTUARY AT 9TH MILE POST	SD4480053860	E
North West	86000849	MISC - RIBBLE ESTUARY AT 10TH MILE POST	SD4480053860	E
North West	86000848	MISC - RIBBLE ESTUARY AT 11TH MILE POST	SD4480053860	E
North West	86000847	MISC - RIBBLE ESTUARY AT 12TH MILE POST	SD4480053860	E
North West	86000846	MISC - RIBBLE ESTUARY AT 13TH MILE POST	SD4480053860	E
North West	86000845	MISC - RIBBLE ESTUARY AT 14TH MILE POST	SD4480053860	E
North West	86000844	MISC - RIBBLE ESTUARY AT 15TH MILE POST	SD4480053860	E
North West	86000843	MISC - RIBBLE ESTUARY AT 16TH MILE POST	SD4480053860	E
North West	86000842	MISC - RIBBLE ESTUARY AT 17TH MILE POST	SD4480053860	E
North West	86000841	MISC - RIBBLE ESTUARY AT 18TH MILE POST	SD4480053860	E
North West	86000840	MISC - RIBBLE ESTUARY AT 19TH MILE POST	SD4480053860	E
North West	86000839	MISC - RIBBLE ESTUARY AT 20TH MILE POST	SD4480053860	E
North West	86000838	MISC - RIBBLE ESTUARY AT 21ST MILE POST	SD4480053860	E
North West	86000837	MISC - RIBBLE ESTUARY AT 22ND MILE POST	SD4480053860	E
North West	86000836	MISC - RIBBLE ESTUARY AT 23RD MILE POST	SD4480053860	E
North West	86000835	MISC - RIBBLE ESTUARY AT 24TH MILE POST	SD4480053860	E
North West	86000834	MISC - RIBBLE ESTUARY AT 25TH MILE POST	SD4480053860	E
North West	86000833	MISC - RIBBLE ESTUARY AT 26TH MILE POST	SD4480053860	E
North West	86000832	MISC - RIBBLE ESTUARY AT 27TH MILE POST	SD4480053860	E
North West	86000831	MISC - RIBBLE ESTUARY AT 28TH MILE POST	SD4480053860	E
North West	86000830	MISC - RIBBLE ESTUARY AT 29TH MILE POST	SD4480053860	E
North West	86000829	MISC - RIBBLE ESTUARY AT 30TH MILE POST	SD4480053860	E
North West	86000828	MISC - RIBBLE ESTUARY AT 31ST MILE POST	SD4480053860	E
North West	86000827	MISC - RIBBLE ESTUARY AT 32ND MILE POST	SD4480053860	E
North West	86000826	MISC - RIBBLE ESTUARY AT 33RD MILE POST	SD4480053860	E
North West	86000825	MISC - RIBBLE ESTUARY AT 34TH MILE POST	SD4480053860	E
North West	86000824	MISC - RIBBLE ESTUARY AT 35TH MILE POST	SD4480053860	E
North West	86000823	MISC - RIBBLE ESTUARY AT 36TH MILE POST	SD4480053860	E
North West	86000822	MISC - RIBBLE ESTUARY AT 37TH MILE POST	SD4480053860	E
North West	86000821	MISC - RIBBLE ESTUARY AT 38TH MILE POST	SD4480053860	E
North West	86000820	MISC - RIBBLE ESTUARY AT 39TH MILE POST	SD4480053860	E
North West	86000819	MISC - RIBBLE ESTUARY AT 40TH MILE POST	SD4480053860	E
North West	86000818	MISC - RIBBLE ESTUARY AT 41TH MILE POST	SD4480053860	E
North West	86000817	MISC - RIBBLE ESTUARY AT 42TH MILE POST	SD4480053860	E
North West	86000816	MISC - RIBBLE ESTUARY AT 43TH MILE POST	SD4480053860	E
North West	86000815	MISC - RIBBLE ESTUARY AT 44TH MILE POST	SD4480053860	E
North West	86000814	MISC - RIBBLE ESTUARY AT 45TH MILE POST	SD4480053860	E
North West	86000813	MISC - RIBBLE ESTUARY AT 46TH MILE POST	SD4480053860	E
North West	86000812	MISC - RIBBLE ESTUARY AT 47TH MILE POST	SD4480053860	E
North West	86000811	MISC - RIBBLE ESTUARY AT 48TH MILE POST	SD4480053860	E
North West	86000810	MISC - RIBBLE ESTUARY AT 49TH MILE POST	SD4480053860	E
North West	86000809	MISC - RIBBLE ESTUARY AT 50TH MILE POST	SD4480053860	E
North West	86000808	MISC - RIBBLE ESTUARY AT 51ST MILE POST	SD4480053860	E
North West	86000807	MISC - RIBBLE ESTUARY AT 52ND MILE POST	SD4480053860	E
North West	86000806	MISC - RIBBLE ESTUARY AT 53RD MILE POST	SD4480053860	E
North West	86000805	MISC - RIBBLE ESTUARY AT 54TH MILE POST	SD4480053860	E
North West	86000804	MISC - RIBBLE ESTUARY AT 55TH MILE POST	SD4480053860	E
North West	86000803	MISC - RIBBLE ESTUARY AT 56TH MILE POST	SD4480053860	E
North West	86000802	MISC - RIBBLE ESTUARY AT 57TH MILE POST	SD4480053860	E
North West	86000801	MISC - RIBBLE ESTUARY AT 58TH MILE POST	SD4480053860	E
North West	86000800	MISC - RIBBLE ESTUARY AT 59TH MILE POST	SD4480053860	E
North West	86000799	MISC - RIBBLE ESTUARY AT 60TH MILE POST	SD4480053860	E
North West	86000798	MISC - RIBBLE ESTUARY AT 61TH MILE POST	SD4480053860	E
North West	86000797	MISC - RIBBLE ESTUARY AT 62TH MILE POST	SD4480053860	E
North West	86000796	MISC - RIBBLE ESTUARY AT 63TH MILE POST	SD4480053860	E
North West	86000795	MISC - RIBBLE ESTUARY AT 64TH MILE POST	SD4480053860	E
North West	86000794	MISC - RIBBLE ESTUARY AT 65TH MILE POST	SD4480053860	E
North West	86000793	MISC - RIBBLE ESTUARY AT 66TH MILE POST	SD4480053860	E
North West	86000792	MISC - RIBBLE ESTUARY AT 67TH MILE POST	SD4480053860	E
North West	86000791	MISC - RIBBLE ESTUARY AT 68TH MILE POST	SD4480053860	E
North West	86000790	MISC - RIBBLE ESTUARY AT 69TH MILE POST	SD4480053860	E
North West	86000789	MISC - RIBBLE ESTUARY AT 70TH MILE POST	SD4480053860	E
North West	86000788	MISC - RIBBLE ESTUARY AT 71TH MILE POST	SD4480053860	E
North West	86000787	MISC - RIBBLE ESTUARY AT 72TH MILE POST	SD4480053860	E
North West	86000786	MISC - RIBBLE ESTUARY AT 73TH MILE POST	SD4480053860	E
North West	86000785	MISC - RIBBLE ESTUARY AT 74TH MILE POST	SD4480053860	E
North West	86000784	MISC - RIBBLE ESTUARY AT 75TH MILE POST	SD4480053860	E
North West	86000783	MISC - RIBBLE ESTUARY AT 76TH MILE POST	SD4480053860	E
North West	86000782	MISC - RIBBLE ESTUARY AT 77TH MILE POST	SD4480053860	E
North West	86000781	MISC - RIBBLE ESTUARY AT 78TH MILE POST	SD4480053860	E
North West	86000780	MISC - RIBBLE ESTUARY AT 79TH MILE POST	SD4480053860	E
North West	86000779	MISC - RIBBLE ESTUARY AT 80TH MILE POST	SD4480053860	E
North West	86000778	MISC - RIBBLE ESTUARY AT 81TH MILE POST	SD4480053860	E
North West	86000777	MISC - RIBBLE ESTUARY AT 82TH MILE POST	SD4480053860	E
North West	86000776	MISC - RIBBLE ESTUARY AT 83TH MILE POST	SD4480053860	E
North West	86000775	MISC - RIBBLE ESTUARY AT 84TH MILE POST	SD4480053860	E
North West	86000774	MISC - RIBBLE ESTUARY AT 85TH MILE POST	SD4480053860	E
North West	86000773	MISC - RIBBLE ESTUARY AT 86TH MILE POST	SD4480053860	E
North West	86000772	MISC - RIBBLE ESTUARY AT 87TH MILE POST	SD4480053860	E
North West	86000771	MISC - RIBBLE ESTUARY AT 88TH MILE POST	SD4480053860	E
North West	86000770	MISC - RIBBLE ESTUARY AT 89TH MILE POST	SD4480053860	E
North West	86000769	MISC - RIBBLE ESTUARY AT 90TH MILE POST	SD4480053860	E
North West	86000768	MISC - RIBBLE ESTUARY AT 91TH MILE POST	SD4480053860	E
North West	86000767	MISC - RIBBLE ESTUARY AT 92TH MILE POST	SD4480053860	E
North West	86000766	MISC - RIBBLE ESTUARY AT 93TH MILE POST	SD4480053860	E
North West	86000765	MISC - RIBBLE ESTUARY AT 94TH MILE POST	SD4480053860	E
North West	86000764	MISC - RIBBLE ESTUARY AT 95TH MILE POST	SD4480053860	E
North West	86000763	MISC - RIBBLE ESTUARY AT 96TH MILE POST	SD4480053860	E
North West	86000762	MISC - RIBBLE ESTUARY AT 97TH MILE POST	SD4480053860	E
North West	86000761	MISC - RIBBLE ESTUARY AT 98TH MILE POST	SD4480053860	E
North West	86000760	MISC - RIBBLE ESTUARY AT 99TH MILE POST	SD4480053860	E
North West	86000759	MISC - RIBBLE ESTUARY AT 100TH MILE POST	SD4480053860	E

Region/Grda Sias	URN	Sampling Point Name	NOR	Est/Coa
Anglian	82M01	R OUSE THE POINT KINGS LYNN	TF6010023400	E
Anglian	82M45	THE WASH TEEOTAL CHANNEL	TF6610033200	E
Anglian	BE28	R BLACKWATER HERONS POINT	TF6050001800	E
Anglian	BE33	R BLACKWATER FULL BRIDGE	TF6050001800	E
Anglian	CE17	R CROUCH BATTLE BRIDGE	TF6050001800	E
Anglian	HCE11	WATHAM HAVEN CUT END LOW SLACK	TF3804013000	E
Anglian	HUMB40M	R HUNTER NEW HOLLAND - MID SHORE	TM0795024820	E
Anglian	HUMB80M	R HUNTER & KILLINGHOLME - UPPER SHORE	TM1870017500	E
Anglian	HW3202	BRAMBLE CREEK BRAMBLE ISLAND STAGE	TM2211026120	E
Anglian	NE13	R COLNE RIVER FERRY	TM0323021730	E
Anglian	ORW100	R ORWELL WOOLVERSTONE MARINA	TM1940031900	E
Anglian	ORW135	R ORWELL LANDGUARD POINT FELIXSTOWE	TM2825031250	E
Anglian	RE08	R ROACH EAST END PAGLESHAM	TM0480020700	E
Anglian	SE08	R STOUR OF PARKESTON QUAY	TM2358033000	E
Anglian	SE102	R STOUR OF PARKESTON QUAY	TM2358033000	E
Midlands	00004510	1st Pylon d/s Lydney WTW	SO63150035	E
Midlands	00006782	PURTON (MUD)	SO67300450	E
Midlands	00007012	d/s Purton WTW	SO68800442	E
Midlands	00015205	Lower Rias	SO68151825	E
Midlands	00015785	Upper Rias	SO68751845	E
North	42500120	NORTH SEA AT CAMBOIS	N230808434	E
North	42500125	WIPPET TISSUE AT SHORELINE	N231108880	E
North	43500440	LLOYDS HAILING STATION	N234408330	E
North	43500442	RIVER TYNE AT HEBBURN	N234408330	E
North	43500443	RIVER TYNE AT HEBBURN	N234408330	E
North	44500024	RIVER TYNE AT COCKEN BRIDGE	N234408330	E
North	45400822	RED CAR JETTY	N234408330	E
North	45400830	RIVER TYNE AT SMITHS DOCK	N234408330	E
North	45400831	RIVER TYNE AT SMITHS DOCK	N234408330	E
North	45400832	HAVERTON HILL	N234408330	E
North	45400833	GREATHEAM CREEK LAUNGS BASIN	N234408330	E
North	45400834	GREATHEAM CREEK AT LAUNGS BASIN	N234408330	E
North	49000043	BOULBY POTASH MINES (STATION 148)	N277526230	E
North	49100039	ALEXANDRA DOCK	TA12320070	E
North	49100171	HUMBER AT BROUGH	SE033702810	E
North	49000223	MERSEY ESTUARY AT EGREMENT	SD122741981	E
North	49002837	MERSEY ESTUARY AT BOUY C21 HELICOPTER PS	SD298168801	E
North	49003584	RIBBLE ESTUARY AT 571 MILE POST	SD430385644	E
North	49003585	RIBBLE ESTUARY AT 50TH MILE POST	SD355000293	E
North	49003595	WYRE ESTUARY AT WARDLEY'S CREEK	SD336924708	E
North	49003634	WYRE ESTUARY AT WYTH EMB	SD343734529	E
North	49004448	KEST ESTUARY AT THE KENT VIADUCT	SD345137944	E
North	49004449	LEVEN AT THE LEVEN VIAD	SD332517814	E
North	49004602	LEVEN US CARTER POOLING IN CHAPEL ISLAND	SD325517687	E
North	49005230	IRISH SEA AT TOW HURD ROCK NEAR ALBERTS	NO3650014260	E
North	49005857	WAVER ESTUARY AT THE RAILWAY CUTTING	NY180756178	E
North	49010744	IRISH SEA AT WORKINGTON WYWH	NX972803188	E
North	49010745	IRISH SEA AT PARTON LULLYHALL CUTFALL	NX662502118	E
South	60405107	RIVER PIDDLE D/S KEYSWORTH SWY	8Y937168840	E
South	60505217	POOLE HARBOUR FOUR (POOLE BRIDGE)	SD200900400	E
South	60100418	RIVER PARRETT AT BURNHAM YACHT CLUB	SY361608850	E
South	60010593	RIVER PARRETT D/S BRIDGWATER SWY	SY363003880	E
South	70810444	RIVER EXE 250M D/S COUNTESS WEAR SWY	SK950009680	E
South	70810456	EXMOUTH OUTFALL AT SURFACE BOIL	SV938507960	E
South	70810459	RIVER DART 250M D/S TOTNES SWY	SK978506000	E
South	70810811	RIVER DART 250M D/S SURF BOIL	SK978506000	E
South	73315115	LYNCHMOUTH MARION GARDENS SURFACE BOIL	SB734002020	E
South	61110170	PLYM ESTUARY D/S MARSH MILLS SWY	SD200106820	E
South	61111142	PLYMOUTH (RADFORD) SWY SURFACE BOIL	SD301002255	E
South	61210344	PLYMOUTH CENTRAL SWY SURFACE BOIL	SA430693400	E
South	61410305	WEY LOOSE RIVER 250M D/S LOOSE SWY	SK124405800	E
South	61714668	PARNTWY SWY SURFACE BOIL	SK048305080	E
South	62218390	HAYLE NEW SURFACE BOIL	SW552304380	E
South	62514920	100M FROM TOWAN HEAD OF SURF BOIL	SW622303050	E
South	60010175	SE STOFF AWRMIGH	SY161300010	E
South	60016127	SE STOFF AWRMIGH THROUGH WATER	SY161300080	E
South	EB800760	SEVERN ESTUARY ADJ W-B M (8 ROCK) OF	SY370005870	E
South	E0000358	SEDIMENTS D/S TONABRIDGE	TO600204650	E
South	E0000445	MOTNEY HILL - MUSSEL TISSUE	TR83208910	E
South	E0000487	Dover & Palsgrave WYWH D/S Sediment	TR338903825	E
South	E0011768	SWALE CLIFF SWY WYCAHAPLE F9 HILL SEDIMENT	TR32648337	E
South	E0011769	SWALE CLIFF SWY SEDIMENT	TR32648337	E
South	E0017183	SITTINGBOURNE SWY DSD SEDIMENT	TY01268478	E
South	E0017184	AYLESFORD SWY DSD SEDIMENT	TY01765638	E
South	E0017186	AYLESFORD DSD SEDIMENT	TY01765638	E
South	E0017170	GROVEHURST ENERGY DSD SEDIMENT (20)	TY021181708	E
South	E0017171	GROVEHURST ENERGY DSD ASH CARRIAGE	TY020506052	E
South	E0017172	POWERGEN KINGS NORTH PS DSD SEDIMENT	TY021077580	E
South	E0017173	POWERGEN GRAIN POWER STATION DSD SEDIMENT	TY089307460	E

Appendix 8 - NMS Customer Group Strategy for Coastal Sensitive Area Assessment,
Candidate and Existing Sensitive Area Site Names by Region.

URBAN WASTE WATER TREATMENT & NITRATE DIRECTIVES

Sensitive Areas (eutrophic) and "Polluted Waters" (eutrophic)

A Strategy from the National Marine Service to Deliver Marine Monitoring for Sensitive Area Assessments in Coastal Waters

Introduction

In December 1998 an advice note was published as an Annex to the Environment Agency Environmental Monitoring Programme providing guidance to Regions for the assessment of candidate Sensitive Areas. As a result of this advice note a wide diversity of approaches were adopted by the Regions. The inconsistency of approach was highlighted at the National Marine Services Client Board in 1999. The issue was referred back to the National Marine Service Customer Group with a view to agreeing a common approach, in particular with respect to the Coastal Candidate Sensitive Areas of which there were 23 - 4 in NE, 6 in Anglian, 11 in Southern and 2 in NW (see Figure 1). The diversity of approach was discussed at a number of meetings at which it was decided to convene a sub-group of the affected regions to resolve issues of consistency.

General Strategy

The following general approach was agreed for the assessment of coastal candidate Sensitive Areas:

- A consistent approach to the sample collection and data analysis for this monitoring based on previously agreed strategy proposed by North West Region.
- Monitoring December-February and May - September on a monthly basis as specified in the Sensitive Area advice note i.e. concentrating on winter nutrients and summer chlorophylls.
- Parameters: continuous nutrients (including silicate, nitrite, nitrate, ammonia and phosphate) and during summer months spot chlorophyll samples will be collected at selected locations within the vicinity of the discharge points and at control sites more distant. Chlorophyll samples should also be collected at strategic locations to reflect major riverine inputs. Spot plankton samples will also be routinely collected and preserved for later confirmatory analyses of bloom species should the data reveal significant algal activity. The minimum performance standards for nutrients are set out in Appendix 1.
- Any observational data on unusual occurrences such as evidence of algal blooms (discolouration of the water e.g. red tides or foam) will be noted and recorded photographically giving indication of sea and weather conditions prior to and during any such occurrences. Some blooms may not be visible from direct observation. In addition to observational data a fluorimeter will also be used. The fluorimeter will be used as a prompt for taking additional plankton samples. In such instances additional water samples will be collected for confirmation of any bloom species. The

Chloroflow (*in-vivo* photometric analysis) will also be used for continuous measurement of chlorophyll in NE, Anglian and Southern. All nutrients will be analysed on board the vessel.

- Nutrient and chlorophyll data will be supplemented with supporting determinands dissolved oxygen, temperature, conductivity and a consistent measure of turbidity. The minimum performance standards for these determinands are set out in Appendix 1.
- All analyses will be subject to rigorous QA and AQC by the operations and quality teams within NMS as set out in the NMS procedures and quality manual. QUASIMEME participation will be included in the QA activities. All standards will be prepared in a UKAS accredited lab.

AQC for On board Continuous Nutrient Measurements.

For all analysis carried out on board the activities will be included,

- In house AQC standards will be included with each batch of analysis, such standards will be derived from a source that is traceable to national standards. These will be prepared in-house using facilities that are UKAS accredited or purchased from a supplier certified to ISO 9000. AQC standards will be independent of the calibration standards both in terms of raw material and weighing equipment used during preparation. Detailed description of the procedures and action rules are in the NMS Nutrients AQC Manual.
- Recovery of added spike will be determined in each batch of analysis using a matrix that is representative of that of actual samples.
- Participation in QUASIMEME Laboratory Performance Studies.

For online continuous analysis,

- Independent spot samples will be taken at selected sites specified by the customer and where unusual results are encountered. These will be preserved and then analysed at a later date either on board or by a shore-based laboratory as appropriate.

Site locations and tracks

Figure 2 shows the proposed site locations for spot chlorophylls and the route of the continuous tracks in each of the coastal stretches designated as candidates. Tracks are positioned so that they are routed through the effluent plumes. This will be important to consider when data assessment is undertaken particularly any statistics derived from the data to assess the nutrient status of the water.

Data Analysis

All data derived from continuous analyses will be archived on an ACCESS database at National Marine Service offices in Peterborough. Spot chlorophyll data will be stored on regional databases. Any biological results from plankton sample analysis will be stored on the biological database, UNICORN.

Standard reports will include excel spreadsheets in a standard format. Graphical representation of the data will be in the form of track concentration maps and nutrient data for both on-line and spot samples will be plotted as time series charts and annotated with site name. These will be available to the client.

Statistical analyses will be undertaken once a standard statistical assessment technique has been agreed. All of the above will be formally reported in hard copy and electronically as required.

Urban Waste Water Treatment Directive: Existing Sensitive Area Designations

There are 80 existing designations across England & Wales. Of those 80 designations 5 are in tidal waters.

Region	Site Name	Designation	Year	Extension
South West	Taw Estuary	SA(E) ^{*1}	1998	
	Truro/ Tresillian/ Fal Estuaries	SA(E) ^{*1}	1998	
Southern	Chichester Harbour	SA(E)	1998	
	Langstone Harbour	SA(E)	1998	
Wales	Tawe Estuary (Impoundment)	SA(E)	1998	

Note:

^{*1} These Sensitive Areas are subject to further monitoring for the 2001 revue in order to ascertain whether they should also receive Polluted Waters (Eutrophic) status.

Urban Waste Water Treatment Directive Former HNDA's being considered as candidate Sensitive Areas in 2001

Region	Site Name	Qualifying Discharge
Anglian	Clacton	Clacton STW*
	Felixstowe/Shotley	Shotley STW*
	Great Yarmouth	Caister STW*
	Ingoldmells	Ingoldmells STW
	Jaywick	Jaywick STW*
	Lowestoft	Lowestoft STW*
North East	Hendon	Hendon STW*
	Horden	Horden STW*
	Langbaugh	Marske STW*
	Seaton Carew	Seaton Carew STW*
North West	Braystones	Braystones STW
	North Wirral	Meols STW
Southern	Brighton	Brighton (Portobello) STW*
	Broadstairs/Margate	Broadstairs STW
		Margate STW
	Dover/Folkestone/Hythe	Dover STW
		Folkestone STW
		Hythe STW
	Eastbourne	Eastbourne (Langley) STW*
	Hastings	Combe Haven STW*

		Bulverhythe STW*
	Littlehampton	Littlehampton STW
	Portslade (Shoreham)	Shoreham STW
	Sandown	Sandown STW
	Seaford Bay	Newhaven/Seaford STW*
	Whitstable/Swalecliffe	Swalecliffe STW*
	Worthing	Worthing STW

Key

* Indicates that the treatment works failed its Comprehensive Study in 1998

Urban Waste Water Treatment Directive: New sites being considered as candidate Sensitive Areas in 2001

Region	Site Name	Proposed Designation	Qualifying Discharge	
			Direct	Indirect
Anglian	Colne Estuary	SA(E)	Colchester STW	Halstead STW
	Great Ouse Estuary	SA(E)	King's Lynn STW	Attleborough STW
				Bedford STW
				Biggleswade STW
				Brackley STW
				Bury St Edmunds STW
				Cambridge STW
				Chalton STW
				Clifton STW
				Cotton Valley STW
				Dunstable STW
				Ely STW
				Flitwick STW
				Haslingfield STW
				Hitchin STW
				Huntingdon STW
				Leighton Linlade STW
				Letchworth STW
				Maids Moreton STW
				March STW
				Mildenhall STW
				Newmarket STW

Region	Site Name	Proposed Designation	Qualifying Discharge	
			Direct	Indirect
				Over STW
				Poppy Hill STW
				RAF Lakenheath STW
				Royston STW
				Saffron Walden STW
				Sandy STW
				Sawston STW
				Soham STW
				St Ives STW
				St Neots STW
				Thetford STW
				Towcester STW
				Uttons Drove STW
				Watton STW
				Whittlesey STW
	Nene Estuary	SA(E)	Wisbech STW	Broadholme STW
				Corby STW
				Flag Fen STW
				Great Billing STW
				Raunds STW
				Whilton STW
	Old West & Ely Ouse	SA(E)	Ely STW	Attleborough STW
				Bury St Edmunds STW
				Mildenhall STW

Urban Waste Water Treatment Directive: New sites being considered as candidate Sensitive Areas in 2001

Region	Site Name	Proposed Designation	Qualifying Discharge	
			Direct	Indirect
North East				Newmarket STW
				Over STW
				Soham STW
				Thetford STW
	Witham Estuary	SA(E)		Heacham STW
			Spalding STW	Deepings STW
				Market Harborough STW
				Stamford STW
			Boston STW	Anwick STW
				Lincoln STW
				Marston STW
				North Hykeham STW
	Northumberland Coast - Budle Bay vicinity	PW(E)		
	Northumberland Coast - Fenham Flats vicinity	PW(E)		
South West	River Tees Estuary (Seal Sands)	SA(E)	Bran Sands STW	
	River Tees Estuary (Upper)	SA(E)	Bran Sands STW	
	River Wansbeck Estuary	SA(E)		Morpeth STW
	Christchurch Harbour	SA(E)		Christchurch STW
	Dart Estuary	SA(E)		Totnes STW
	Exe Estuary	SA(E)		Countess Wear STW
	Fowey Estuary	PW(E)		
	Poole Harbour	SA(E)		Poole STW

Region	Site Name	Proposed Designation	Qualifying Discharge	
			Direct	Indirect
EA-Wales				Wareham STW
	Torridge Estuary	SA(E)		Bideford STW
	Carmarthen Bay		Tenby STW	Parc y Splotts STW
	Dee Estuary	SA(E)	Chester STW	Connah's Quay STW
			Flint STW	Neston STW
			Greenfield STW	
			Heswall STW	
			Queensferry STW	
	Lougher Estuary	SA(E)	Gowerton STW	Garnswllt STW
			Llanelli (Bynea) STW	
			Llanant STW	
	Milford Haven	SA(E)	Milford Haven STW	
			Merlins Bridge STW	
			Pembroke Dock STW	

Appendix 9 - Strategic Environmental Assessment Directive; Summary of Implications

Briefing Note

EC Directive on the Assessment of the Effects of Certain Plans and Programmes on the Environment ("SEA Directive")

1.0 Background and Timescales

DETR expect adoption to take place around May / June 2001 with member states having 3 years to transpose the Directive into national law.

It is proposed that the Directive is reviewed after five years and if appropriate, amended. Further subsequent reviews are planned at seven year intervals.

Stated Environmental objectives:-

- Provide a more consistent decision making framework which includes environmental information.
- Promote more sustainable and effective solutions "...promoting sustainable development."
- Contribute to a high level of protection of the environment.

2.0 Summary of Directive

- Applies to certain plans and programmes, as well as their modifications (but not policies)
 - which are required by legislative, regulatory or administrative provisions
 - which fall within the following sectors:- agriculture, forestry, fisheries, energy, industry, transport, waste management, water management, telecommunications, tourism, town and country planning or land use

And which :-
set a framework for future development consent of EIA (EC 85/337/EEC) projects and/or require assessment under the Habitats Directive (92/43/EEC).

Or which:-
member states determine are likely to have significant effects.
- SEA is not required for plans and programmes solely concerned with defence, civil emergency, finance or budgets.
- Environmental impacts and views of stakeholders to be taken into account during preparation and before adoption.
- To be integrated with existing procedures in member states – details of implementation to be determined by member states.
- Consultation and information provision:-
 - Information to be provided to the public, on:-
 - screening decision (whether or not SEA is to be undertaken) with reasons
 - reasons for adoption of preferred option over alternatives, how environmental considerations and consultations were taken into account
 - mitigation and monitoring measures
 - Consultation with relevant authorities and the public required at:-
 - scoping stage
 - draft plan stage

- Sufficient time to be allowed for responses.
- Reasonable alternatives should be identified, described and evaluated
- Monitoring of effects of implementation, effectiveness of mitigation measures and remedial actions required
- Where plans & programmes form part of a hierarchy SEA should be carried out but with a view to avoid duplication of assessment
- "Environmental Report" to be produced to include:-
 - Details of contents and objectives of the plan / programme and links with others;
 - Environmental baseline and projection re do nothing option;
 - Existing environmental problems eg related to SACs, SPAs;
 - Details of relevant international, European or member state environmental protection objectives and how taken into account in plan / programme;
 - Environmental assets likely to be significantly affected;
 - Reasonable alternatives and details of how preferred option selected;
 - Uncertainty;
 - Likely significant effects on the environment including, in particular, on biodiversity, population human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage, landscape and the interrelationship between the above factors;
 - Significant effects considered should include secondary; cumulative; synergistic; short, medium and long term; permanent; temporary; positive and negative effects;
 - Mitigation measures;
 - Monitoring proposals re environmental impacts and effectiveness of mitigation measures;
 - Non technical summary.

3.0 Current and future Agency plans & programmes likely to fall within requirements of Directive

This table summarises the Agency plans and programmes thought likely to fall within the requirements of the forthcoming Directive. The number of plans, distribution and frequency of production and estimated costs of development are also included.

Type of plan, strategy or programme	Number of plans, distribution and frequency of production	Estimated cost of plan development
Local Environment Agency Plans (LEAPs) Contact: Roger Vallance, Bristol	132 LEAPs across England & Wales. The long-term future of LEAPs is being discussed (possibly greater potential for integration with Community Strategies in future)	132 costing approximately £8M to produce (including £2M publishing costs).
Catchment Flood Management Plans (CFMPs) Contact: Trevor Linford, Bristol	80 - 100 CFMPs in total across England & Wales. Review frequency probably 5-6 years (depending on other plans, eg Water Framework Directive)	Costing ~£2M (in total) over the next 2 years (100% grant aided by MAFF)
Flood & Coastal Defence Strategies	Unknown number of strategies across England & Wales,	Costing ~£1M per year over the next 3 years (receiving

Contact: Mike Brewer, Warrington	covering coastal & fluvial environments	local grant rate from MAFF)
Flood & Coastal Defence Capital Programme Contact: Mike Brewer, Warrington	1 National Programme	Programme delivers >£100M per of works year
Flood & Coastal Defence Operational Maintenance Programmes (watercourse & asset maintenance) Contact: John Garrod, Bristol	26 programmes per year across England & Wales (ie. 1 programme per Area)	Programmes deliver up to £86M of 'works' per year
National and Regional Water Resources Strategies Contact: Aileen Kirmond, Bristol	1 National Strategy plus 8 Regional Strategies (prepared every 5yrs and reviewed annually)	Costing nationally ~ £350K over 2 years plus ~£600K staff time to prepare, plus ~£70K per year to review.
Catchment Abstraction Management Strategies (CAMS) Contact: Aileen Kirmond, Bristol	136 CAMS in total to be prepared over a 6 year period	Costing ~£1.9M in year 2001- 02, and ~£2.7M in year 2002-03.
Recreation Strategies and Recreation Action Plans Contact: Don Vickers, Reading	1 Strategy per Region reviewed every 10 years (totalling 8 strategies nationally) plus 1 Action Plan per Region (totalling 8 nationally) reviewed every 3-5 years	Costing ~15-25K per Region per year
Navigation (Waterways) Plans Contact: Eileen McKeever, Bristol	A number of plans for local watercourse (reviewed annually).	Costing ~£20K nationally per year
River Basin Management Plans Contact: Dave Foster		
Fisheries Action Plans (FAPs) Contact: Adrian Taylor, Bristol	About 6 FAPs are being piloted prior to the FAP concept being rolled out (planned to produce 1 FAP for each LEAP area ie 132 nationally)	Pilot aims to establish costs but estimated that will cost about £650k

NB: The Agency is comprised of 8 Regions (including Environment Agency Wales), and 26 Areas.

Gerard Stewart
NCRAOA, 06/03/2001

Marine Special Areas of Conservation for England and Wales

SITE CODE	SITE NAME	SITE STATUS	Grid References	COUNTRY
UK0030076	Aide, Ore and Butley Estuaries	cSAC	TM 4000 5000	England
UK0013104	Benacre to Easton Bavents Lagoons	cSAC	TM 5182 8267	England
UK0012570	Braunton Burrows	cSAC	SS 4585 3398	England
UK0017076	Chesil and the Fleet	cSAC	SY 6340 7813	England
UK0013031	Drigg Coast	cSAC	SD 0786 9589	England
UK0013690	Essex Estuaries	cSAC	TR 0217 8949	England
UK0013112	Fal and Helford	cSAC	SW 8435 3047	England
UK0013036	Flamborough Head	cSAC	TA 2635 6900	England
UK0013694	Isles of Scilly Complex	cSAC	SV 8780 1110	England
UK0013114	Lundy	cSAC	SS 1365 4615	England
UK0013027	Morecambe Bay	cSAC	SD 3563 6759	England
UK0019838	North Norfolk Coast	cSAC	TF 8133 4464	England
UK0014780	Orfordness - Shingle Street	cSAC	TM 4433 4889	England
UK0013111	Plymouth Sound and Estuaries	cSAC	SX 4483 5993	England
UK0017073	Solent and Isle of Wight Lagoons	cSAC	SZ 6109 9686	England
UK0030059	Solent Maritime	cSAC	SU 5000 0000	England
UK0030061	South Wight Maritime	cSAC	SZ 5000 7500	England
UK0013107	Thanet Coast	cSAC	TR 3429 7042	England
UK0017075	The Wash and North Norfolk Coast	cSAC	TF 5568 3991	England
UK0030170	Humber Estuary	pSAC	TA 0430 2350	England
UK0030292	Tweed Estuary	pSAC	NT 9930 5310	England
UK0017072	Berwickshire and North Northumberland Coast	cSAC	NT 9900 5330	England & Scotland
UK0013025	Solway Firth	cSAC	NY 0821 6275	England & Scotland
UK0030131	Dee Estuary/ Aber Dyfrdwy	pSAC	SJ 2200 8000	England & Wales
UK0013030	Severn Estuary/ Môr Hafren	pSAC	ST 3000 7000	England & Wales
UK0030114	Bae Cemlyn/ Cemlyn Bay	cSAC	SH 3310 9330	Wales
UK0012712	Cardigan Bay/ Bae Ceredigion	cSAC	SN 2312 6538	Wales
UK0020020	Carmarthen Bay and Estuaries/ Bae Caerfyrddin ac Aberoedd	cSAC	SS 4643 9916	Wales
UK0020025	Glannau Môn (Cors heli)/ Anglesey Coast (Saltmarsh)	cSAC	SH 3996 6675	Wales
UK0014787	Limestone Coast of South West Wales/ Arfordir Calchfaen de Orllewin Cymru	cSAC	SR 9378 9456	Wales
UK0013116	Pembrokeshire Marine/ Sir Benfro Forol	cSAC	SM 6698 1389	Wales
UK0013117	Pen Llyn a'r Samau/ Llyn Peninsula and the Samau	cSAC	SH 4886 1312	Wales
UK0030202	Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay	pSAC	SH 5500 8200	Wales

pSAC Proposed Special Area of Conservation
cSAC Candidate Special Area of Conservation

Habitat and Species Action Plans: Summary Actions for regulatory authorities

BAP Habitats

ID	Broad habitats	Priority habitat	Associated sp	Scientific species name	Marine/coastal
1	Supralittoral rock	Maritime cliff and slopes	vegetated cliffs and lichen dominated cliffs		coastal
2	Supralittoral sediment	Coastal sand dunes			coastal
3	Supralittoral sediment	Machair			coastal
4	Supralittoral sediment	Coastal vegetated shingle			coastal
5	Littoral rock, inshore sublittoral rock	Littoral and sublittoral chalk			marine
6	Littoral rock	Sabellaria alveolata reefs			marine
7	Littoral sediment	Coastal saltmarsh			coastal
8	Littoral sediment	Mudflats			marine
9	Littoral sediment	Sheltered muddy gravels			
10	Inshore sublittoral rock	Sabellaria spinulosa reefs			marine
11	Inshore sublittoral rock	Tidal rapids			marine
12	Inshore sublittoral rock	Modiolus modiolus beds	Horse mussel beds		marine
13	Inshore sublittoral sediment	Seagrass beds	Zostera beds		
14	Inshore sublittoral sediment	Maerl beds		Phymatolithon calcareum	marine
15		Maerl beds		Lithothamnion glaciale	
16		Maerl beds		Lithothamnion coralloides	
17	Inshore sublittoral sediment	Saline lagoons	Starlet sea anemone	Nematostella vectensis	
18		Saline lagoons	Ivell's sea	Edwardsia	

Habitat and Species Action Plans: Summary Actions for regulatory authorities

19		Saline lagoons	anemone lagoon sandworm	ivelli Armandia cirrhosa
20		Saline lagoons	the hydroid	Clavopsella navis
21		Saline lagoons	lagoon sand shrimp	Gammarus insensibilis
22		Saline lagoons	the lagoon seaslug	Tenellia adspersa
23		Saline lagoons	Baltic stonewort	Chara baltica
24		Saline lagoons	bearded stonewort	Chara canescens
25		Saline lagoons	foxtail stonewort	Lamprothamnium papulosum
26		Saline lagoons	bird's nest stonewort	Tolypella nidifica
27	Inshore sublittoral sediment	Mud habitats in deep water	a seapen	Funiculina marine quadrangularis
28		Mud habitats in deep water	a sea squirt	Styela gelatinosa
29	Inshore sublittoral sediment	Serpulid reefs	Serpula vermicularis reefs	marine
30	Inshore sublittoral sediment, offshore shelf sediment	Sublittoral sand and gravels		marine
31	Continental shelf slope	Lophelia pertusa reefs	an ahermatypic coral	marine

BAP Species in tidal waters

Taxa	Common name	Scientific name	Single or grouped plan
Mammals	Harbour Porpoise	Phocoena phocoena	Single
Mammals	Baleen whales		Grouped
Mammals	Small dolphins		Grouped
Mammals	Toothed whales (except small dolphins)		Grouped
Reptiles	Marine turtles		Grouped
Fish	Basking Shark	Cetorhinus maximus	Single
Fish	Common skate	Raja batis	Single
Fish	Commercial marine fish		Grouped
Fish	Deep-water fish		Grouped

Habitat and Species Action Plans: Summary Actions for regulatory authorities

Molluscs	a fan shell	Atrina fragilis	Single
Molluscs	Native oyster	Ostrea edulis	Single
Molluscs	Northern Hatchet shell	Thyasira gouldi	Single
Sea anemones	Sea-fan anemone	Amphianthus dohrnii	Single
Sea anemones	Ivell's sea anemone	Edwardsia ivelli	Single
Sea anemones	Starlet sea anemone	Nematostella vectensis	Single
Corals	Pink sea-fan	Eunicella verrucosa	Single
Corals	Sunset cup coral	Leptopsammia pruvoti	Single
Algae	a red alga	Anotrichium barbatum	Single
Algae	a brown alga	Ascophyllum nodosum	Single
		ecad mackaii	

Examples of Actions

NOTE: The list below shows all of the current actions and may differ from the list of actions in the published plans, i.e. new actions have been added, while others have been dropped or revised. The species plan list is incomplete.

Habitat Action Plans

Coastal saltmarsh

5.1.3

Promote awareness and uptake of agri-environment schemes which involve the management and creation of saltmarsh. (ACTION: CCW, DANI, EA, EN, MAFF, SNH)

5.1.4

Take account of available mechanisms for the management and creation of saltmarsh when developing Shoreline Management Plans and strategies for the management of coastlines (ACTION: EA, LAS)

5.1.5

Initiate the preparation of strategic flood defence management plans in estuaries by 2003 which determine what could be achieved sustainably in terms of saltmarsh creation. (ACTION: DANI, EA, NAW, SE)

5.1.6

Investigate opportunities to incorporate into cost/benefit analyses for flood defence schemes the non-use value of saltmarsh created as part of such schemes. (ACTION: DANI, DoE(NI), EA, MAFF, NAW, SE)

5.2.2

Ensure that, as far as possible, coastal defence or other construction works avoid any disruption of coastal or other natural processes which might lead to the loss of saltmarsh. (ACTION: DANI, DETR, DoE(NI), EA, LAS, MAFF, NAW, SE)

5.3.1

Promote and develop demonstration sites for the management and creation of saltmarsh and disseminate results. (ACTION: CCW, DANI, EA, EHS, EN, MAFF, NAW, SE, SNH)

5.3.2

Encourage the appropriate management of saltmarsh through the production and dissemination of guidance material by 2005. (ACTION: CCW, EA, EHS, EN, SNH)

5.3.3

Establish a technical expert group by 1999 to collate and disseminate information relating to the relationship between saltmarshes, nature conservation and flood defence. (ACTION: EA, EN, MAFF)

5.3.4

Make use of the potential provided by existing estuary management partnerships in taking forward the actions of this plan. (ACTION: CCW, DETR, EA, EN, LAS, MAFF, SNH)

5.3.6

Habitat and Species Action Plans: Summary Actions for regulatory authorities

The often intimate relationship between saltmarsh vegetation and other coastal habitats such as shingle structures, sand dunes, machair and intertidal mudflats means that the management of saltmarshes can rarely be considered in isolation. Managed realignment of flood defences and saltmarsh habitat creation where existing defences are not sustainable in the long term will, in some places, involve loss of freshwater habitats (e.g. grazing marsh and reedbeds) behind sea walls. Some of these habitats may be within designated sites. Implementation groups for the relevant HAPs should be advised on how to make appropriate provision for compensatory habitat creation. (ACTION: GCW, EA, EN, SNH)

5.5.11

Put measures in place to clarify the current and future rates of saltmarsh loss enabling a review of the targets of this plan by 2004. (ACTION: GCW, EA, EN, MAFF, SNH)

5.5.13

Continue development of the use of remote sensing for monitoring soft coast habitats to determine the extent and rate of change, including the identification of the highest priority areas for saltmarsh creation. (ACTION: EA, SEPA)

5.5.14

Investigate the beneficial use of fine dredged materials for promotion of saltmarsh accretion and disseminate the results. (ACTION: GCW, EA, EN, MAFF, SNH)

5.5.15

Continue research into the factors influencing the establishment of saltmarsh vegetation, and use this to develop 'best practice' methods for management. (ACTION: GCW, EA, EN, MAFF, SNH)

5.5.16

Under take research on estuary dynamics, including the effects of sediment removal in relation to its impact on saltmarsh. (ACTION: EA, MAFF, SEPA)

5.5.17

Raise public awareness of the essential mobility of saltmarsh and its value for a variety of interests including coastal processes, flood defence, fisheries, nature conservation, amenity and recreation. (ACTION: GCW, EA, EHS, EN, SNH)

Coastal sand dunes

5.5.18

Monitor and regulate water abstraction and land drainage schemes which might affect water tables in sand dune systems, and promote remedial action where necessary. (ACTION: EA, DAN, MAFF, NAV, SE)

5.5.19

Make use of the potential provided by existing estuary management partnerships in taking forward the actions of this plan. (ACTION: GCW, DEIR, EA, EN, LA, MAFF, SNH)

5.5.20

Continue research into the use of remote sensing for monitoring soft coast habitats. (ACTION: EA)

5.5.21

Promote research into the causes of falling water tables in sand dune systems. (ACTION: EA)

Coastal vegetated shingle

5.5.22

Ensure that the importance of shingle structures and offshore shingle resources is recognised in flood and coastal defence strategies and, where appropriate, encourage such strategies to contribute to the objectives and targets of this plan. (ACTION: DAN, DOE (NI), EA, MAFF, NAV, SE)

5.5.23

Allowing natural landward movement of shingle features (see 5.5.11) will, in some cases, affect other habitats such as saline lagoons, grazing marsh, fens and reedbeds, some of which will be designated sites. The implementation groups for the relevant HAPs should be advised on how to make appropriate provision for habitat creation. In some cases, breaches in shingle banks may lead to the development of saltmarsh habitats and this needs to be taken account of in the respective HAPs. (ACTION: GCW, EA, EN, SNH)

5.5.24

Continue research into the use of remote sensing for monitoring soft coast habitats including shingle structures. (ACTION: EA)

Habitat and Species Action Plans: Summary Actions for regulatory authorities

Littoral and sublittoral chalk

5.1.1

Influence the content of SMPs to recognise the dynamic nature of the littoral environment allowing, where possible, the natural processes of erosion. (ACTION: EHS, EA, LAs, MAFF)

5.1.3

Harmonise the integration of Local Environment Action Plans with the proposed Water Framework Directive so that there is a comprehensive approach to securing water quality objectives for estuaries and coastal areas. (ACTION: EA, EHS)

5.2.2

Promote the use of both statutory and non-statutory initiatives to conserve nationally and internationally important examples of littoral and sublittoral chalk habitats. (ACTION: DETR, EA, EHS, EN)

5.2.3

Encourage a presumption against littoral stabilisation works except where human life, or important natural or man-made assets, are at risk. (ACTION: EA, EHS, LAs, MAFF)

5.5.3

Implement a surveying and monitoring programme by 2003 to provide data on the changes in extent and quality of littoral and sublittoral chalk resources in England and Northern Ireland. This will enable progress towards the objectives of this plan to be assessed. The information derived from this programme should be collated in conjunction with data derived from surveying the national maritime cliff and slope resource. (ACTION: EA, EHS, EN)

Maerl beds

5.2.4

Ensure that planning for aquaculture and other operations, which may cause eutrophication and smothering does not adversely affect the conservation requirements of important maerl beds. (ACTION: CEC, DETR, EA, EHS, LAs, NAW, SE, SEPA)

Maritime cliff and slopes

5.1.1

Promote sea defence and coastal protection policies which encourage the free functioning of the coastal physical processes of maritime cliffs wherever possible. (ACTION: DANI, DoE(NI), EA, LAs, MAFF, NAW, SE)

5.3.1

Encourage by 2002 the adoption of policies and practices in the engineering management of soft cliffs which are sympathetic to the nature conservation interest, by preparing and disseminating 'best practice' guidance material. (ACTION: DANI, EA, MAFF, NAW, SE)

5.5.3

By 2003 commission a study to identify possible coastal and sea defence strategies that may be more sympathetic to the nature conservation interests of maritime cliffs, and identify stretches of coastline where such sympathetic modifications are feasible. (ACTION: DoE(NI), EA, MAFF, NAW, SE)

5.5.8

By 2003, in order to meet objective 4.3, develop an inventory of coastal defences that impact on maritime cliff and slope habitats and identify the most appropriate defences for removal. (ACTION: CCW, EA, EHS, EN, SNH)

Modiolus modiolus beds

5.2.3

Reduce inputs to coastal waters as required under international, EC and domestic pollution control obligations. (ACTION: EA, EHS, SEPA)

5.5.4

Assess the potential for damage by eutrophication or organic enrichment in enclosed systems such as sea lochs, especially where water exchange is low or where there is high localised organic or nutrient input (eg from fish farms, factories) (ACTION: CEC, DANI, EA, EHS, SE, SEPA)

Mudflats

5.1.1

Habitat and Species Action Plans: Summary Actions for regulatory authorities

Provide a clear national policy by 2000 for SMPs, land use planning and development control policy which ensures that there is no net loss of tidal flats by development, from a 1992 baseline, and that provision is made for the restoration of natural losses over the longer term. (ACTION: DETR, EA, MAFF, NAW, SE, SEPA)

5.2.2

Ensure that wherever practicable coastal defence or other construction works avoid disruption of coastal processes that might lead to a loss of, or damage to, mudflats. (ACTION: DANI, DoE(NI), EHS, EA, LAs, MAFF, NAW, SE)

5.2.3

Maintain and where possible improve estuarine and coastal water quality. (ACTION: EA, EHS, MAFF, SE, SEPA)

5.3.1

Ensure that good-practice guidance is available to shoreline management authorities on how to plan for the maintenance of mudflats in a period of rising sea level by 2000. Particular attention should be given to the use of dredged material for this purpose and the creation of new mudflats. (ACTION: DoE(NI), EA, MAFF, NAW, Port Authorities, SE)

5.5.1

Run field trials to refine and demonstrate techniques for habitat restoration and creation by 2002. Particular attention should be given to the use of dredged material for this purpose. (ACTION: CCW, EA, EHS, EN, MAFF, Port authorities, SE, SNH)

5.5.2

Continue to develop an understanding of the value of mudflats for flood and coastal defence and the holistic management of these habitats in conjunction with flood risk management. (ACTION: EA, MAFF, NAW, SE, SEPA, SNH)

5.5.4

Initiate research into sediment exchange processes between mudflats and other coastal habitats and on the dynamics of cohesive sediments in estuaries. (ACTION: CCW, EA, EHS, EN, MAFF, SE, SEPA, SNH)

5.6.1

Educate planning authorities and developers on the important functions of mudflats in estuarine and coastal systems by the preparation and dissemination of a pamphlet by 2001. (ACTION: CCW, EA, EHS, EN, MAFF, SE, SEPA, SNH)

Sabellaria alveolata reefs

5.2.1

Ensure that when considering the need for, and scope of, Environmental Impact Assessments, the needs of *S. alveolata*, (including sediment supply), are fully taken into account. (ACTION: CCW, EA, EHS, EN, LAs, SE)

Saline lagoons

5.1.2

Identify abstractions known, or likely to be adversely affecting (through reduced freshwater flows) lagoonal habitats of nature conservation importance. Abstractions should be revoked or reduced where the review identifies this as necessary. (ACTION: EA, SEPA)

5.2.3

Maintain and monitor the stable exchange of waters to and from lagoonal habitats as part of site management plans. (ACTION: CCW, EA, EN, SEPA, SNH)

5.2.5

Contribute to the different stages of producing shoreline management plans (including guidance on their preparation) to ensure that processes relevant to coastal lagoons are taken into account (ACTION: CCW, EA, EN, Local Authorities, MAFF, WO). Revised

Seagrass beds

5.2.6

Define statutory water quality objectives for coastal waters. (ACTION: EA, MAFF, SEPA)

Sheltered muddy gravels

5.2.3

Reduce inputs to coastal waters as required under international, EC and domestic pollution control obligations. (ACTION: DoE(NI), EA, SEPA)

Habitat and Species Action Plans: Summary Actions for regulatory authorities

5.5.1

Identify nutrient Water Quality (WQ) standards for nutrients that will protect this habitat, and examine the ability of existing regulatory mechanisms to ensure compliance with such standards. (ACTION: CCW, EA, EHS, EN, SEPA, SNH)

Sublittoral sands and gravels

5.2.3

Reduce inputs to coastal waters as required under international, EC and domestic pollution control obligations. (ACTION: DETR, EA, EHS, MAFF, NAW, SE, SEPA)

Tidal rapids

5.2.3

Reduce inputs to coastal waters as required under international, EC and domestic pollution control obligations. Long term monitoring strategies are also required to identify changes in water quality and the effect on the ecology of this habitat. (ACTION: DETR, EA, EHS, MAFF, NAW, SE, SEPA)

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Species Action Plans

Grouped plan for commercial marine fish

5.5.5

Revive and maintain long-term fisheries and environmental monitoring time series data. (ACTION: DANI, EA, Fisheries Departments, NERC, SEPA)

Grouped plan for marine turtles

5.1.2

Seek to improve coastal water quality, in particular by reducing marine debris which may be ingested by marine turtles. (ACTION: DANI, DETR, EA, MAFF, NAW, SE, SEPA)

Grouped plan for toothed whales

5.1.2

Seek to improve coastal water quality to standards set in EC directives and International conventions by reducing the discharge of substances which are toxic, persistent and liable to bioaccumulate, giving priority to the discharge and leaching of PCBs and organochlorines. (ACTION: EHS, EA, MAFF, NAW, SE, SEPA)

5.5.3

Support work into the effects of contaminants on toothed whale populations, including the development of indicators such as biomarkers. (ACTION: EHS, DETR, EA, JNCC, MAFF, NERC, SE, SEPA)

5.5.4

Assess rivers within the historic range in England against the results of 5.5.3, to ascertain whether the ecological requirements of the species can still be met in any of them. (ACTION: EA, EN)

5.6.1

Consider how to gain a broad constituency of views on the re-establishment of the burbot as a component of the UK biodiversity, and implement an appropriate strategy to that end. (ACTION: DETR, EA, EN, MAFF)

Melanitta nigra Common Scoter

5.1.2

Consider the adoption of improved pollution prevention and control measures, including MEHRAs, and shipping management measures. (ACTION: CCW, DETR, DTI, EA, EHS, EN, Harbour authorities, JNCC, LAs, MCA, SEPA, SNH)

5.1.3

Take forward enforcement of MARPOL limits on deliberate discharges, port waste management plans and oil spill contingency planning. (ACTION: CCW, DETR, DTI, EA, EHS, EN, Harbour authorities, JNCC, LAs, MCA, SEPA, SNH)

5.2.3

Where possible, increase the available habitat at known sites and adjacent areas. (ACTION: EA, EN)

5.5.4

Habitat and Species Action Plans: Summary Actions for regulatory authorities

Investigate the impact of boat traffic speed on grass-wrack pondweed populations. (ACTION: British Waterways, Broads Authority, EA)

5.5.6

Consider investigating the impacts of nutrient enrichment and pollution on populations of triangular club-rush and consider the value of buffer strips alongside main water courses in the vicinity of key sites. (ACTION: EA, EN, MAFF)

5.1.2

Take account of the requirements of this species in response to applications for water abstraction or sand extraction from rivers. (ACTION: EA, SEPA, SWAs)

5.2.1

Where possible, ensure that all occupied sites are appropriately managed by 2010. (ACTION: CCW, EA, EN, SEPA, SNH)

5.4.1

Advise landowners and managers of the presence of this species and the importance of beneficial management for its conservation. (ACTION: CCW, EA, EN, SEPA, SNH)

5.5.1

Undertake surveys to determine the status of this species. (ACTION: CCW, EA, EN, SEPA, SNH)

5.5.2

Conduct targeted autecological research to inform habitat management. (ACTION: CCW, EA, EN, SEPA, SNH)

5.5.3

Establish a regular monitoring programme for this species. (ACTION: CCW, EA, EN, SEPA, SNH)

5.5.4

Pass information gathered during survey and monitoring of this species to a central database so that it can be incorporated in national databases. (ACTION: CCW, EA, EN, SEPA, SNH)

5.6.1

Promote opportunities for the appreciation of this species and the conservation issues associated with its habitat. This should be achieved via articles within appropriate journals as well as by a publicity leaflet. (ACTION: CCW, EA, EN, SEPA, SNH)

5.2.1

Ensure that all occupied habitat is appropriately managed by 2008. (ACTION: EA, EN)

5.2.2

Ensure that the habitat requirements of *Synaptus filiformis* are taken into account in any development policies, plans and proposals likely to affect the River Parrett corridor. (ACTION: EA, EN, LAs)

5.5.1

Undertake surveys to determine the status of the species. (ACTION: CCW, EA, EN)

5.5.2

Conduct targeted autecological research to inform habitat management. (ACTION: EA, EN)

5.5.3

Establish a regular monitoring programme for populations along the River Parrett. (ACTION: EA, EN)

5.5.4

Pass information gathered during survey and monitoring of this species to a central database for incorporation into national and international databases. (ACTION: CCW, EA, EN)

5.6.1

Promote opportunities for the appreciation of the species and the conservation issues associated with its habitat. This should be achieved via articles within appropriate journals as well as by a publicity leaflet. (ACTION: EA, EN)

Appendix 11 - Shellfish Waters Directive; Current Monitoring Sites

Shellfish Waters Monitoring Sites

Region	Sample Sit	Site Name	Site Water Type	NGR
N West	27921			SJ18008700
N West	88003594	Ribble Estuary 10th Milepost		SD35002630
N West	88003935	Wyre Estuary Buoy 16		SD33604880
N West	88004079			SD42205440
N West	88004104			SD40505380
N West	88019977			SJ23009100
N West	88019978			SJ29009450
N West	88019979			SD44106500
N West	88019980			SD19906720
N West	88019981			SD24906700
N West	88019982			NY07805000
N West	88019983			NY15505750
N East	tempURN 001	Holy Island		NU12604150
Anglian	62M09S	Wash, Cork Hole tide gauge		TF60503190
Anglian	66M07	Wash, Old Hunstanton beach cliff path		TF67804250
Anglian	BE0630	Salcott Channel off Sunken Isle		TL99241232
Anglian	BE0770	Tollesbury N Channel off Gt Cob Isle		TL98901105
Anglian	BE11	Blackwater, SE of Tollesbury		TL98000820
Anglian	BE15	Goldhangar Creek		TL93350675
Anglian	BE600213	Strood Channel, opp slip		TM00011337
Anglian	BLA10	Blakeney Harbour, Simpool head buoy 9		TF99454545
Anglian	BLY064	Blyth d/s Wolsey sluice		TM46207680
Anglian	BRAN150	Brancaster - the Staithe, seawater		TF79304450
Anglian	CE09	Crouch, North Farnbridge		TQ85289640
Anglian	HW1520	Hamford Water, the Twizzle off Titchmars		TM24552346
Anglian	NE04	Colne off Batemans Tower		TM07421590

Anglian	NE0530	Pyfleet Channel, W of Pewit Island		TM04381656
Anglian	NE608211	Dengie, 0.5km S of Beach head buoy		TM08601170
Anglian	OAE029	Ore/Alde, Home Reach SW of Martello tower		TM46105470
Anglian	OAE050	Butley, oysterage (Ore/Alde estuary)		TM39604850
Anglian	RE03	Roach, Monkton Quay, Foulness		TQ98909342
Anglian	RE08	Roach, East End, Paglesham		TQ94809207
Anglian	RE600184	Maplin Sand, 2m W Blacktail spit buoy		TR00328432
Anglian	WASHSF W	Wash, shellfish water (W/W 19)8 NMMP2		TF43004040
Thames	PTTR002 5	Thames at Southend	E	TQ88858130
Thames	PTTR002 6	Thames at No. 2 Sea Reach	E	TQ96158070
Thames	PTTR002 7	Thames at North Ouze Buoy	E	TR05368190
Southern	E0001305			TR15106967
Southern	E0001436			TR37587339
Southern	E0017471			TR04216609
Southern	E0017472			TQ99076617
Southern	E0017473			TQ99847539
Southern	F0001801			SU81960131
Southern	F0001807			SU77550041
Southern	F0001821			SU74660061
Southern	G0003589	Stanswood Bay		SU48800080
Southern	G0003595	Lepe Middle Bank		SZ42809700
Southern	G0003598	Sowley Ground		SZ37809480
Southern	G0003619			SZ41599861
Southern	G0003626			SU61040299
Southern	G0003649			SU70620338
Southern	G0003661			SU42790937
Southern	G0003677			SU49060312
Southern	G0003681			SU48630057
Southern	G0003696			SZ35929399
Southern	G0003715			SU51810044
Southern	G0003721			SZ58669740
Southern	G0003751			SZ32809108
Southern	G0003765			SZ45179771
Southern	G0003995			SZ38859525

Southern	Y0004263	Yarmouth Road		SZ36209080
Southern	Y0004264	Newtown Bank		SZ41709240
Southern	Y0004367			SZ49949735
Southern	Y0004385			SZ50159439
Southern	Y0017474			SZ36709080
Southern	Y0017475			SZ43189325
Southern	Y0017476			SZ41769166
Southern	Y0017477			SZ63099447
Southern	Y004406			SZ31208692
S West	32103000	Poole Harbour Hutchins B		SY99508950
S West	32106000	Poole Harbour Salterns		SZ03508930
S West	32110000	Poole Harbour Entrance		SZ03708690
S West	32112000	Poole Harbour Ghorn Pnt		SZ01408680
S West	32115000	Portland Harbour SP1		SY67907500
S West	32116000	Portland Harbour SP2		SY69007630
S West	50024473	POOLE BAY SHELLFISH WATER	T	SZ09508900
S West	50034695	SHAMBLES BANK SHELLFISH WATER	T	SY70556680
S West	50040123	EAST FLEET AT THE NARROWS(MID CHANNEL)	T	SY65107720
S West	50044463	PORTLAND HARBOUR 2	T	SY69007630
S West	50044494	PORTLAND HARBOUR 1	T	SY67907500
S West	50900149	POOLE HARBOUR TWELVE (SOUTH DEEP)	T	SZ01408680
S West	50900387	POOLE HARBOUR 1 WAREHAM CHANNEL BUOY 82	T	SY96308930
S West	50950125	POOLE HARBOUR SIX (NEAR BUOY NO 36)	T	SZ03508930
S West	70510155	RIVER EXE AT COCKWOOD	T	SX98208080
S West	70610159	RIVER TEIGN AT LOWER ESTUARY	T	SX92507260

S West	70610183	TEIGN ESTUARY WEST SHELLFISH WATER	T	SX90307270
S West	70614940	BRIXHAM SHELLFISH WATERS	T	SX91305740
S West	70710338	RIVER DART AT LOWER GURROW POINT	T	SX87005590
S West	70811765	SALCOMBE SHELLFISH WATER	T	SX74704070
S West	70816060	BIGBURY AND AVON SHELLFISH WATER	T	SX67304470
S West	72910261	RIVER TORRIDGE BY NAPP HOUSE NORTHAM	T	SS46702930
S West	73010147	TAW-TORRIDGE ESTUARY MOUTH SHELLFISH W	T	SS46003150
S West	73010260	TAW SHELLFISH WATER	T	SS48003300
S West	81010140	RIVER YEALM AT WEMBURY HOUSE	T	SX54354925
S West	81211630	LYNHER SHELLFISH WATER	T	SX40855650
S West	81220164	TAMAR SHELLFISH WATERS	T	SX43806100
S West	81511010	PONT PILL U/S FOWEY CONFLUENCE	T	SX13805164
S West	81910102	Turnaware Bar		SW83403830
S West	81910137	CARRICK ROADS SHELLFISH WATER	T	SW83103400
S West	81910532	PERCUIL SHELLFISH WATER	T	SW85653330
S West	81910535	Percuil River		SW85803390
S West	81910640	PENRYN SHELLFISH WATER	T	SW80353400
S West	81913754	Helford Estuary		SW74602640
S West	81913757	HELFORD RIVER SHELLFISH WATER SITE	T	SW74602640

S West	81920177	RIVER FAL AT TOLVERNE	T	SW86004030
S West	81922205	TRURO RIVER AT OLD KEA	T	SW84834142
S West	81940113	TRESSILIAN SHELLFISH WATER SITE	T	SW85504330
S West	82518086	CAMEL SHELLFISH WATER	T	SW93907470
S West	n/a			
Wales	27620			SH49136552
Wales	27735			SH58307400
Wales	27909			SN63459490
Wales	27910			SH63501550
Wales	27911			SH56603728
Wales	27912			SH57003630
Wales	27913			SH45006090
Wales	27914			SH37656500
Wales	27915			SH40006150
Wales	27916			SH56008160
Wales	27917			SH74507925
Wales	27918			SH78708300
Wales	27919			SH84508175
Wales	27920			SH90507900
Wales	27922			SJ15508500
Wales	39660			SM97500490
Wales	72881			SS47209850
Wales	72882			SS48009730
Wales	73086			SN35500695
Wales	74093			SS70358804
Wales	74094			SS63008000
Wales	74118			SS64009000
Wales	74119			SS83007300
Wales	83621			SN33750900
Wales	83622			SN33750935
Wales	83623			SN02250575

Table 1 Temporal Trend Monitoring required in Sediments**Strategy**

This monitoring is completed to fulfil the requirements of the following JAMP issues:

JAMP Issue 1.2 What are the concentrations and fluxes of Mercury, Cadmium and Lead in sediment and biota?

JAMP Issue 1.7 Do high concentrations of PCBs pose a risk to the marine ecosystem?

JAMP Issue 1.10 What are the concentrations of PAHs in the maritime area?

JAMP Issue 1.17 Where do pollutants cause deleterious effects?

The following guidelines are relevant to this part of the programme:

JAMP Guidelines for Monitoring Contaminants in Sediments.

JAMP Eutrophication Monitoring Guidelines: Benthos.

JAMP Guidelines for General Biological Effects Monitoring.

This part of the programme also meets some of the requirements of the standstill clause of the EC Dangerous Substances Directive.

It is anticipated that the metals programme will at worst have 90% power to detect a 5% per year change over a period of between 15 and 20 years.

A current SNIFFER project is evaluating the power of the benthic infaunal measurements.

Five replicate sediment samples will be collected randomly within a specified radius of the sampling point (50m at offshore and intermediate sites and 20m at estuarine sites). A minimum of 15 samples will be collected randomly within each sampling circle: 5 replicates for chemistry; 5 for benthic analysis and at least 5 for biological effects (more material may be required). Samples will be collected between February and June. In order to minimise the effects of seasonal variability in the macrobenthic communities, sampling should be undertaken within a narrow time window within the broader window of February to June. It is recommended that sampling is undertaken +/- 3 weeks of the original sampling date in 1999 or 2000. If sampling is undertaken during May or June then +/- 2 weeks is recommended.

Samples for chemical analysis will be sieved to <63 μ . However, existing methodologies may also be maintained where a time series exists. Most samples should have a fine fraction since stable depositional sediments have been selected as ideal for temporal trend monitoring for NMMP2. Metals will be analysed using the HF total digest method.

Methodology

See Appendices 1, 2, 5, 6 & 7.

Table 1: Determinand		ICES Code	Units	NMCAQC target	
				Threshold	P%
METALS					
Aluminium		AL	%	0.1	25
Cadmium		CD	mg/kg	0.05	25
Mercury		HG	mg/kg	0.01	25
Copper		CU	mg/kg	1	25
Lead		PB	mg/kg	2	25
Nickel		NI	mg/kg	1	25
Zinc		ZN	mg/kg	2.5	25
Arsenic		AS	mg/kg	1	25
Chromium		CR	mg/kg	2	25

Table 1: Determinand	ICES Code	Units	NMCAQC target	
Lithium	LI	mg/kg	0.1	25
Iron	FE	%	0.1	25
Manganese	MN	mg/kg	0.1	25
ORGANICS				
PCB 28	CB28	µg/kg	0.1	25
PCB 52	CB52	µg/kg	0.1	25
PCB 101	CB101	µg/kg	0.1	25
PCB 118	CB118	µg/kg	0.1	25
PCB 138	CB138	µg/kg	0.1	25
PCB 153	CB153	µg/kg	0.1	25
PCB 180	CB180	µg/kg	0.1	25
Naphthalene	NAP	µg/kg	10	25
Phenanthrene	PA	µg/kg	10	25
Anthracene	ANT	µg/kg	10	25
Fluoranthene	FLU	µg/kg	2	25
Pyrene	PYR	µg/kg	2	25
Benzo[a]anthracene	BAA	µg/kg	2	25
Chrysene	CHRTR	µg/kg	2	25
Benzo[a]pyrene	BAP	µg/kg	2	25
Benzo[ghi]perylene	BGHP	µg/kg	10	25
Indeno[123-cd]pyrene	ICDP	µg/kg	10	25
BIOLOGICAL EFFECTS				
Corophium mortality (10 day)		%		
Arenicola mortality and feeding rate (10 day)		%		
Tisbe mortality pore water (2 day)		%		
benthic macrofauna	MCS/NODC Codes			
SUPPORTING DETERMINANDS				
Redox				
Temperature				
Ammonia	AMON			
Sulphide				
Organic carbon	CORG	%	0.1	25
Particle size analysis				
Sieve size used		µ		
Coal quantification				

Where toxic effects are observed, toxicity-directed analysis of interstitial water fractions should be carried out.

Biological Effects - Sediments

Benthic Macrofauna, Corophium, Arenicola, Tisbe.

As the methodology develops, participating organisations will in future apply whole sediment or pore water bioassays at estuarine sites. Associated chemical analysis of sediments will likely require its own specific methodology.

Special Surveys

Dioxins and Furans

The Environment Agency may carry out a research and development survey to measure dioxins and furans in sediments.

CEFAS plan a special survey of nonyl phenols in sediments.

Table 2 - Monitoring required in Shellfish**Strategy**

This monitoring is completed to fulfil the requirements of the following JAMP Issues:

- | | |
|-----------------|---|
| JAMP Issue 1.2 | What are the concentrations and fluxes of Mercury, Cadmium and Lead in sediment and biota? |
| JAMP Issue 1.3 | To what extent do biological effects occur in the vicinity of major shipping routes, offshore installations, marinas and shipyards? |
| JAMP Issue 1.7 | Do high concentrations of PCBs pose a risk to the marine ecosystem? |
| JAMP Issue 1.10 | What are the concentrations of PAHs in the maritime area? |
| JAMP Issue 1.11 | Do PAHs affect fish and shellfish? |
| JAMP Issue 1.17 | Where do pollutants cause deleterious effects? |

The following guidelines are relevant to this part of the Programme:

JAMP Guidelines for Monitoring Contaminants in Biota.

JAMP Guidelines for Contaminant Specific Biological Effects Monitoring.

This part of the programme also meets some of the requirements of the standstill clause of the EC Dangerous Substances Directive.

To minimise duplication of effort, Shellfish Growing Waters or Shellfish Hygiene Directive sites should be used for NMMP2 purposes where possible. It is anticipated that this programme will have 90% power to detect at least a 10% per year change in metal concentrations and a 20% per year change in organics concentrations over a 20 year period.

The common blue mussel (*Mytilus edulis*) should be used. Where this species is not available the brown seaweed (*Fucus vesiculosus* or *Fucus spiralis*) may be used. The same species should be used henceforth for temporal trend monitoring and should be collected at the same time of year on all sampling occasions. Methodologies are given in Appendix 4.

Samples should be collected from the shore at locations adjacent to subtidal NMMP2 sites. Samples should be collected between February / March to avoid the spawning period. Three pools of at least 20 individual mussels in the size range 3-6 cm should be collected with enough soft tissue for each analyses. To minimise the effects of natural size related variability, the length range of individuals within this broad band should be minimised as much as possible to, for example, 5 mm. This narrower length band should then be fixed from year to year. In selecting the sample, care should be taken that it is representative of the population and that it can be obtained annually. Average data from the 3 pools should be reported with supporting data on species used, mean length, % moisture and % lipid (on wet weight basis).

Methodology

See Appendix 4.

Table 2: Determinand	ICES Code	Units	NMCAQC target	
			Threshold	P%
METALS				
Mercury	HG	µg/kg wet weight	200 (mussels) 3 (<i>Fucus</i> only)	25
Cadmium	CD	µg/kg wet weight	100	25
Copper	CU	µg/kg wet weight	100	25
Lead	PB	µg/kg wet weight	50	25
Nickel	NI	µg/kg wet weight	100	25
Zinc	ZN	µg/kg wet weight	2000	25
Arsenic	AS	µg/kg wet weight	300	25
Chromium	CR	µg/kg wet weight	100	25
Silver	AG	µg/kg wet weight	50 (no target for <i>Fucus</i> sp.)	25
Selenium	SE	µg/kg wet weight	10 (no target for <i>Fucus</i> sp.)	25
ORGANICS				
PCB 28	CB28	µg/kg wet weight	0.1	25
PCB 52	CB52	µg/kg wet weight	0.1	25
PCB 101	CB101	µg/kg wet weight	0.1	25
PCB 118	CB118	µg/kg wet weight	0.1	25
PCB 138	CB138	µg/kg wet weight	0.1	25
PCB 153	CB153	µg/kg wet weight	0.1	25
PCB 180	CB180	µg/kg wet weight	0.1	25
HCH - alpha	HCHA	µg/kg wet weight	0.1	25
HCH B beta	HCHB	µg/kg wet weight	0.1	25
HCH - gamma	HCHG	µg/kg wet weight	0.1	25
HCH - delta	HCHD	µg/kg wet weight	0.1	25
op-DDT	DDTOP	µg/kg wet weight	0.1	25
pp-DDT	DDTPP	µg/kg wet weight	0.1	25
pp-TDE	TDEPP	µg/kg wet weight	0.1	25
pp-DDE	DDEPP	µg/kg wet weight	0.1	25
Dieldrin	DIELD	µg/kg wet weight	0.1	25
Aldrin	ALD	µg/kg wet weight	0.1	25
Endrin	END	µg/kg wet weight	0.1	25
Isodrin	ISOD	µg/kg wet weight	0.1	25
HCB	HCB	µg/kg wet weight	0.1	25
HCBd	HCBd	µg/kg wet weight	0.1	25
Naphthalene	NAP	µg/kg wet weight	0.5	25
Phenanthrene	PA	µg/kg wet weight	0.5	25
Anthracene	ANT	µg/kg wet weight	0.5	25
Fluoranthene	FLU	µg/kg wet weight	0.5	25
Pyrene	PYR	µg/kg wet weight	0.5	25
Benzo[a]anthracene	BAA	µg/kg wet weight	0.5	25
Chrysene	CHRTR	µg/kg wet weight	0.5	25
Benzo[a]pyrene	BAP	µg/kg wet weight	0.5	25
Benzo[ghi]perylene	BGHIP	µg/kg wet weight	0.5	25
Indeno[123-cd]pyrene	ICDP	µg/kg wet weight	0.5	25
SUPPORTING DETERMINANDS				
Total lipid		% wet weight	0.1	25
Moisture content	MOCON	% wet weight		
Tributyl tin (for imposex only)	TBTIN	µg/kg wet weight	20	25
Mean pool length		cm		
No. of shellfish per batch				
Species identity				

Biological Effects - Shellfish**Imposex/intersex and TBT Methodology**

Appendices 7 & 8 deal with the methodology.

SERAD has carried out a survey of imposex in dogwhelks *Nucella lapillus* on the West Coast of Britain and Northern Ireland in 1997. This work was funded by DETR. A further DETR-funded study of the East Coast of Britain will be carried out in 1999. These data will be collated and any gaps will be identified. Temporal trend monitoring will continue at selected sites.

In areas where dogwhelks are not present in sufficient numbers, common periwinkles (*Littorina littorea*) may be used as a substitute but in these cases the degree of intersex, not imposex, must be measured. Imposex and intersex data should be supported by analysis of TBT in tissue. CEFAS will survey imposex in whelks (*Buccinum undatum*) offshore.

Developmental work will be continued on the use of Scope for Growth measurements.

Special Surveys

CEFAS plan to carry out a limited survey for nitro-PAHs in mussels.

Samples of shellfish are collected regularly from areas designated as Shellfish Production Areas and analysed for bacterial content by FRS. On the basis of these results, the Areas are categorised according to their suitability for shellfish production and the degree of treatment (depuration) required before the shellfish may be placed on the market. The results for Scotland are made available in annual reports.

Samples of wild and farmed shellfish from Scottish waters are regularly collected and examined for the presence of algal toxins (PSP, DSP, ASP) by FRS. Phytoplankton population from selected sites are also monitored for the presence of potentially toxic species. The results of these surveys are reported in annual reports.

Table 3 - Monitoring required in fish**Strategy**

This monitoring is undertaken to fulfill the requirements of the following JAMP Issues.

- JAMP Issue 1.2 What are the concentrations and fluxes of Mercury, Cadmium and Lead in sediment and biota?
- JAMP Issue 1.3 To what extent to biological effects occur in the vicinity of major shipping routes, offshore installations, marinas and shipyards?
- JAMP Issue 1.7 Do high concentrations of PCBs pose a risk to the marine ecosystem?
- JAMP Issue 1.8 Do high concentrations of non-ortho and mono-ortho CBs in seafood pose a risk to human health?
- JAMP Issue 1.10 What are the concentrations of PAHs in the maritime area?
- JAMP Issue 1.11 Do PAHs affect fish and shellfish?
- JAMP Issue 1.17 Where do pollutants cause deleterious effects?

The following guidelines are relevant to this part of the Programme:

JAMP Guidelines for Monitoring Contaminants in Biota.

JAMP Guidelines for Contaminant Specific Biological Effects Monitoring.

This part of the programme also meets some of the requirements of the EC Fishery Products Directive.

It is anticipated that this programme will have 90% power to detect a 2-10% per year change in metal concentrations in fish muscle over a 20 year period. It is anticipated that the programme for monitoring contaminants in fish liver will have 90% power to detect a 3-10% change per year in both metals and organics over a 20 year period.

Preferred species are dab (*Limanda limanda*) or flounder (*Platichthys flesus*). Other acceptable species include plaice, cod and whiting. Whichever species is chosen it must be analysed throughout the time series dataset, in a consistent strategy, outside the breeding season.

Ideally, about 25 (22 to 28) fish in the size range 18-30 cm (dab), 15-35 cm (flounder), 20-30cm (plaice), 30-45cm (cod) and 20-35cm (whiting) should be collected at a site. Length stratified data are needed from 5 batches of at least 5 fish. If five fish yield insufficient liver tissue for analysis more than five fish may be collected from one or more catches of the 5 fixed length strata. A minimum of 4 batches are required from the 5 fixed length strata. The number of fish pooled in each batch must be the same each year. Visibly damaged fish should not be included. Each batch should correspond to one of the 5 fixed length strata. Data should be reported with supporting data on mean length, % lipid and % wet weight. Analyses should be carried out on both the muscle and the liver. Samples should be collected outside the spawning period and at the same time of the year in each year.

Where there is an insufficient range of fish at a site eg < 10 cm, the sampling strategy may be revised as follows:

Modification 1 Length range 5-10 cm with the fixed length range

Split the length range close to the log mid-point into small and large. Collect a minimum of twenty fish to provide 2 equal replicates of each size group with a minimum of five fish per replicate. Fish should be allocated to replicates before homogenising the tissue.

Modification 2 length range < 5 cm

Collect a random sample of a minimum of twenty fish and randomly allocate them equally to 4 replicates of at least five fish. Again fish should be allocated to replicates before homogenising the tissue.

An alternative to length stratified sampling may be to minimise natural variability. At least 12 single sex fish, preferably female, age 2-3 years should be caught in a narrow length range (i.e. 26-30cm, 31-35cm etc). The length of the individuals collected should be constant from year to year at each station or should at least fall within a very narrow range, such as within 5cm. In selecting the sample, care should be taken that it is representative of the population and that it can be obtained annually.

Methodology

Appendices 3, 7 & 8 deal with the methodology.

Table 3: Determinand	ICES Code	Matrix	Units	NMCAQC target	
				Threshold	P%
METALS in MUSCLE					
Mercury	HG	Muscle	µg/kg wet weight	20	25
Arsenic	AS	Muscle	µg/kg wet weight	300	25
METALS in LIVER					
Cadmium	CD	Liver	µg/kg wet weight	25	25
Lead	PB	Liver	µg/kg wet weight	10	25
ORGANICS in LIVER					
PCB 28	CB28	Liver	µg/kg wet weight	0.1	25
PCB 52	CB52	Liver	µg/kg wet weight	0.1	25
PCB 101	CB101	Liver	µg/kg wet weight	0.1	25
PCB 118	CB118	Liver	µg/kg wet weight	0.1	25
PCB 138	CB138	Liver	µg/kg wet weight	0.1	25
PCB 153	CB153	Liver	µg/kg wet weight	0.1	25
PCB 180	CB180	Liver	µg/kg wet weight	0.1	25
SUPPORTING DETERMINANDS					
Moisture content	MOCON	Tissue	% wet weight		
Total lipid		Tissue	% wet weight		
Length (mean)		Fish	mm		
Species identity		Fish			
Sex		Fish	M/F		
Liver weight		Liver	g		

The analysis of arsenic in fish flesh is only required where data is to be reported for the Fisheries Product Directive.

Biological Effects - Fish EROD/PAH

A special survey of EROD induction in flatfish will be carried out by the fisheries laboratories (CEFAS and FRS). The flatfish in estuaries will be flounder, and those offshore will be either plaice or dab.

These data may be augmented by the analyses of PAH metabolites in bile and PCBs in liver. Laboratories will liaise over sampling.

FRS will survey stations in the West of Scotland for temporal trends in the biological effects in fish: Colonsay, Pladda, Garroch Head, Hunterston and a control in the Minch (Broad Bay). The stations where CEFAS will undertake such monitoring are indicated in Table 6.

Fish Disease

CEFAS will undertake surveys of fish disease in flatfish once per annum as indicated in Table 6 and Appendix 7. Target species will be dab and flounder, although commercial species will be examined where sufficient numbers are caught. Protocol for examination of external disease and gross liver pathology will be according to ICES (1996). Samples will also be taken for the assessment of liver pathology using guidelines according to ICES (1997).

Surveys of fish disease involve FRS work in May-June at St Abbs, Bell Rock, the Beatrice Field and the JONSIS line. The ICES (1997) protocol for dabs will apply.

Other Biomarkers

CEFAS will undertake development work on biomarkers: DNA adducts; metallothionein induction etc.

Special Surveys

Flame Retardants/Toxaphene

CEFAS plan to carry out a special survey of polybrominated diphenyl ethers and toxaphene in fish liver.

An extensive research project on endocrine disruptors in the marine environment (EDMAR) is currently being funded by DETR. The project manager is CEFAS.

Table 4 - Monitoring of Nutrients in Water**Strategy**

Nutrients and related determinands are measured to meet some of the requirements of the OSPAR Nutrient Monitoring Programme.

The OSPAR Strategy to Combat Eutrophication requires that "Areas of the maritime area, for which actions are needed, will be identified by the Common Procedure for the Identification of the Eutrophic Status of the Maritime Area (the "Common Procedure") which will be used to characterise each part of the maritime area as a problem area or a potential problem area or a non-problem area with regard to eutrophication. In implementing the Common Procedure, the Commission will:

- a. develop and adopt common assessment criteria;
- b. assess the results of its application by Contracting Parties.

The identification of the eutrophication status of their parts of the maritime area will be made by Contracting Parties."

In June 2000, a number of non-problem areas with regard to eutrophication were identified and agreed by the OSPAR Commission through the screening procedure contained in the Common Procedure. By 2002, the eutrophication status of all parts of the maritime area will be identified through the Common Procedure. Following this, it aims to have achieved, by the year 2010, a healthy marine environment where eutrophication does not occur.

The following areas of UK marine waters will be subject to the Comprehensive Procedure:

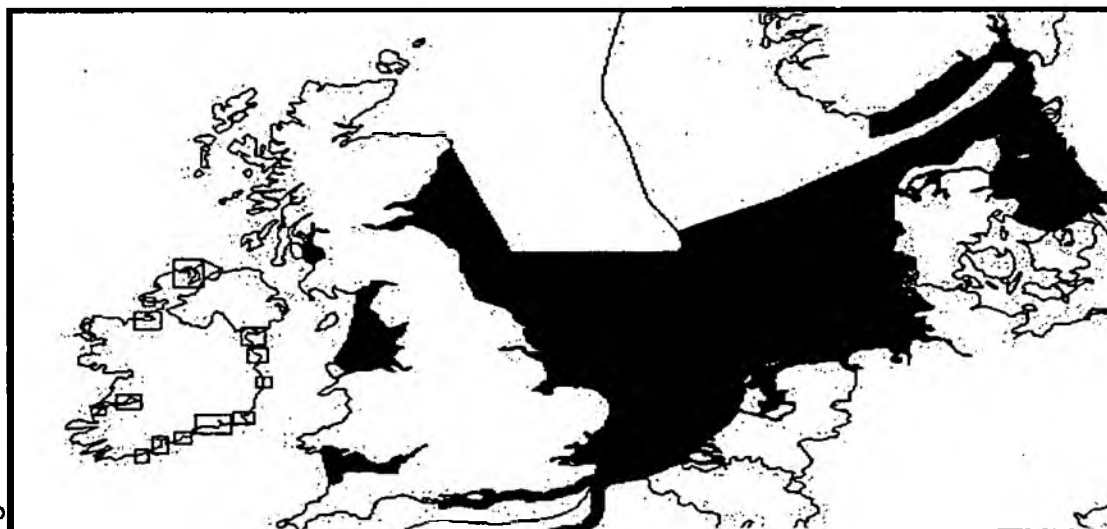
1. the North Sea - off the UK east coast, from Peterhead southwards;
2. the Channel - off the UK south coast, from Poole Bay eastwards;
3. the mouth of the Severn upstream of a line from Bideford Bay to Carmarthen Bay;
4. the Irish Sea/Liverpool Bay region from Anglesey to Solway Firth; and
5. the Firth of Clyde.

All other UK marine waters are non-problem areas although it is recognised that there may be local problem areas within these broad areas.

Areas subject to the Comprehensive Procedure - part North Sea and adjacent waters.

■ Areas subject to the Comprehensive Procedure (areas in Ireland are indicated in frames)

— Sector boundary (after North Sea Quality Status Report 1993)



mo
requirements are summarised below.

Table 4.1

	Non-problem Areas ¹	Potential Problem Areas	Problem Areas
NH ₄ -N	+	+	+
NO ₂ -N	+ ²	+	+
NO ₃ -N	+ ²	+	+
PO ₄ -P	+	+	+
SiO ₄ -Si	-	+	+
Salinity	+	+	+
Temperature	+	+	+
Frequency ³	About every three years during winter ⁴	Annually during winter and during direct and indirect effects monitoring	

Where possible, axial transects of nutrient concentration in estuaries should be completed. It is recognised that spot water samples for inherently variable determinands such as nitrate, dissolved oxygen and chlorophyll *a* are of limited value in long term trend monitoring and that continuous data sets are preferable. Ideally areas of concern should be monitored using continuous recording buoys where appropriate. This technology is still in the developmental stage and steps should be taken to ensure that all organisations share experience to lead to best practice.

Additional monitoring of direct and indirect eutrophication effects is required at potential problem and problem areas as shown below:

Direct and Indirect Eutrophication Effects

	Non-problem areas ¹	Potential Problem Areas	Problem Areas
Phytoplankton chlorophyll	-	+	+
Phytoplankton species composition	-	<ul style="list-style-type: none"> composition: (genera and nuisance/potentially toxic species) 	<ul style="list-style-type: none"> composition: (genera and nuisance/ potentially toxic species)
Macrophytes (in shallow areas, primarily in estuaries and coastal waters)	-	<ul style="list-style-type: none"> biomass 	<ul style="list-style-type: none"> TOC and POC biomass species composition and reduced depth distribution
O ₂ (including % saturation)	-	+	+
Benthic communities	-	<ul style="list-style-type: none"> biomass and species composition (if time series already exist) 	<ul style="list-style-type: none"> biomass and species composition
Frequency	-	Annually at times of maximum growth/activity	

Ecological quality objectives for defining trophic status have not yet been agreed.

See Appendix 6 for Procedural Guidelines.

Table 5 - Compliance Monitoring of Contaminants in Water

Strategy

1 Where obvious non problem areas exist it should be left to the discretion of the Contracting Parties to determine the frequency and range of any analyses which they consider desirable and to report as necessary.

2 For non-problem areas with regard to eutrophication the sum of NO₂ and NO₃ can be reported.

3 Each monitoring event should include sufficient samples to confirm that the maximum winter nutrient concentration has been determined. Winter is defined as the period with the lowest algal activity and maximum remineralisation.

4 Reporting should be based on the results of monitoring and/or research programmes and/or current literature.

Monitoring for trace metals and organic compounds is undertaken to comply with the requirements of the EC Dangerous Substances Directive and is therefore only completed at National Network background monitoring points. Analyses should be carried out seasonally, 4 times per year. Organisations need only submit data collected for their statutory monitoring requirements: List I substances, and List II substances where there is a known source. All samples from the water column are to be taken about 1 metre below the surface. Water samples should be recovered at such a tidal state as gives worst case contaminant concentration or is otherwise practicable. Every effort should be made thereafter to recover samples under similar tidal conditions at each site.

Methodology

See Appendix 6 for Procedural Guidelines.

Metals

Table 5: Determinands		Units	ICES	NMCAQC Target	
DISSOLVED	METALS			Threshold	P%
LIST I					
Mercury		ng/l	HG	3	25
Cadmium		µg/l	CD	0.04	25
LIST II					
Copper		µg/l	CU	0.2	25
Lead		µg/l	PB	0.04	25
Nickel		µg/l	NI	0.25	25
Zinc		µg/l	ZN	0.4	25
Iron		µg/l	FE	100	25
Boron		µg/l	B	700	25
Arsenic		µg/l	AS	2.5	25
Chromium		µg/l	CR	1.5	25
Vanadium		µg/l	V	10	25
SUPPORTING DETERMINANDS					
Salinity			PSAL	0.5	
Suspended solids		mg/l	SUSP	2	

Organics

Organics are to be monitored for DSD purposes only. The analysis should be of unfiltered samples. Data must be submitted with supporting salinity and suspended solids data.

Table 5: Determinand		Units	ICES Code	NMCAQC Target	
ORGANICS				Threshold	P%
LIST I					
HCH - alpha		ng/l	HCHA	2	25
HCH - beta		ng/l		2	25
HCH - gamma		ng/l		2	25
HCH - delta		ng/l		2	25
op-DDT		ng/l	DDTOP	1	25
pp-DDT		ng/l	DDTPP	1	25
pp-TDE		ng/l	TDEPP	1	25
pp-DDE		ng/l	DDEPP	1	25
DIELDRIN		ng/l	DIELD	1	25
ALDRIN		ng/l	ALD	1	25
ENDRIN		ng/l	END	0.5	25
ISODRIN		ng/l	ISOD	0.5	25
HCB		ng/l	HCB	3.0	25
HCBd		ng/l	HCBd	10	25
Carbon tetrachloride		µg/l	CCL4	0.1	25
Chloroform		µg/l	CHCL3	0.1	25
1,2 dichloroethane		µg/l	DCE	1	25
1,2,4 trichlorobenzene		ng/l	TRCB	10	25
1,3,5 trichlorobenzene		ng/l		10	25
1,2,3 trichlorobenzene		ng/l		10	25

Table 5: Determinand	Units	ICES Code	NMCAQC Target	
Perchloroethylene	µg/l		0.1	25
Trichloroethylene	µg/l		0.1	25
Pentachlorophenol	µg/l		0.2	25
LIST II				
2,4 - D (total ester)	µg/l		0.1	25
2,4 - D (non ester)	µg/l		4.0	25
1,1,1 - trichloroethane	µg/l	TCE	10	25
1,1,2 - trichloroethane	µg/l		30	25
Bentazone	µg/l		50	25
Biphenyl	µg/l		2.5	25
4-chloro-2-nitrotoluene	µg/l		0.2	25
4-chloro-3-nitrotoluene	µg/l		0.2	25
2-chloro-4-nitrotoluene	µg/l		0.2	25
2-chloro-5-nitrotoluene	µg/l		0.2	25
2-chloro-6-nitrotoluene	µg/l		0.2	25
Demeton				
Demeton - o				
Demeton - s				
Oxydemeton - methyl	ng/l		10	25
Demeton - s - methyl	ng/l		10	25
Demeton - s - methyl sulphone	ng/l		10	25
Dimethoate	µg/l		0.1	25
Linuron	µg/l		2.0	25
MCPA	µg/l		0.2	25
Mecoprop	µg/l		2.0	25
Toluene	µg/l	TOL	4	25
Triazaphos	ng/l		0.5	25
Dichlorvos	ng/l	DCV	4	25
Atrazine	ng/l	ATRZ	100	25
Simazine	ng/l	SIMZ	100	25
Azinphos - methyl	ng/l	AZM	1.0	25
Endosulphan (total)	ng/l	ENDTOT	0.3	25
Fenitrothion	ng/l	FENT	1.0	25
Malathion	ng/l		2.0	25
Trifluralin	ng/l	TRF	10	25
Triphenyltin	ng/l	TPT	0.2	25
Tributyltin	ng/l	TBTIN	0.8	25
Benzene	µg/l	BENZ	1	25
O - xylene	µg/l	XYLO	1	25
M - xylene	µg/l	XYLM	1	25
P - xylene	µg/l	XYLP	1	25
Diazinon	ng/l		1	25
Chlorfenvinphos	ng/l		1	25
Propetamphos	ng/l		1	25
Naphthalene	µg/l	NAP	0.5	25
4-chloro-3-methyl phenol	µg/l		4	25
2-chlorophenol	µg/l		5	25
2,4-dichlorophenol	µg/l		2	25
PCSDs	ng/l		5	25
Cyfluthrin	ng/l		0.1	25
Sulcofuron	µg/l		2.5	25
Flucofuron	µg/l		0.1	25
Permethrin	ng/l		1	25

Biological Effects - Water

This part of the programme complements the monitoring of contaminants in water, sediment and shellfish, and is planned to increase in future to meet the requirements of the OSPAR JAMP. New techniques are to be developed and screened under the auspices of the Ecotoxicology Quality Control Scheme.

Methodology

Appendices 7 & 8 deal with the methodology.

Oyster bioassay (*Crassostrea gigas*)

Determinand	comments
Embryo abnormality (24 hour)	Unfiltered water samples should always be collected sub-surface at the same stage of tide. The stage should be chosen as worst case (usually as near low water as practically possible). See Appendices.

Where toxic effects are observed, toxicity-directed analysis of water fractions should ideally be carried out.

Table 6 - Site Locations and Monitoring Authorities

In this table, the type of each station is classified: E Estuarine; I Intermediate; O Offshore. The main activities are represented:

W : Water* / Oyster Embryo Bioassay

S : Sediments and Benthos / Sediment Bioassays

Sh : Shellfish (or macroalgae)

F : Fish (For CEFAS this includes fish disease and biomarker studies)

For example : O/WF is an offshore site sampled for water and fish

*CEFAS is only analysing nutrients in water samples, together with biological effects studies using solid phase extraction.

MPMMG UK NATIONAL MARINE MONITORING PROGRAMME: SAMPLING STATIONS

Code	Estuary/ Location	Site	Type	Agency	National Grid Ref.	Latitude	Longitude
Solway							
25	Offshore Solway	(moved 1998)	I/WSF	FRS	NX 713 413	54 45.00 N	04 00.00 W
Clyde							
35	Firth of Clyde	(moved 98)	O/WShF	FRS	NS 045 087	55 20.00 N	05 05.00 W
45	Inner Firth of Clyde	CMT5 - N. of Cumbrae	I/WSSh	SEPA	NS 134 627	55 49.30 N	04 58.70 W
55	Clyde	CMT7 - off Cloch Pt.	I/WSSh	SEPA	NS 193 765	55 56.85 N	04 53.65 W
65	Clyde	Port Glasgow	E/WFSH	SEPA	NS 330 747	55 56.28 N	04 40.46 W
70	Clyde	Stn.H, Irvine Bay	I/WSFSh	SEPA	NS 242 374	55 35.92 N	04 47.40 W
76	West Coast	Loch Linnhe	I/WSSh	SEPA	NM 868 485	56 34.80 N	05 28.30 W
Highland							
85	Minches	Minches	I/WSF	FRS	NB 834 070	58 00.00 N	05 40.00 W
95	Moray Firth	Intermediate	I/WS	FRS	NH 916 655	57 40.00 N	03 49.00 W
105	Moray Firth	Offshore	O/WSF	FRS	ND 410 072	58 03.00 N	03 00.00 W
Tay							
115	Tay	Broughty Castle	E/W	SEPA	NO 449 303	56 27.70 N	02 53.07 W
125	Tay	Tayport	E/ShF	SEPA	NO 469 290	56 27.05 N	02 51.71 W
Forth							
165	Tay/Forth	Forth/Tay Offshore	O/WSF	FRS		56 30.00 N	01 30.00 W
175	Forth	Kingston Hudds	I/WSF	SEPA	NT 315 847	56 03.00 N	03 06.00 W
200	Forth	Ferry Ness	I/Sh	SEPA	NT 439 776	55 59.29 N	02 53.96 W
205	Forth	Hen and Chickens	E S	SEPA	NS 973 845	56 02.55 N	03 38.92 W
206	Forth	Blackness	E/W	SEPA	NT 062 824	56 01.52 N	03 30.32 W
207	Forth	Blackness	E/FSH	SEPA	NT 059 801	56 00.28 N	03 30.55 W
North East							
210	Tweed	Yarrow Slake	E/SFSh	EA	NT 985 530	55 46.21 N	02 01.42 W
220	Northumber- land Coast	Northumberland SAC, Budle Bay	I/SFSh	EA	NU 147 353	55 36.66 N	01 46.00 W
225	Tyne	Hebburn	E/WSFSh	EA	NZ 304 657	54 59.09 N	01 31.49 W
235	Tyne	Ferry Crossing	E/SFSh	EA	NZ 361 683	55 00.47 N	01 25.84 W
244	Amble		I/F	CEFAS	NU 473 054	55 17.80 N	01 15.30 W
245	Off Tyne	NSTF14	I/WSF	CEFAS	NZ 554 685	55 00.50 N	01 08.00 W
265	Wear	Alexandra Bridge	E/SFSh	EA	NZ 382 578	54 54.80 N	01 24.24 W
270	Durham Coast	Off Seaham	E/SFSh	EA	NZ 465 470	54 48.94 N	01 16.58 W
275	Wear	Sandy Point	E/WSFSh	EA	NZ 409 581	54 55.05 N	01 21.43 W
285	Off Tyne/Tees	NSTF43	O/WS(not benthos)	CEFAS	OW 141 538	54 50.00 N	01 20.00 E
286	West Dogger		O/F	CEFAS	OW 090 536	54 50.00 N	01 15.30 E
295	Off Tees	NSTF15	I/W	CEFAS	NZ 719 382	54 44.00 N	00 53.00 W

Code	Estuary/ Location	Site	Type	Agency	National Grid Ref.	Latitude	Longitude
305	Tees	Bamletts Bight	E/SFSH	EA	NZ 485 221	54 32.22 N	01 20.05 W
315	Tees	No 23 Buoy	E/SFSH	EA	NZ 530 225	54 33.52 N	01 18.33 W
325	Tees	Phillips Buoy	E/WSFSH	EA	NZ 541 264	54 38.95 N	01 09.49 W
330	Flamborough Coast	Flamborough Head SAC	I/Sh	EA	TA 255 708	54 07.05 N	00 04.78 W
344	Off Flam- borough		O/F	CEFAS	TA 621 858	54 14.50 N	00 29.30 E
345	Off Humber Wash	NSTF53	O/WS	CEFAS	TB 619 671	54 00.00 N	02 00.00 E
346	Off Humber		O/F	CEFAS	TB 480 697	54 03.80 N	01 47.40 E
Anglian							
356	Humber	Inside Spurn Head	EWS	EA	TA 379 125	53 35.44 N	00 05.09 E
357	Humber	Grimsby Roads	E/SFSH	EA	TA 296 117	53 35.16 N	00 02.50 W
358	Humber	Sunk Island, measured mile	E/S	EA	TA 254 161	53 37.57 N	00 06.13 W
375	Humber	NSTF16 (JONUS OSP2)	I/W	CEFAS	TA 546 066	53 32.00 N	00 20.00 E
376	not in 98/99		I/S	CEFAS	TF 720 850	53 20.00 N	00 35.00 E
377	Outer Humber		I/F	CEFAS	TF 617 828	53 19.00 N	00 25.70 E
385	Wash	NSTF17 (JONUS OSP6)	I/W	CEFAS	TF 658 541	53 03.50 N	00 28.50 E
386	not in 98/99		I/S	CEFAS	TF 567 454	52 58.98 N	00 20.08 E
387	Inner Wash		I/F	CEFAS	TF 709 636	53 08.50 N	00 33.30 E
388	Wash	off Boston (WW19)	I/SFSH	EA	TF 430 404	52 56.50 N	00 07.72 E
389	Wash	Cork Hole	I/SFSH	EA	TF 610 335	52 53.01 N	00 23.63 E
390	Blackwater		E/SSH	EA	TF 069 112	51 45.61 N	00 59.93 E
Thames							
395	Southern Bight	Smiths Knoll NSTF18	O/W	CEFAS	TH 255 372	52 50.00 N	02 50.00 E
435	Thames	Woolwich	E/SFSH	EA	TQ 433 796	51 29.27 N	00 03.87 E
455	Thames	Mucking	E/WSFSH	EA	TQ 718 802	51 29.67 N	00 28.46 E
465	Thames	Warp NSTF19	I/W	CEFAS	TR 058 836	51 30.80 N	00 58.00 E
466	not in 98/99		I/S	CEFAS		51 29.80 N	01 00.00 E
475	Thames	Gabbard	O/WS (not benthos)	CEFAS	TM 974 424	52 00.00 N	02 20.00 E
Southern							
485	South Vame	NSTF69	O/W	CEFAS	TR 304 201	50 56.00 N	01 16.80 E
486	Rye Bay		I/F	CEFAS	TQ 976 113	50 52.00 N	00 48.50 E
495	Selsey Bill	NSTF70	I/W	CEFAS	SZ 829 872	50 40.70 N	00 49.60 W
505	Soton water	Dock Head	E/SFSH	EA	SU 430 095	50 52.95 N	01 23.30 W
515	Soton water	E. Brambles Buoy	E/WSFSH	EA	SZ 544 989	50 47.70 N	01 13.55 W
526	Medway	Burham	E/SFSH	EA	TQ 712 624	51 20.02 N	00 28.56 E
527	Medway	Sun Pier	E/WSFSH	EA	TQ 755 683	51 23.13 N	00 31.29 E
South West							
535	Central Channel	NSTF72	O/W	CEFAS	SY 285 209	50 05.00 N	03 03.29 W
536	Lyme Bay		O/S	CEFAS	SY 203 595	50 25.80 N	03 07.30 W
537	Lyme Bay		O/F	CEFAS	SY 135 704	50 31.60 N	03 13.20 W
555	Tamar	Warren Point	E/SFSH	EA	SX 441 606	50 25.35 N	04 11.95 W
565	Tamar	Hamoaze	E/WSFSH	EA	SX 439 561	50 23.02 N	04 11.78 W
566	Poole Harbour	Upper South Deep	I/WSSH	EA	SY 999 874	50 41.15 N	01 59.32 W
567	Poole Harbour	Wyth	I/SSH	EA	SY 980 873	50 41.09 N	02 01.70 W
576	Off Tamar	Jennycliffe Bay	I/SFSH	EA	SX 485 521	50 20.92 N	04 07.74 W
585	Off Plymouth Sound	NSTF73	O/W	??EA/CE FAS	SX 305 176	50 02.00 N	04 22.00 W
595	Western Approaches Reference Station*		O/W	CEFAS	WK 569 618	48 30.00 N	08 00.00 W
605	Celtic Deep		O/WS	CEFAS	SR 209 578	51 15.00 N	06 00.00 W
615	Severn	Nash Point	I/W	CEFAS	SS 920 568	51 18.00 N	03 33.00 W

Code	Estuary/ Location	Site	Type	Agency	National Grid Ref.	Latitude	Longitude
Wales							
625	Severn	Purton	E/SFSH	EA	SO 673 034	51 43.66 N	02 28.45 W
635	Severn	Bedwin	E/SFSH	EA	ST 467 849	51 33.60 N	02 46.14 W
645	Severn	Peterstone	E/WSFSH	EA	ST 290 751	51 28.20 N	03 01.35 W
690	Dee	Mostyn Bank	E/SFSH	EA	SI 148 830	53 20.20 N	03 16.78 W
646	Milford Haven	Coshaston Point	E/SFSH	EA	SM 984 044	51 42.08 N	04 55.09 W
647	Dovey	Ynys-hir	E/SFSH	EA	SN 667 964	52 32.92 N	03 57.96 W
648	Mawddach	Bontddu	E/SFSH	EA	SH 657 171	52 44.06 N	03 59.32 W
655	Cardigan Bay		I/WS	CEFAS	SN 519 756	52 21.50 N	04 10.50 W
656	Inner Cardigan Bay		I/F	CEFAS	SN 429 670	52 16.70 N	04 18.20 W
665	Off Cardigan Bay		O/W	CEFAS	SM 964 934	52 30.00 N	05 00.00 W
North West							
705	Liverpool Bay	Burbo Bight	I/W	CEFAS	SI 164 980	53 28.29 N	03 15.58 W
706	Inner Liverpool Bay		I/F	CEFAS	SI 100 981	53 28.30 N	03 21.40 W
715	Liverpool Bay		O/WS (not benthos)	CEFAS	SC 878 017	53 30.00 N	03 41.50 W
755	Mersey	Seacombe Ferry	E/SFSH	EA	SI 330 908	53 24.56 N	03 00.48 W
765	Mersey	Channel C1 Buoy	E/WSFSH	EA	SD 240 044	53 31.83 N	03 08.80 W
766	Ribble	u/s 11 mile post	E/SFSH	EA	SD 340 261	53 43.60 N	03 00.00 W
767	Morecambe Bay	North Bay	I/WSFSH	EA	SD 280 603	54 02.00 N	03 06.00 W
768	Cumbria Coast	St Bees	I/WSFSH	EA	NX932 129	54 30.00 N	03 39.00 W
775	Irish Sea		I/WS (not benthos)	CEFAS	SC 347 172	53 37.50 N	04 30.00 W
776	Red Wharf Bay		I/F	CEFAS	SH 577 870	53 21.60 N	04 08.30 W
785	Off Lune/Wyre		I/W	CEFAS	SD 317 523	53 57.70 N	03 02.50 W
795	Off Morecambe Bay		O/W	CEFAS	SD 125 531	53 58.00 N	03 20.00 W
796	Offshore Morecambe Bay		O/F	CEFAS	SD 074 464	53 54.30 N	03 24.60 W
805	SE Isle of Man		O/WS	CEFAS	SC798 576	54 00.00 N	03 50.00 W
North Ireland							
845	Belfast Lough	BL5	I/WSFSH	DOE NI	NW 546 370	54 40.10 N	05 48.40 W
820	Bann Estuary	BR3	E/WSFSH	DOE NI	NW 016 938	55 08.92 N	06 41.07 W
880	Lough Foyle	Kilderry	I/WSFSH	DOE NI		55 04.00 N	07 13.50 W
825	Belfast Lough	IS1	I/WSF	DOE NI	NW 683 436	54 44.00 N	05 36.00 W
806	Irish Sea	NMP4	O/SFW	DARDNI	SB 916 886	54 15.00 N	05 12.00 W
807	Irish Sea	NMP5	O/SFW	DARDNI	SB 704 561	53 57.00 N	05 30.00 W
808	Irish Sea Buoy	Buoy	O/SFW	DARDNI	SB 607 380	53 47.00 N	05 38.00 W
809	Strangford Lough	SAC	I/SFWSH	DARDNI	NW 669 139	54 28.00 N	05 35.84 W
815	Dundrum Bay	IS2	O/SFW	DARDNI	SB 710 691	54 04.00 N	05 30.00 W
815	Dundrum Bay	IS2	F	CEFAS			
865	North Channel	NC2	O/SFW	DARDNI	NW 521 834	55 04.99 N	05 53.12 W
875	North Antrim Coast	NC1	O/SFW	DARDNI	NR 094 139	55 20.00 N	06 35.00 W

Appendix 13 - OSPAR Action Plan

OSPAR Action Plan 1998 – 2003
Update 2000

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OSPAR Action Plan 1998 – 2003

(Update 2000)

1. Introduction

1. In implementing the OSPAR Convention, 1992 the general objective of OSPAR is to prevent and eliminate pollution of the maritime area of the Convention and to ensure that the ecosystems of the maritime area are in a sustainable, sound and healthy condition and that human health is protected. In 1998 and 1999 the Commission adopted strategies for the purposes of directing its work in the medium to long term in the following five main areas:

- a. protection and conservation of ecosystems and biological diversity (cf. reference number 1998-19);
- b. hazardous substances (cf. reference number 1998-16);
- c. radioactive substances (cf. reference number 1998-17);
- d. eutrophication (cf. reference number 1998-18).
- e. environmental goals and management mechanisms for offshore activities (cf. reference number 1999-12)

Together with the Joint Assessment and Monitoring Programme (cf. Joint PARCOM and OSCOM Recommendation 95/1), these documents form a vital basis of the present Action Plan for the period 1998-2003.

2. Actions in these areas for the short to medium term are set out in chapters 2-6 of this Action Plan. Assessment activities mentioned in the chapters 2-5 should be read in conjunction with chapter 6. A quinquennial review of progress achieved through these actions is addressed in chapter 7. Such a review should, for the first time, take place by the next Ministerial Meeting of the Commission in 2003. Chapter 8 sets out actions for co-operation with, and assistance to, other international organisations.

3. In addition to this, the Commission will:

- a. review progress under this Action Plan annually, update it as necessary and adjust priorities for annual work programmes in order to deploy to the best effect the inevitably finite resources available to OSPAR and the Contracting Parties;
- b. keep under review the implementation of the existing measures and of measures arising from this Action Plan;
- c. adopt, on an annual basis, detailed work programmes for its permanent Committees as means to implement this Action Plan. All permanent Committees work in accordance with their terms of reference. On the basis of this Action Plan, specific emphasis shall be given to the tasks specified at the end of each chapter.

4. Activities to implement the OSPAR Action Plan 1998-2003 carried out in the 1999/2000 intersessional period are reported in the 1999/2000 Annual Report of the OSPAR Commission.

2. Protection and conservation of ecosystems and biological diversity

2.1. Basis for action

5. Environmental measures adopted by OSPAR which aim at the reduction of pollution of the maritime area may be insufficient to secure adequate protection for certain species and habitats in the maritime area. For this reason, OSPAR adopted in July 1998 a new Annex V and a new Appendix 3 to the 1992 OSPAR

Convention¹. In accordance with the OSPAR strategy on this issue, action will be taken aimed at protecting and conserving the ecosystems and the biological diversity of the maritime area affected, and restoring, where practicable, marine areas which have been adversely affected.

2.2. Activities

6. The Commission will:

- a. develop and compile criteria and guidance for the selection of species and habitats and apply this for:
 - (i) the compilation of lists of e.g. threatened or declining species and of threatened habitats;
 - (ii) the selection of species and habitats which need to be protected;
 - b. carry out an assessment of the actual or potential impact of the human activities listed in Annex 1²;
 - c. carry out an assessment of marine areas which have been adversely affected;
 - d. collect and evaluate information concerning existing protection programmes for marine species and habitats which are already protected;
 - e. draw up programmes and measures including, as appropriate:
 - (i) a system of specific areas or sites which need to be protected and plans to manage such areas or sites;
 - (ii) control of specific human activities that have an actual or potential adverse impact on species and habitats;
 - (iii) protection of marine species, habitats or ecological processes that appear to be under immediate threat or subject to rapid decline;
 - (iv) restoration, where practicable, of marine areas which have been identified as being adversely affected;
 - f. develop and implement a biological component of the Joint Assessment and Monitoring Programme aimed at assessing the status of the biological diversity of the maritime area.
7. Work under the Commission will also be carried out to:
- a. describe BEP in relation to dredging operations producing material for dumping and develop appropriate measures;
 - b. develop appropriate criteria, guidelines and procedures with regard to matter placed in the maritime area for a purpose other than that for which it was originally designed or constructed.

3. Hazardous substances

3.1. Basis for action

8. Hazardous substances can reach the marine environment from a number of sources by a variety of pathways and may pose a risk to human health or the marine environment. Action will be taken aimed at implementing the objective of the Commission to prevent pollution of the maritime area by continuously reducing discharges, emissions and losses of hazardous substances, with the ultimate aim of achieving concentrations in the marine environment near background values for naturally occurring substances and

1 Annex V and Appendix 3 will enter into force 30 days after the ratification by seven Contracting Parties.

2 Activities related to the offshore industry will be addressed in chapter 6.

close to zero for man-made synthetic substances and to make every endeavour to move towards the target of the cessation of discharges, emissions and losses of hazardous substances by the year 2020.

3.2. Activities

3.2.1. Selection and prioritisation of hazardous substances

9. Taking into account that OSPAR 2000 adopted the outcome of the first pragmatical application of the dynamic selection and prioritisation mechanism for hazardous substances, including endocrine disruptors, (the DYNAMEC mechanism) and agreed upon a first revision of the OSPAR List of Chemicals for Priority Action (cf. Annex 2), the Commission will:

- a. further elaborate and refine, by OSPAR 2001, the DYNAMEC mechanism;
- b. give priority to the development of programmes and measures for the substances on the OSPAR list of chemicals for priority action (cf. Annex 2). This Annex will be updated from time to time on the basis of the results of future applications of the DYNAMEC mechanism.

3.2.2. Substitution of hazardous substances

10. The Commission will develop procedures for identifying less hazardous or preferably non-hazardous substitutes for hazardous substances used both on land and offshore³. Priority will be given to identifying relevant substitutes for the hazardous substances on the OSPAR list of chemicals for priority action.

3.2.3. Development of programmes and measures to combat pollution

11. The Commission will:

- a. prepare as a basis for the development of programmes and measures with respect to the substances and groups of substances listed in Annex 2:
 - (i) background documents in order to identify:
 - the sources of these substances and their pathways to the marine environment;
 - the choice for new or additional action or programmes and measures to be taken by OSPAR;
 - (ii) where necessary, descriptions of Best Available Techniques (BAT) and/or Best Environmental Practices (BEP);
- b. adopt appropriate programmes and measures (including BAT/BEP) with a view to continuously reducing discharges, emissions and losses of hazardous substances;
- c. give special attention to the development and adoption of programmes and measures for reducing the generation and the use of hazardous substances on the OSPAR list of chemicals for priority action;
- d. review OSPAR BAT/BEP measures in accordance with the agreed timetable (cf. Reference number 2000-09) and taking into account, *inter alia*, the progress achieved in the development of BAT Reference Documents under Council Directive 96/61/EC concerning integrated pollution prevention and control.

12. Work under the Commission will also be carried out to consider the need for specific measures for the reduction of anthropogenic loads in dredged material to be dumped at sea.

³ With respect to uses offshore, the principle of substitution has been taken onboard in the new measures adopted at OSPAR 2000 with respect to the control of the use and discharge of offshore chemicals.

3.2.4. Monitoring

13. In accordance with the Commission's Joint Assessment and Monitoring Programme (JAMP) and taking into account work in other forums, the Commission will continue to collect qualitative and quantitative data and information to identify environmental problems with regard to hazardous substances and to this end:

- a. establish inputs of hazardous substances to the marine environment for:
 - (i) atmospheric inputs, including an inventory of emissions to air and the monitoring of atmospheric pollutants;
 - (ii) riverine inputs and land-based discharges directly into the marine environment differentiating, where possible, anthropogenic inputs;
 - (iii) discharges and emissions from particular sectors (including offshore installations) or activities (including the dumping of materials);
 - (iv) inputs of selected substances (e.g. via pilot studies to establish a detailed overview);
- b. monitor hazardous substances in relevant compartments of the marine environment (Coordinated Environmental Monitoring Programme) and, in particular:
 - (i) develop and implement programmes and models to provide suitable monitoring data (e.g. surveys) concerning hazardous substances and their effects in the maritime area⁴;
 - (ii) develop and apply screening methods for hazardous substances not normally monitored particularly those prioritised by the DYNAMEC Mechanism;
 - (iii) give priority to the development of suitable monitoring and testing techniques for endocrine disruptors;
 - (iv) conduct, on the basis of an intercomparison exercise, a concerted survey of the maritime area to gauge the spatial extent of any adverse effects arising from exposure to endocrine disruptors.

3.2.5. Assessment

14. The Commission will continue to:

- a. assess whether there are reasonable grounds for concern with regard to specific hazardous substances (in particular when there is a lack of relevant risk assessment or monitoring data), and will, to the extent possible, initiate immediate programmes to help characterise the risks connected to such substances;
- b. compile and consider the development and use of tools and criteria (including guidance for their use) such as:
 - (i) background/reference values;
 - (ii) ecotoxicological assessment criteria;
 - (iii) EQOs and EcoQOs where applicable;
 - (iv) statistical techniques and mathematical models;for assessing inputs to the maritime area and for evaluating the environmental conditions in sea areas.

15. Furthermore, the Commission will:

4 In doing so, the Commission will bear in mind, *inter alia*, the need for additional protection for North Sea ecosystems, in particular for spawning grounds and nursery areas for fisheries resources.

- a. further develop, in cooperation with the EC, a common approach with respect to risk assessment methodology for the marine environment. This process should take account any relevant tools for risk assessment for marine ecosystems that are under development within OSPAR and/or other international fora and to join efforts in order to accelerate progress in this field;
- b. invite industry to cooperate in fulfilling its objective with regard to hazardous substances.

16. The Commission and Contracting Parties, individually or jointly, will endeavour to maintain and develop further a constructive dialogue on the reduction of hazardous substances with all parties concerned, including producers, manufacturers, user groups, authorities and environmental NGOs. This should ensure that all relevant information, such as reliable data on production volumes, use patterns, emission scenarios, exposure concentrations and on properties of substances, is available for the work of the Commission in connection with this strategy.

4. Radioactive substances

4.1. Basis for action

17. Radioactive substances can reach the marine environment from a number of sources by a variety of pathways and may pose a risk to human health or marine environment. Action will be taken aimed at implementing the objective to prevent pollution of the maritime area from ionising radiation through progressive and substantial reductions of discharges, emissions and losses of radioactive substances, with the ultimate aim of concentrations in the environment near background values for naturally occurring radioactive substances and close to zero for artificial radioactive substances. In achieving this objective, the following issues should, *inter alia*, be taken into account:

- a. legitimate uses of the sea;
- b. technical feasibility;
- c. radiological impacts to man and biota.

4.2. Activities

18. The Commission will:

- a. identify and assess the need for action and prioritise by the year 2003 radioactive substances and/or human activities which give rise for concern about their impact on the marine environment.

As a basis for this, the Commission will continue to collect data and information concerning radioactive substances, in particular with regard to inputs from all sources and concentrations and effects in the marine environment. In doing so, the Commission will make full use of the results of the MARINA Project⁵ (and its update) in order to put more emphasis on assessing biological and ecological effects;

- b. undertake to develop environmental quality criteria for the protection of the marine environment from adverse effects of radioactive substances and report on progress by the year 2003;
- c. develop programmes and measures, thereby ensuring the application of BAT/BEP, for nuclear sectors and, as appropriate, for non-nuclear sectors with discharges, emissions or losses of radioactive substances, including, where appropriate, clean technology;

5 The radiological exposure of the population of the European Community from radioactivity in North European water – Project “MARINA”, EUR 12483, 1990.

- d. prepare proposals for actions to be initiated / taken in the framework of OSPAR, in the light of the results of a review and assessment of the reprocessing and non-reprocessing options for spent fuel management (carried out by the Nuclear Energy Agency);
- e. assess the combined effect of the national plans provided by Contracting Parties for achieving the objective of the OSPAR Strategy with regard to Radioactive Substances, to the extent required by its timeframe to 2020.

5. Eutrophication

5.1. Basis for action

19. The occurrence and distribution of eutrophication effects due to high loads of nutrients in certain parts of the North Sea are issues of concern. Elevated nitrogen and phosphorus concentrations and disturbances in the natural nutrient ratios are clearly detectable not only in many estuaries, but also along most of the coastline from northern France to Denmark, sections of the south-eastern English coast, and in parts of the Skagerrak and the Kattegat. It is generally acknowledged that these factors can be the cause of increased phytoplankton biomass and bloom duration, although the elevated nutrient concentrations and the disturbances in their natural ratios are not always the reasons for the occurrence of algal blooms.

20. Action will be taken aimed at implementing the objective of the Commission to combat eutrophication in the OSPAR maritime area, in order to achieve and maintain a healthy marine environment where eutrophication does not occur.

5.2. Activities

5.2.1. Assessment of the eutrophication status

21. The Commission will:

- a. ensure that the Common Procedure for the Identification of the Eutrophication Status of the Maritime Area (the "Common Procedure", reference number 1997-11) is applied, as a matter of priority, in order to characterise each part of the maritime area as a problem area or a potential problem areas or a non problem area with regard to eutrophication.
- b. examine, taking into account the results of the application of the screening procedure (the first step of the Common Procedure), the reporting by Contracting Parties on the implementation of the comprehensive procedure, an iterative process, which may be applied as many times as necessary, and which should enable a classification of the maritime area, for the first time by the year 2002, in terms of the areas as mentioned in §a. above;

22. Furthermore, the Commission will, as a matter of priority:

- a. carry out an evaluation of the situation in the maritime area that would be expected following the implementation of agreed measures;
- b. compile information on agreed methodologies and monitoring in support of the classification of areas;
- c. verify progress and performance of them;
- d. develop them where they do not already exist.

5.2.2. Development and implementation of measures to combat eutrophication

23. The Commission will, as a matter of priority:

- a. further develop and adopt harmonised quantification and reporting procedures for nutrients as a basis for transparent, reliable and comparable reports, including relevant sources, basic figures, calculation methods and emission factors;
- b. review the implementation of, and reporting on PARCOM Recommendation 88/2 on the Reduction in Inputs of Nutrients to the Paris Convention Area;
- c. review the implementation of national action plans in the context of PARCOM Recommendation 89/4 on a Coordinated Programme for the Reduction of Nutrients;
- d. review the implementation of, and reporting on, any national or international measures as adopted by individual Contracting Parties for the reduction of nutrients in discharges/emissions from industry, sewage treatment plants, agriculture and other diffuse sources.

In particular for the agricultural sector, the Commission will carry out an analysis of whether (and in what areas) existing measures and their implementation by Contracting Parties are insufficient or inadequate;

- e. evaluate the experience gained and the results achieved with the OSPAR Strategy to Combat Eutrophication (e.g. in the light of the ongoing activities to fulfil the 50% reduction target) by the combined use of information from monitoring, research and modelling against a set of assessment criteria;

and on this basis:

- f. assess the need for the setting of further reduction targets;
- g. develop further relevant source-reduction measures (including BAT/BEP) needed to complement or update existing measures;
- h. consider the updating of PARCOM Recommendations 88/2, 89/4 and PARCOM Recommendation 92/7 on the Reduction of Nutrient Inputs from Agriculture into Areas where these Inputs are Likely, Directly or Indirectly, to Cause Pollution.

24. In doing so, the Commission will promote good agricultural practice and good housekeeping in industry and sewage treatment.

25. At a later stage, and taking into account the review of the OSPAR Strategy to Combat Eutrophication and of the quinquennial reports on progress achieved, the Commission will develop and implement more stringent measures in areas where BAT and BEP are insufficient to achieve the targets adopted to combat eutrophication.

5.2.3. Monitoring and tools for assessment

26. With a view to enabling the application of the Common Procedure, the Commission will:

- a. as a matter of priority, further develop and adopt a set of quantified assessment criteria and means for interrelating them for use in the characterisation of problem areas, potential problem areas and non-problem areas with regard to eutrophication (cf. §22. above). The Commission will also implement the Nutrient Monitoring Programme, which provides the basis for assessing the eutrophication status;
- b. continue the following actions:
 - (i) develop the appropriate scientific basis and an agreed methodology to derive ecological quality objectives⁶;
 - (ii) develop procedures for the use of information from monitoring, research and modelling as well as for the use of assessment criteria of the Common Procedure;

⁶ As defined in OSPAR's Strategy to Combat Eutrophication.

- c. at a later stage, adopt and apply ecological quality objectives taking into account the review of the OSPAR Strategy to Combat Eutrophication and of the quinquennial reports on progress achieved.

6. Offshore Activities

6.1. Basis for action

27. At OSPAR/MMC 1998, Ministers agreed that environmental goals should be set for the offshore oil and gas industry and improved management mechanisms established to achieve them. In 1999, OSPAR adopted a strategy for this purpose with a view to directing its future work with regard to the development of programmes and measures:

- a. needed to prevent, control and eliminate pollution under Annex III of the OSPAR Convention;
- b. to be adopted under Annex V of the OSPAR Convention, once it has entered into force, following the identification of relevant human activities by the application of the criteria in Appendix 3 of the OSPAR Convention;

6.2. Activities

6.2.1. Establishing goals and measures

28. The Commission will:

- a. establish and periodically review environmental goals for offshore activities;
- b. assess the extent to which existing programmes and measures meet, or will meet, these environmental goals;
- c. where this assessment shows it to be necessary, revise existing measures and/or develop and adopt new measures.

29. Furthermore, the Commission will promote:

- a. the development and implementation by the offshore industry of environmental management mechanisms, including elements for auditing and reporting, which are designed to achieve both continuous improvement in environmental performance and the environmental goals referred to above;
- b. the development of BAT/BEP for offshore activities for the purpose of giving effect to the principle of sustainable development.

6.2.2. Prevention and elimination of pollution

30. The Commission will develop programmes and measures to identify, prioritise, monitor and control (i.e. to prevent and/or reduce and/or eliminate) the emissions, discharges and losses of substances which reach or could reach the marine environment and which cause, or are likely to cause, pollution. This will include:

- a. the review and improvement of the measures adopted at OSPAR 2000 with respect to a harmonised mandatory control system for the use and reduction of the discharge of offshore chemicals;
- b. the drawing up of programmes and measures in relation to the use and discharge of offshore chemicals which are on the OSPAR List of Chemicals for Priority Action (cf. Annex 2);
- c. the development of programmes and measures for:

- (i) the reduction of discharges, or substitution, of other chemicals after establishing priority in accordance with paragraph 3.3(a) of the strategy;
- (ii) the reduction of discharges of oil from offshore sources;
- (iii) the reduction of discharges of radioactive substances.

6.2.3. Protection and conservation of the maritime area

31. In line with OSPAR's Strategy on the Protection and Conservation of the Ecosystems and Biological Diversity of the Maritime Area, the Commission will carry out assessments of the potential adverse effects, other than pollution, arising from offshore activities on the ecosystems and biological diversity of the maritime area. Among the first candidate list of activities for assessment are:

- a the exploration for oil and gas;
- b. the placement of structures for the exploitation of oil and gas.

7. Overall Evaluation and Review of Progress

7.1. Basis for action

32. In accordance with Article 6 of the Convention, OSPAR shall undertake and publish at regular intervals joint assessments of the quality status of the marine environment and of its development, for the maritime area or for regions or sub-regions thereof. Such assessments should include:

- a. an evaluation of the effectiveness of measures taken and planned;
- b. an identification of priorities for further action.

Furthermore, Article 22 of the Convention stipulates that Contracting Parties shall report to OSPAR at regular intervals on measures taken by them for the implementation of Decisions and Recommendations adopted under the Convention.

7.2. Activities

7.2.1. Assessment and Monitoring

33. The Commission will continue to work in accordance with the JAMP. The findings of the QSR 2000 will be taken into account in the quinquennial review of the OSPAR strategies regarding:

- a. protection and conservation of ecosystems and biological diversity;
- b. hazardous substances;
- c. radioactive substances;
- d. eutrophication;
- e. environmental goals and improved management mechanisms for the offshore oil and gas industry.

34. The Commission will review the Joint Assessment and Monitoring Programme (JAMP) aimed at the adoption of a revised JAMP in the year 2003. This review will take into account:

- a. experience gained with the present JAMP;
- b. the results of activities set out in the previous chapters and the QSR 2000;
- c. the list of human activities at Annex 1 and the hazardous substances on the OSPAR list of chemicals for priority action listed in Annex 2.

The revised JAMP will also define activities required to establish further QSRs in the decade following the finalisation of the QSR 2000.

7.2.2. Compliance and effectiveness assessment

35. The Commission will:

- a. assess reports of Contracting Parties on the implementation of programmes and measures applicable under the Convention;
- b. assess the effectiveness of these programmes and measures with a view to improving the protection of the marine environment.

8. International cooperation

36. The Commission will develop further action with regard to international cooperation. In particular cooperation with "neighbouring" organisations will be intensified. Cooperation with other organisations will be channelled via the UNEP Secretariat for the Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA).

Human activities to be assessed with regard to their impact on the marine environment, its species, habitats and biological diversity

Human Activity	Lead Country
1. Sand and gravel extraction	Denmark
2. Dredging for navigational purposes, other than within harbours	The Netherlands
3. Placement of structures for the exploitation of oil and gas	Norway
4a. Construction or placement of artificial islands	
4b. Construction or placement of artificial reefs	Germany, Spain and the UK
4c. Installations and structures:	
• Offshore windmill parks	Denmark
5. Land reclamation	
6. Tourism	Spain

Activities for assessment on a later date

1. Exploration for oil, gas and solid minerals
2. Placement of cables and pipelines
An assessment of this activity will include an assessment of the scope for action under other international law
3. Recreational activities
These activities will be examined with the aim of identifying whether specific activities within this group would require a further assessment
4. Introduction of alien or genetically modified species, whether deliberately or unintentionally
5. Coastal defence

OSPAR List of Chemicals for Priority Action (Up-date 2000)

Substance / group of substances	CAS No	IUPAC name	Identified at *	Lead country
4-tert-butyltoluene	98-51-1	benzene, 1-(1,1-dimethylethyl)-4-methyl-	OSPAR 2000	**
Brominated flame retardants			OSPAR/MMC 1998	Sweden
Cadmium			OSPAR/MMC 1998	**
Certain Phthalates – Dibutylphthalate and Diethylhexylphthalate			OSPAR/MMC 1998	Denmark & France
Dicofol	115-32-2	benzenemethanol, 4-chloro-.alpha.-(4-chlorophenyl)-.alpha.-(trichloromethyl)-	OSPAR 2000	**
Dodecylphenol	732-26-3	phenol, 2,4,6-tris(1,1-dimethylethyl)-	OSPAR 2000	**
Endosulphan	115-29-7	6,9-methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-,3-oxide	OSPAR 2000	Germany
	77-47-4	1,3-cyclopentadiene, 1,2,3,4,5,5-hexachloro-	OSPAR 2000	The Netherlands
Hexachlorocyclohexane isomers (HCH)			OSPAR/MMC 1998	Germany
HMDS	107-46-0	disiloxane, hexamethyl-	OSPAR 2000	**France
Lead and organic lead compounds			OSPAR/MMC 1998	Norway
Mercury and organic mercury compounds			OSPAR/MMC 1998	United Kingdom
Methoxychlor	72-43-5	benzene, 1,1'-(2,2,2-trichloroethylidene)bis(4-methoxy	OSPAR 2000	**
Musk xylene			OSPAR/MMC 1998	Switzerland
Nonylphenol/ethoxylates (NP/NPEs) and related substances			OSPAR/MMC 1998	Sweden
Octylphenol	140-66-9	phenol, 4-(1,1,3,3,tetramethylbutyl)-	OSPAR 2000	United Kingdom
Organic tin compounds			OSPAR/MMC 1998	The Netherlands
Pentachlorophenol (PCP)			OSPAR/MMC 1998	Finland

Substance / group of substances	CAS No	IUPAC name	Identified at *	Lead country
Polyaromatic hydrocarbons (PAHs)			OSPAR/MMC 1998	Norway
Polychlorinated biphenyls (PCBs)			OSPAR/MMC 1998	Germany & Belgium
Polychlorinated dibenzodioxins (PCDDs) Polychlorinated dibenzofurans (PCDFs)			OSPAR/MMC 1998	} Denmark & Belgium
Short chained chlorinated paraffins (SCCP)			OSPAR/MMC 1998	Sweden
TBBA	79-94-7	phenol, 4,4'-(1-methylethylidene)bis[2,6-dibromo-	OSPAR 2000	United Kingdom
Trichlorobenzene	87-61-6	benzene, 1,2,3-trichloro-	OSPAR 2000	Belgium (Flemish Region of Belgium) on the condition that another CP joins as co-lead country
1,2,4-trichlorobenzene	120-82-1	benzene, 1,2,4-trichloro-	OSPAR 2000	
1,3,5-trichlorobenzene	108-70-3	benzene, 1,3,5-trichloro-	OSPAR 2000	

* OSPAR/MMC 1998: OSPAR Agreement reference number 1998-16 (Annex 2 to the OSPAR Strategy with regard to Hazardous Substances)

OSPAR 2000: OSPAR Agreement 2000-10

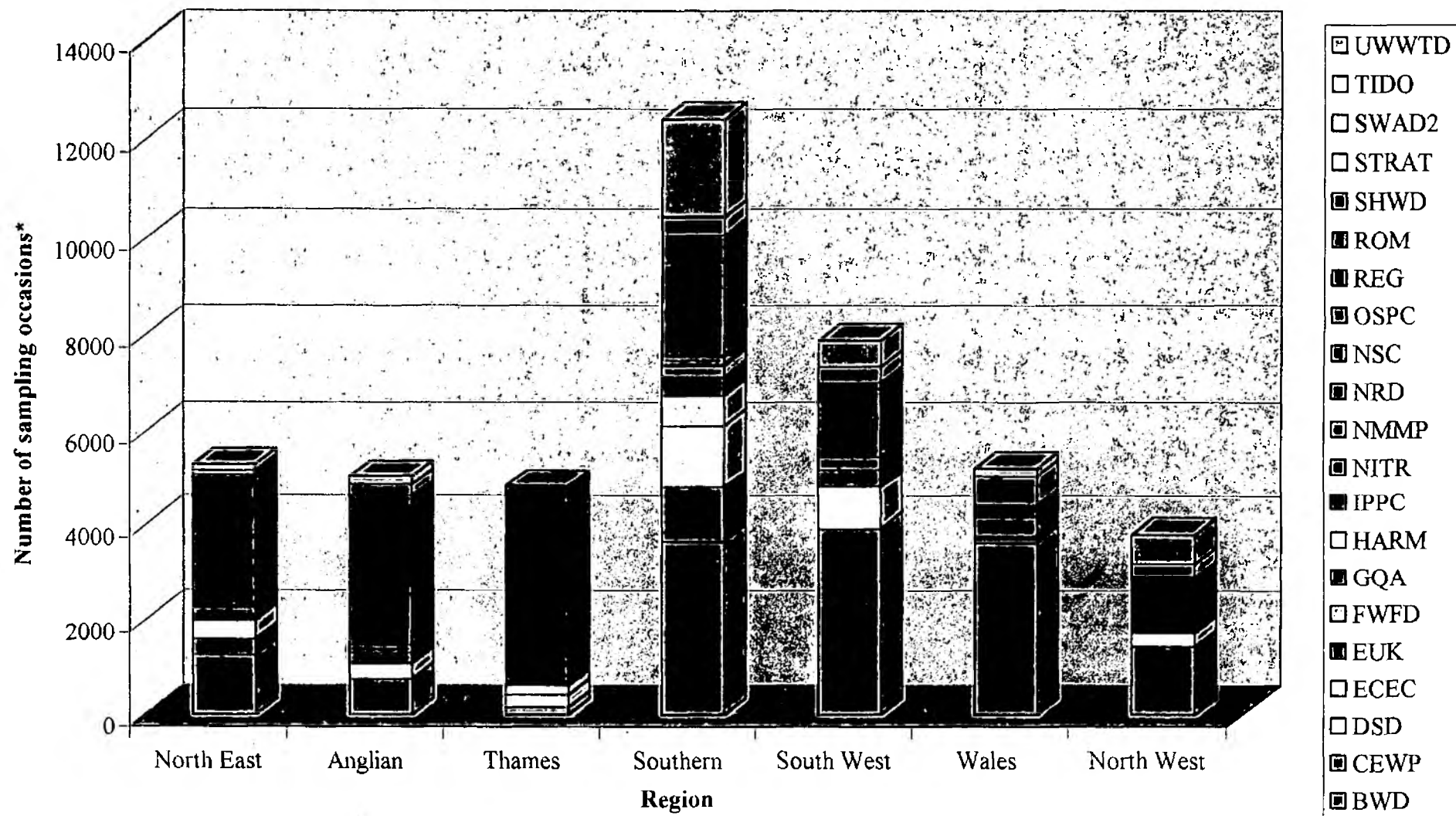
** These substances have currently no lead country to further the work within OSPAR and will have to be considered at a later date.

Appendix 14 - Water Quality: Regional Programmes by Driver Including Primary and Embedded Sampling.

Abbreviations for Drivers from WQ Database

NMMP	-	National Marine Monitoring Programme
BWD	-	Bathing Water Directive
NRD	-	National Research & Development
OSPC	-	Oslo Paris Commision
UWWTD	-	Urban Waste Water Directive
HHWD	-	Shellfish Water Directive
DSD	-	Dangerous Substances Directive
ROM	-	Regional Operational Monitoring
ECEC	-	Environmental Change Network
EUK	-	Effluent Monitoring UK Commitments
HARM	-	Harmonised Monitoring Scheme
NSC	-	North Sea Conference
REG	-	Regulatory Monitoring
NTR	-	Nitrate Directive
IPPC	-	Integrated Pollution Prevention and Control
TIDO	-	Tioxide Directive
GQA	-	General Quality Assessment
STRAT	-	

Water Quality Database - Sampling effort by Driver Primary and Embedded



* where sampling occasion = number of sites X frequency of sampling

Appendix 15 - Regional Vessels

Region	Name of Vessel and MCA Reg No.	Location	Details of Vessel Make, Size, HP, No. of Engines	Purchase Cost and Age	Valuation 1999/2000	Valuation 2000/2001	Responsible Officer and Department
Anglian	Teal M99WB0060033	Ipswich	Crompton	19k 5 years	327	394	
Anglian	Clues EAU 1519 3066	Ely	Dory 16 ft		40	40	Mervyn Day
Anglian	Terry Kaye	Brampton	Dory 16 ft		250	250	Joe Crilly
Anglian	Hardy Work Boat Flt No. 682	Ely	Hardy	£15,775 Mar 1987	100	100	Paul Wilkanowski
Midlands	Anguilla M01WB0050035	Tewkesbury	Delta RIB 5.4 mtr 2 x Honda 50 hp	11k 4 years	75.5	81	A Starke
North East	Hurricane M00WB0060028 CAT 3	Newcastle	6.7 mtr RIB 2 x 90 hp engine	60k 2 years old	428	350	Phil Swalle Fisheries Enforcement
North East	Black Pig CAT C	Newcastle	4.0 mtr RIB 1 x 80 hp engine	5k 16 years old	400	400	Phil Swalle Fisheries Enforcement
North East	Northumbrian Rivers	Newcastle	12m solid hull Patrol Craft	Sold 2001 due to GIA cuts	750	750	Phil Swalle Fisheries Enforcement
North East	Endeavour Not certified yet CAT 3	Willerby	5.5 mtr RIB 1 x 130 hp engine 1 x 8 hp engine	25 k 6 years old	32	32	Mark Sykes EP Monitoring
North East	Noras Challenge Not certified yet CAT 3	Willerby	6.0 mtr RIB 2 x 70 hp engines	25k 12 years old	32	32	Mark Sykes EP Monitoring
North East	Firefly CAT C	Darlington	6.4 mtr RIB 2 x 75 hp engines	10k 10 years old	200	150	Mark Sykes Environment Protection
North East	Costa Searider CAT 3	Pickering	6.5 mtr RIB 2 x 70 hp engines	30k 10 years old	100	100	John Shannon Fisheries
North East	Sea Hog CAT C	Pickering	4.0 mtr RIB 1 x 20 hp engine	4k 2 years old	150	150	John Shannon Fisheries
North West	Ribble Perfect M99WB00500387	Fisheries Clifton Marsh Depot	Osprey Eagle RIB 5.6 mtr 1 x 100 hp 4 stroke	5k 1989	55	88	Steve Leach Fisheries
North West	Sea Fury Awaiting MCA No.	Hoyle Street Depot Warrington	Chinook Sea Fury 5.8 mtrs	9k 1996	100	120	Keith Sharps Marine & Special projects
North West	Sea Jel Awaiting MCA No.	Eastham Lock, Manchester Ship Canal	Taskforce Length 8.1 mtr Breadth 2.85 mtr	50k 1988	400	420	Peter Jones Marine & Special Projects
North West	Protector Awaiting MCA No.	Davenham Fisheries Depot	Chinook Sea Fury Length 5.8 mtrs Hardy 24	9.5k 1994	80	70	Graham Harrison Fisheries
North West	Solway Perfect M00WB0070001	Maryport Marina West Cumbria	Length 7.31 mtr Breadth 2.74 mtr 1 x Volvo 6 cyl Diesel	36k 1990	55	67	Vic Semple Fisheries
North West	Sea Osprey M00W0040003	Fisheries Depot Bridgend South Cumbria	Tornado International RIB Length 5.3 mtr Breadth 2.2 mtr	5k 1995	150	170	Pete Evoy
South West	Nemesis Awaiting MCA No.	Teignmouth	Ribtec 9.8 mtr RIB 2 x 130 hp Honda o/b	68k June 1999	258	350	Derek Clifton Fisheries
South West	Amy Louise B0060075	Fowey	Ribtec 6.5 mtr RIB 1 x 130 hp Honda o/b	26k Jan 2000	42	160	Andy Williams Fisheries
South West	Jack Russel B0060067	Bideford	Ribtec 6.5 mtr RIB 1 x 130 hp Honda o/b	£25,500 Oct 1998	87	81	Bob Collett Fisheries
South West	Poole 'C' B0060069	Wareham	6 mtr Alloy Poole Canoe 1 x 50 hp Honda o/b	5k 1981	102	97	Clive Tyler Fisheries

Region	Name of Vessel and MCA Reg No.	Location	Details of Vessel Hull No. size, HP No. of Engines	Purchase Cost and Age	Utilisation Hrs		Responsible Officer and Department
					1999/2000	2000/2001	
South West	Survey 1 B0060063	Penarth	Boston Whaler 6 mtr 2 x Honda 75 hp o/b	£24,500 1994			NCEDS
South West	Turnstone B0060064	Bradney	Avon 6.0 mtr RIB 2 x Honda 90 hp o/b	19k 1993	79	67	Geoff Way Fisheries
South West	Katherine B B0060065	Clyst Honiton	Ribtec 6.00 mtr RIB 1 X 130 HP Honda o/b	24.8k 1997	287	243	Jenny Watkinson WQ, Blandford
South West	Jamie Lee B0060073	Bodmin	Ribtec 6.5 mtr RIB 2 X Mercury 75 hp o/b	26k 1998	289	276	Jeff Headon Water Quality
South West	Rosie B0060072	Wadebridge	Ribtec 6.00 mtr RIB 2 x Honda 50 hp o/b	26k 1996	87	96	Tom Smith Fisheries
South West	Silvanus B0070071	Plymouth	Avon 7.4 mtr RIB 2 x Honda 130 hp o/b	49k Feb 1993	241	282	Tam Sneddon Fisheries
South West	Draco Awaiting No.	Bridgwater	Ribtec 6.5 mtr RIB 1 x Honda 130 hp o/b	£25,400 Dec 2000			Adrian Hampton Water Quality
South West	Kerry Louise	Clyst Honiton	Avon 4.65 mtr RIB 1 x Mercury 50 hp o/b	7k 1994	67	88	Trevor Cronin Water Quality
South West	Pamala	Bodmin	Avon 4.65 mtr RIB 1 x Mercury 50 hp o/b	7k 1995	73	84	Rob Hocking Water Quality
South West	Teal	Chippenham	Ribtec 4.55 mtr RIB 1 x Honda 50 hp o/b	11k 1999	47	39	Geoff Way Fisheries
Southern	Cerberus FI BOM00081 3797 (Hull Number)	Medway Bridge Marina Rochester	Targa 27 Twin Volvo Z drives	86k March 1998	450	470	A Cansdale Env Prot Kent
Southern	RIB Pisces MSF 2003 REV 0297	Hythe Marina Southampton	6.4 mtr Chinook RIB 2 x 70 hp Yamahas	28K May 94	125	50	D Hunter Fisheries
Thames	RIB 1		Details not available				
Thames	RIB 2		Details not available				
Thames/ South East	MV Thames Champion	Barrier Gardens Pier, Thames Barrier, Charlton	Souter Marine Limited. 15.75 mtrs overall length 15 mtr waterline length 3.15 mtr Beam. Twin Sabre M265 TRI marine engines, 250 hp each, coupled two Hamilton 273 Water Jets	£279,560.00 accepted on the 19 May 1998	1650	1650	Martin Moore Tidal Operations
Thames/ South East	MV Thames Guardian	Barrier Gardens Pier, Thames Barrier, Charlton	Nelson 42 ft GRP fitted out for sampling. Twin Sabre Perkins Diesel engines 215 hp each	£60,000.00 Delivered in 1974	384	447	Richard Oalley EP Crossness
Welsh	Picton Awaiting MCA No. Fleet No. 060146	North Wales	5.95 mtr RIB 2 x 60 Mariners (2 Stroke)	40k 1995	90	150	
Welsh	Orkney 21 Fisher 1 Fleet No. 060147	South East	Orkney Day Angler 21 2 x 45 hp Honda 4 strokes	45k 1993	224	224	Mark Chapman
Welsh	Dell Quay Dory Fleet No. 060074	South West	Dell Quay Dory 17 2 x 50 hp Yamaha 2 stroke	20k 24/11/1998	10	16	Steve Barker Fisheries
Welsh	Hardy Challenger Fleet No. 06008 MOOWB0070085	South East	Hardy Fisherman 24 2 x 90 hp Honda 4 strokes	70k 12/12/1988	100	25	Steve Williams Fisheries