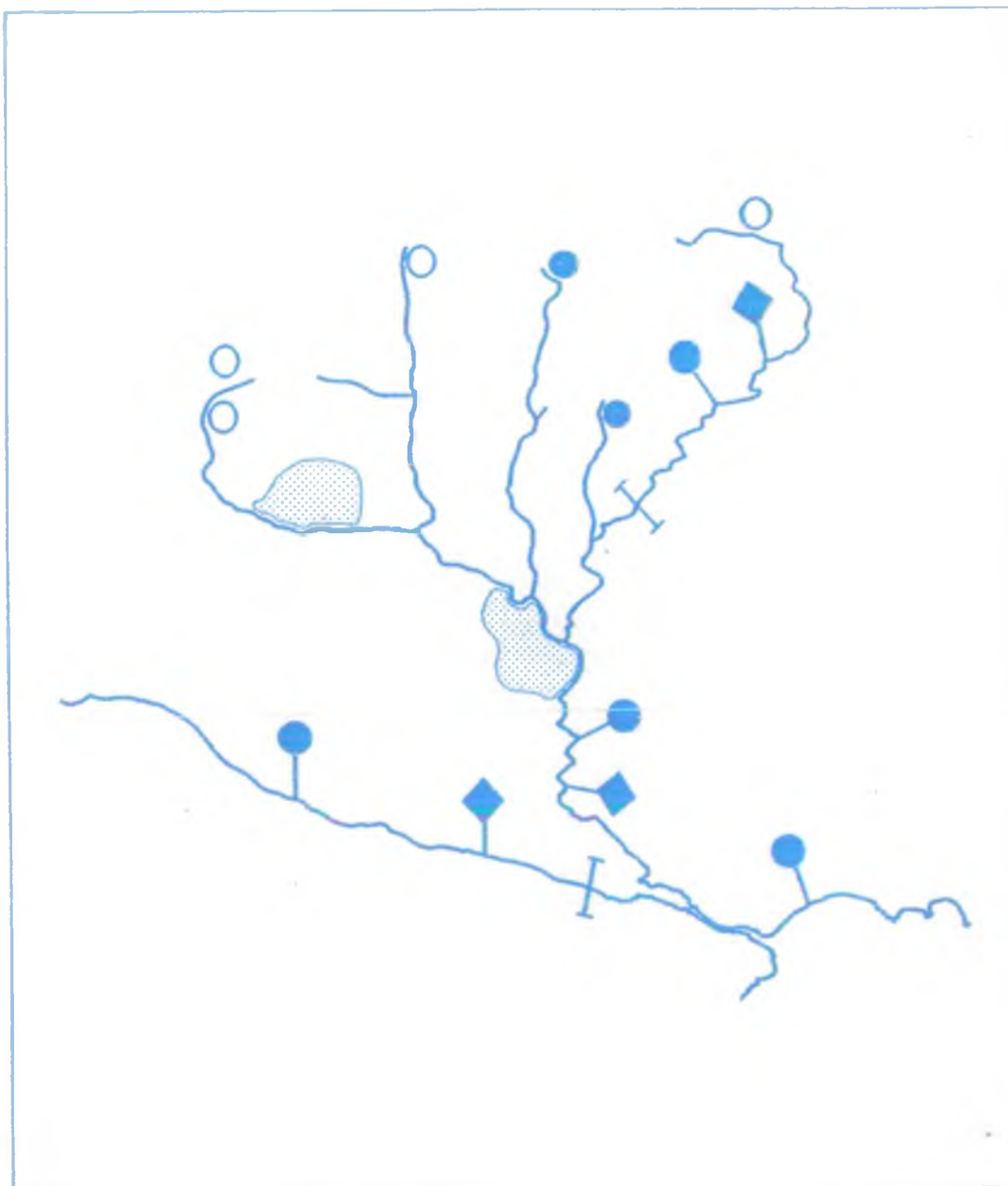




National Rivers Authority



Catchment Management Planning

April 1991

NATIONAL RIVERS AUTHORITY

CATCHMENT MANAGEMENT

PLANNING

APRIL 1991

ENVIRONMENT AGENCY



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APPENDICES

1. Questionnaire to NRA Regions on current CMP practice
2. Major catchments in England and Wales
3. Recent catchments plans produced by NRA Regions
4. Catchment Management Planning guidelines

Catchment Management Planning is a procedure designed to create a consistent framework within which the diverse responsibilities of the NRA can be applied within a catchment in a co-ordinated manner. A Catchment Management Plan (CMP) will result from a multi-functional and multi-use appraisal of a catchment which takes account of Functional Strategies; identifies present and defines future uses of water and associated land; identifies interaction and potential conflicts and proposes an action plan which allocates responsibilities for achieving improvements. In short, a CMP is the NRA's vision for a catchment.

This report reviews current CMP practice in the NRA and elsewhere in the UK and Europe; it discusses fundamental issues such as definitions, benefits and disadvantages; it recommends a policy framework and outlines the form of implementation and the resources needed within the present organisational structure, including management issues. It also includes Guidelines to enable Regions to develop plans in a structured way indicating when and how consultation should take place with external organisations.

The importance of CMPs is discussed particularly in relation to the Water Quality Function in connection with the setting and reviewing of statutory Water Quality Objectives. Given that the NRA expects to spend some £4000M on regulating and improving the environment over the next 10 years and will influence a much larger investment by other organisations, the estimated cost of £4M to produce CMPs for the majority of its catchments is considered to be worthwhile. However, it is recommended that, in the first instance, pilot studies of priority catchments in every Region should be commenced as soon as possible. There should be a national review in 1992 following completion of the first plans to ensure that experience is used to guide improvements to the procedures. Depending on this experience, CMPs should eventually be produced for all catchments in England and Wales.

- 2.1 A CMP will result from a multi-functional and multi-use appraisal of a catchment which:-
- takes account of Functional Strategies and objectives
 - identifies present and defines future:-
 - uses of water and associated land within the catchment
 - land use which influences the water environment
 - land drainage and flood defence activities
 - and sets appropriate standards for each, giving priority to statutory obligations.
 - identifies interaction and potential conflicts.
 - sets out an action plan to achieve the defined uses of water within the catchment, land use controls and land drainage and flood defence objectives.
 - the action plan will allocate responsibility for that action and will provide an investment framework. Commercial confidentiality will be preserved by publishing costs only as far as third parties allow.
- 2.2 Catchment Management Planning is not designed to replace the way in which catchments are being developed but rather to create a consistent framework within which the diverse responsibilities of the NRA can be applied within a catchment in a co-ordinated manner. Although intended to take account of the interests of all NRA Functions, the importance of CMPs to the Water Quality Function is notable because of the link with statutory Water Quality Objectives. Timetable consideration constrain the use of CMPs in setting WQOs in the early years, but are likely to be extremely useful when the latter are revised from 1997 onwards.
- 2.3 During preparation of a CMP the NRA will consult widely with external organisations including local authorities, sewerage and water undertakers, and other organisations with an interest in or likely to be affected by catchment development. Statutory Committees should be consulted first and later invited to consider the responses of other consultees and advise where differences have to be resolved.
- 2.4 Output from the development of a CMP will be a short summary for wide circulation to the general public and a longer more detailed but straightforward report (the Catchment Management Plan) for circulation to committees and appropriate external organisations. More detailed technical documents will be produced, largely for internal use.
- 2.5 The planning period over which the CMP is prepared will depend upon the issues and options which relate to the catchment in question but typically are envisaged to cover at least a 10 year horizon with the plan being reviewed every 5 years, with updating as necessary.

- 2.6 A catchment for CMP purposes will include both inland waters, groundwater interaction and tidal waters. The aerial extent will be dictated by the problems to be solved but "catchments" are expected to range from 500 to 5,000km².
- 2.7 CMPs will assist the Corporate Planning process but will not be sufficiently comprehensive in the medium term to comprise a common building block for such plans.
- 2.8 Priority will be given to catchments:-
- where significant conflict exists between users of the water within the catchment;
 - where present 'standards' are not being met;
 - where significant development is planned which could have a major impact on the water environment;
 - although some objective criteria are proposed for inter-catchment prioritisation, statutory requirements will override other considerations.
- 2.9 For effective implementation, plans should be produced to standard guidelines recommended in the report. The guidelines consist of a number of discrete steps as follows:-
1. Set up a multi-functional catchment planning group.
 2. Identify current and future uses.
 3. Identify the objectives and standards for these catchment uses.
 4. Identify the current status of the catchment.
 5. Identify catchment shortfalls, priorities and options for actions.
 6. Produce draft CMP.
 7. Consultation
 8. Publish final CMP.
 9. Implement the plan.
 10. Monitor and update the plan.
- 2.10 Based on the current organisational structures, the introduction of a standard approach to catchment management planning will generate a significant workload in Regions which will require careful management to minimise disruption. The process will also require close monitoring to ensure that benefits are realised. The Group recommend that responsibility for the catchment management planning initiative in the Region should be assigned to a Senior Manager and that the co-ordination of the multi-functional CMP groups should be undertaken by a full-time Catchment Planning Co-ordinator.

- 2.11 To monitor the implementation of these recommendations, special regular progress reports should be made to Regional Management and Head Office. Funding should be spread across all Functions in proportion to their expenditure on the Plan. The cost of the Functional input and co-ordination should be assessed and recorded separately in each region.
- 2.12 The multi-functional Catchment Planning Group is a vital ingredient for success. The leader should be selected for his management skills and the members should include staff responsible for the operational management of the catchment in question.
- 2.13 The research and development requirements of CMPs have yet to be fully determined. In the early period, emphasis should be placed on establishing suitable standards in support of catchment uses. The NRA's need to better understand the relationships between different activities in catchments and to predict the consequences and costs of alternative remedial options will require further development of mathematical models.
- 2.14 The Group recommends that pilot studies of priority catchments in every Region should be commenced as soon as possible according to needs and resources, with at least one CMP being produced annually by each Region. There should be a national review in 1992 following completion of the first plans to ensure that experience is used to guide improvements. Depending on experience during this trial period, CMPs should eventually be produced for all catchments in England and Wales.
- 2.15 It is accepted that this report will require wide consultation within the NRA including Regional Committees before a major commitment is made. However, the Group believe that properly controlled pilot work should proceed in parallel.

- 3.1 Upon its formation by the Water Act 1989, the NRA inherited the regulatory, law enforcement and other functions of the former Regional Water Authorities in England and Wales. These authorities, set up by the Water Act 1973, had responsibility for all aspects of water management within their areas. Boundaries between authorities were defined by natural surface water catchment or hydrological boundaries, thereby facilitating integrated river basin management. Today the NRA is divided into ten Regions with the same catchment based boundaries as the predecessor authorities. Each Region is further subdivided into divisions, districts or areas primarily on a single or multicatchment basis, although these geographical areas may not be the same for all NRA functions.
- 3.2 Catchment Management Planning (CMP) is practised in most Regions but the form it takes, the functions it covers and emphasis placed upon it varies widely. Most CMP derives from the need to respond to demands in critical functions where the catchment is a logical and manageable unit for study. Thus, in one Region where water demands are critical, existing CMPs are the means for developing a water resources strategy. In another, where there is demand for urban development in flood risk areas, CMPs have been produced initially for flood defence and land drainage.
- 3.3 Only recently has catchment planning been on a multi-functional basis. The formation of the NRA with its unique blend of regulatory, operational and planning functions has created a new demand to look at water uses within a catchment and the interaction between them.
- 3.4 Many potential conflicts of water use are well known. For example, that between abstraction and discharge; flood defence and conservation; fisheries, navigation and other recreational pursuits.
- 3.5 Water, besides being a vital aspect of the local environment, is also closely linked to the local economy whether it be urban or rural. It is because there are many demands on the aquatic environment that careful planning is required to meet the aspirations of users and the Authority's aims. Catchment Management Planning is a consultative process for identifying existing and proposed water uses and the plan which results will help ensure that action is taken and co-ordinated. It is recognised that consultation on CMPs should not cut across the DoE's responsibility for consulting on statutory Water Quality Objectives.
- 3.6 The NRA Management Committee considered that CMP should be progressed in a co-ordinated way within the NRA. This report has been drawn up by a Group set up for the purpose consisting of a Regional General Manager and Senior Managers from several Regions and Head Office.
- 3.7 The aim of the Group has been to reach a consensus on a form of catchment planning which is widely acceptable and seen by the majority within the NRA as useful. Those Regions not represented upon the Group have been kept in contact with the work as it has

progressed. Also, the Technical Director, Chief Scientist and Director of Corporate Affairs and their Staffs have been kept in touch. It is accepted that this report will require wide consultation within the NRA including Regional Committees before a major commitment is made. However, the Group believe that properly controlled pilot work should proceed in parallel.

3.8 CMPs by their nature touch every corner of NRA activity. They have been referred to as building blocks of corporate strategy, but caution is necessary because of the resources their preparation consume. However, the link between the Functional Strategies and CMPs is cardinal, for the CMP represents the application in the catchment of all of the Functional Strategies.

3.9 The Group see CMP as a proactive process. It is a well known truth that where those with vision tread others will follow. So it is with plans. The CMP can be viewed as the NRA's vision of a catchment, a vision which may not be achieved for some years but once stated explicitly for all to see stands a strong chance of influencing the future.

3.10 This report addresses the main items of the Terms of Reference which were set out for the Group at the beginning. The report, prefaced by an Executive Summary, reviews current practice in the NRA and elsewhere, discusses fundamental issues of CMP, recommends a policy framework and outlines the form of implementation and the resources needed. Guidelines have been drawn up to enable Regions to develop plans in a structured way, indicating when and how consultation should take place with external organisations. Several Regions are preparing pilot CMPs at present so worked examples will be available when the report is discussed.

3.11 Acknowledgement

The Group wish to record the help and encouragement of many who have contributed towards the report and the thinking behind it.

1. Review current practice, experience and benefits of CMP in NRA.
2. Determine and recommend a comprehensive framework and guidelines for CMPs.
3. Assess the implications of adopting CMP approach more widely in terms of resources.
4. Draw up examples of CMPs.
5. Report findings to CPPG and Management Committee.
6. Consult externally, including Regional Committees and possibly a national conference.

SECTION 5**CATCHMENT MANAGEMENT PLANS GROUP**

Members**Designation**

Grainger Davies	Southern	Chairman	Regional General Manager
Alun Gee	Welsh	Secretary	Regional Planning Manager
Paul Foster	Anglian		Planning and Management Services Manager
Tony Stanley	Severn-Trent		Principal, Pollution Control
John Dickinson	Thames		Technical Services Manager
Jerry Sherriff	Head Office		Water Resources Manager
Howard Pearce	Head Office		Corporate Planning Co-ordinator

Regional Contacts

Rob Robinson	Wessex	Planning Co-ordinator
Deryck Major	North West	Technical Manager, Strategy and Services
Gerard Morris	Yorkshire	Environmental Scientist
Malcolm Newton	South West	Catchment Planner
Howard Taylor	Northumbria	Principal Quality Officer

Other Inputs

Nick Cartwright	Water Research Centre
Andrew Haig	Clyde River Purification Board
George Alexander	Department of the Environment, Northern Ireland

6.1 ENGLAND AND WALES (NATIONAL RIVERS AUTHORITY)

6.1.1 Introduction

Planning improvements and remedial measures in catchments is not a new concept in the NRA. Indeed, every Region has inherited or adopted procedures which allow problems to be addressed and solutions proposed. There is, however no standardised procedure, methodology or nomenclature for the process. It is likely that in most Regions, planning procedures have evolved to meet particular operational needs and, because of organisational arrangements, these tend to be unifunctional. Operational imperatives have also dictated that some plans be drawn up for large geographical areas such as whole Regions, possibly for a single Function, rather than on a catchment basis.

In contrast, the concept of a Catchment Management Plan is radically different, as described fully in Section 7. Certain Regions and their predecessors have considered how they might be approached. For some, this has meant pilot plan preparation whereas others are waiting for a policy to be devised and national guidelines prepared. Given the likely disparity of planning practices, it is instructive to determine and summarise the present position. To this effect, a questionnaire was sent out to each Region from which the following summary has been prepared.

It should be noted that the CMP experience of Regions producing pilot plans will have increased appreciably during recent months with the result that perceptions may also have changed.

6.1.2 The process of catchment planning in Regions

The position at the time of canvassing (October 1990) is summarised in Table 1, with responses to the questionnaire summarised in Table 2.

6.1.2.1 Current practice

In only two Regions, Welsh and Wessex, is there practised what can be described as multi-functional catchment management planning, although the level of activity is low (Table 1). Other Regions, are, however, at various stages of preparing to do so. For example, Anglian are undertaking a pilot study on the River Cam, South West are drawing up a plan for the Torridge, Southern have started on several catchments whilst Yorkshire are awaiting national guidelines.

In answer to the question about general catchment planning, all Regions indicated that they do or propose to undertake some form of catchment planning.

6.1.2.2 Multi-functionality

Catchment Management Planning is necessarily multi-functional. It involves more than bringing Functions together but is rather a process requiring co-ordination of all Functions. As well as those which are currently or about to undertake Catchment Management Planning, most Regions have had to address the question of how to resolve conflicts between Functions. In the absence of a CMP approach, special arrangements are possible. For example, in Anglian and Severn-Trent Regions the Water Quality Function consults other Functions when setting Water Quality Objectives; Anglian and Welsh Regions use multi-functional teams in preparing environmental impact assessments and when setting flow limits in water resource planning; Wessex refer conflicts to the Regional Management Group or Regional Advisory Board. In many instances, however, resolution of such conflicts is done in an ad hoc manner.

6.1.2.3 Co-ordination

At present, three Regions, Thames, Welsh and Wessex, have multifunctional planning departments from which CMPs could be co-ordinated. Yorkshire Region resolves interfunctional conflicts arising during the production of separate Functional plans by setting up joint working groups, consulting and liaising. The other Regions prepare plans within a single Functional Department with various degrees of input from others. For example, in Anglian Region there is a good working relationship between Flood Defence and Conservation Functions but the co-ordination is not independent of either of these. In Southern, it has been necessary to form a multidisciplinary group to get the subject off the ground.

The following summarises the Departments which currently take the lead in catchment planning in each of the Regions:

Anglian	Management Services
Northumbria	Water Quality
North West	Each Department independently
Severn-Trent	Each Department independently
Southern	Flood Defence
South West	Environmental Protection
Thames	Technical Services
Welsh	Regional Planning
Wessex	Catchment Planning
Yorkshire	Environment.

6.1.2.4 Reactive or Proactive

Whereas catchment planning needs to address current as well as future problems and is therefore partly reactive in nature, Regions are strongly of the opinion that CMPs should be viewed as proactive documents.

6.1.2.5 Definition of a catchment

Some Regions like Welsh, Southern and South West have many, small and geographically easily defined catchments. In contrast, Severn-Trent, Anglian and Thames have hydrometric catchments which are individually too large for CMP purposes. The issue of groundwater "catchments" also causes concern.

The definition given in Section 7 suggests a way forward. Whatever the definition, questionnaire returns make it clear that consideration of the interaction between catchments is essential, for example, between sub-catchments of large river systems, between adjacent catchments subject to intercatchment water transfer and between surface and groundwater catchments.

6.1.3 The benefits and disbenefits of Catchment Management Plans

Table 1 summarises the principal benefits and disbenefits of CMPs reported by the Regions. In general, it may be concluded from the questionnaire returns that Regions recognise the advantages of the CMP approach. These include improved internal co-ordination; the NRA is seen to operate openly with its objectives more easily understood by outside bodies, thereby assisting in negotiation with these to achieve environmental improvements; they help focus the NRA's efforts on active management of catchments, showing that the NRA is in control. Regions are also aware of the disadvantages, being most concerned about the cost, especially if CMPs are to be produced for many catchments and updated periodically. Regions are concerned that they should not replace all other forms of planning and negotiation in that there will remain, at least in the medium term, a need to progress some strategies on a national and Regional basis.

**TABLE 1 CATCHMENT MANAGEMENT PLANNING IN THE NRA REGIONS
- RESPONSES TO QUESTIONNAIRE**

QUESTION	R E G I O N									
	A	N	NW	ST	S	SW	T	W	WX	Y
1. Are catchment management plans currently prepared by the Region	✓	-	-	-	-	✓	✓	✓	✓	-
2. Is any form of catchment planning done or proposed	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3. Is there a formal mechanism for resolving conflicts	✓	-	-	✓	-	✓	✓	✓	✓	-
4. How is catchment defined										
- hydrometric boundary	✓	✓	✓	✓	✓	✓	-	✓	✓	✓
- sub catchment	✓	✓	✓	✓	✓	-	✓	✓	-	✓
- aquifer	-	✓	-	✓	✓	-	-	✓	✓	✓
5. Are catchment plans - reactive or proactive										
- reactive	-	-	-	-	-	✓	-	✓	✓	-
- proactive	✓	-	✓	✓	✓	✓	✓	✓	✓	✓
6. Are these - unifunctional or multi-functional										
- unifunctional	✓	-	✓	✓	-	-	-	-	-	✓
- multi-functional	-	-	-	-	✓	✓	✓	✓	✓	-
7. If multifunctional, which functions	FD				ALL	WQ	FD	ALL	ALL	
	C					F	C			
how co-ordinated										
- centrally	-	-	-	-	-	-	-	✓	✓	-
- by one function	✓	-	-	-	-	✓	✓	-	-	-
- Joint Working Group	-	-	-	-	✓	-	-	-	-	-
8. What are benefits										
- active management	✓	✓	✓		✓	✓		✓		✓
- external liaison	✓		✓		✓			✓		✓
- multi-functional		✓	✓	✓	✓			✓	✓	
- target resources			✓					✓		✓
- solve problems/conflicts								✓		
disbenefits										
- not Regional	✓		✓							
- resources	✓	✓	✓		✓	✓		✓	✓	✓
- not congruent with local authority boundaries	✓									
- time	✓		✓		✓	✓		✓		✓
- standardisation				✓						

TABLE 2

REGION	PRACTICE
ANGLIAN	The Region is far advanced in the formal setting of River Quality Objectives which take into account needs of users. Water Resources and Flood Defence Strategies consider water quality and conservation interests through multidisciplinary steering groups. Catchments are not dealt with separately. A pilot CMP is currently being prepared for the River Cam.
NORTHUMBRIAN	The Region has no formal system of catchment planning but has identified a resource requirement within the Water Quality Department for this purpose. Conflicts between Functions are resolved through consultation.
NORTH WEST	Individual Functions produce ad hoc internal documents for separate catchments. Water Quality plans for individual catchments are produced for discussion primarily with NWW plc after consultation with Fisheries and Water Resources Functions.
SEVERN-TRENT	Multi-functional plans are not routinely prepared, but critical issues have been addressed by multidisciplinary groups and reported on an ad hoc basis. Each Function has also identified critical river reaches on which significant change is sought and a clear summary of their objectives produced.
SOUTHERN	Although comprehensive catchment studies have been produced to date for Water Resources only, detailed preparation has been made for the production of full multidisciplinary catchment management plans. Initially six catchments, including aquifers will be planned using consultants.
SOUTH WEST	Planning has historically been carried out using project groups led by a primary Function. Recently, CMPs (Phase 1) have been prepared multifunctionally (but principally by Fisheries and Water Quality) for the Rivers Taw, Torridge and Teign, with separate plans for their estuaries.
THAMES	Detailed guidelines and a framework for river catchment plans have been produced initially for the purposes of flood defence and land drainage. It is intended to expand the scope of these eventually to cover other functions.
WELSH	Multidisciplinary catchment management plans are being produced, with three (Phase 1) plans in preparation at this time. These are co-ordinated by a central multidisciplinary planning team who also prepare Regional strategies for dealing with issues such as sewage works discharges, storm water overflows, bathing waters, deemed consents, Red List substances and water abstractions.
WESSEX	Historically unfunctional catchment plans have been produced but not presented formally. A Catchment Planning Department now exists to produce multidisciplinary management plans and work has begun on a pilot study on the Moors River.
YORKSHIRE	Formal catchment plans have been produced separately for Environment (Water Quality) and Water Resources Functions involving joint working groups and consultation and liaison with other functions as thought appropriate. It is intended to produce multifunctional catchment management plans co-ordinated by the Environment Department as soon as national guidelines are agreed.

In Scotland, the seven River Purification Boards (RPBs) are the pollution control and hydrometric authorities, except in the Isles where responsibilities are invested in the Islands Council. The RPBs' remit does not include abstraction (except for spray irrigation), land drainage, flood defence, fisheries, recreation or navigation. These functions are performed by various bodies including Regional Councils, Fishery Boards and Port Authorities.

As a consequence of their limited remit, the RPBs' management plans have tended to be relatively simple structures, often prepared in response to a particular development. At present, consultation with interested parties on various issues is done either through membership of the RPBs (on water quality issues) or by liaison with other authorities such as Regional Councils, District or Regional Planning Authorities, Department of Agriculture and Fisheries for Scotland and the Nature Conservancy Council. Formal catchment-based multifunctional planning of water related activities is not carried out. However, at least one RPB is moving in this direction with the appointment of a Planning Liaison Officer to perform a co-ordinating role in catchment planning and produce a description or overview of each catchment area.

6.2

NORTHERN IRELAND (DEPARTMENT OF THE ENVIRONMENT)

Responsibility for the water environment in Northern Ireland is vested in a number of organisations. Whilst the DoE (NI) is, amongst other things, responsible for the provision of water, environmental protection, conservation and planning, the Department of Agriculture has responsibility for fisheries, inland navigation and flood defence. In addition, there are two semi-independent fishery bodies: The Foyle Fisheries Commission and the Fisheries Conservancy Board. Management of catchments, therefore, depends on complex liaison arrangements between these various public bodies.

Under the Water Act (NI) (1972), the Departments of the Environment and Agriculture may prepare water management programmes with respect to water resources. These are statutory programmes which, after public consultation, must be laid before Parliament at both draft and final stages. To date, no such programmes have been made. However, DoE (NI), in conjunction with DoE (ROI), are at present jointly seeking funding under the EC Interreg Programme, for Integrated Water Quality Management Plans for the Erne and Foyle catchment areas.

6.3

EUROPE

6.3.1

Introduction

This section summarises a report on multi-functional catchment management planning in Europe written for the NRA by the Water Research Centre. The report is restricted to the situation in four countries which are the most likely to have instituted some form of catchment management: France, The Federal Republic of Germany, Italy and The Netherlands. The role of International Commission in planning improvements in the major European rivers is also examined.

6.3.2 The Netherlands

Policy and management plans are widely used in the Netherlands but often do not relate to river catchments. Water management is presently being reorganised to integrate quality and quantity functions on a catchment basis, but there is some resistance and changes may only be gradual.

6.3.3 West Germany

River management plans have only been produced for five small rivers in West Germany and a few additional plans are being produced, the most important being for the upper Main river. The low priority given to these plans is due to the emphasis being placed in Germany on the control of point sources to improve water quality.

6.3.4 France

In France the proportion of rivers for which quality objectives have been established varies between Agencies and in some cases may have been produced only for the larger rivers. All Agences Financière de Bassin (normally referred to as Agences de l'Eau), however, produce five year plans to allocate funding with respect to their priorities for improving water quality.

6.3.5 Italy

Few regions in Italy have produced water improvement plans and implementation of the plans has in most cases not been carried out because of lack of resources. However, one of the tasks of the newly formed catchment water authorities is to draw up water management plans.

6.3.6 Conclusions

The river catchment management approach is difficult to apply in the countries examined in the report because major European rivers such as the Rhine, Moselle and Danube flow through several countries and are not therefore under the control of a single country. International Commissions have been set up to co-ordinate the management of some international rivers, but these are mainly concerned with water quality. Even smaller rivers are often not controlled by one authority because river management is frequently the responsibility of provinces or States which are not organised along catchment areas. Management of non-State waters in the Netherlands is further complicated because different water boards may be responsible for water quality and quantity functions. Only France organises water management on a catchment basis, however, there often appears to be a conflict of interest between the Agences de l'Eau and local authorities in terms of priorities. Water management plans are mainly concerned with water quality and are used by the Agences to plan investment for water quality improvement.

It may be concluded that the NRA is in an unique and advantageous position in Europe to develop multifunctional management plans. Unlike in other countries, in England and Wales the organisation and blend of functional responsibilities of the NRA facilitates integrated planning on a catchment basis.

7.1 Introduction

Catchment Management Planning, like any new procedure, requires definition of terms and scope at an early stage if discussion is to be meaningful. The present section considers what is meant by a catchment, by catchment management planning, the benefits and disadvantages as well as the relationships with corporate planning and the setting of statutory Water Quality Objectives. It is the result of extensive discussion within the CMP Group and between it and the Regions and Head Office Directorates.

7.2 Definition of Catchment Management Planning

Catchment Management Plans will state the current situation for all water related activities in a catchment with proposed actions for their future development and the resolution of any problems over at least a ten year period. The proposals for action will endeavour to resolve conflict between the various uses and users of the water environment. At the very least, CMPs will identify conflicts and propose options for resolving them. The plans will help manage the activities of the NRA internally and they will act as a vehicle for the communication of our intended actions to outside bodies and the general public.

7.3 Definition of a Catchment

For the purpose of CMP, a catchment is defined as a discrete geographical unit with boundaries derived primarily from surface water considerations and comprising one or more hydrometric sub-catchments. Groundwater will be treated on the basis of inputs to and exports from the surface water catchment.

The catchment will include the appropriate inland river system, associated groundwater and estuarine waters, the exact boundaries of which should be defined in the CMP report. Information on sea defences and coastal water quality should be included where necessary. Where there are separate coastal strategies, abstracts of these will need to be included in the appropriate catchment plan.

The size of the catchment must be sufficient to adequately deal with uses and problems. In the first instance a very broad range of between 500 and 5,000 km² is recommended. This suggests that there may be more than 150 catchments in England and Wales. (see Appendix 2). Once a number of plans are developed this range may need to be revised.

7.4 Content, Purpose, Benefits and Disadvantages

7.4.1 Content

A typical CMP should address the following broad topics:-

- a) An overview of the physical characteristics of the catchment.
- b) A statement of objectives and targets for each water use within the catchment.
- c) A statement of the current situation for all water uses in the catchment, with associated NRA policies, the controls that exist on the water environment and the likely development in the catchment.
- d) The identification of potential problems, conflicts, and deficiencies for users and beneficiaries.
- e) A statement of proposed changes to catchment use. This will be the vision of the catchment as the NRA perceives it.
- f) Future action programme to manage the catchment, including key activities and tasks for the NRA and other users and beneficiaries. The action plan will allocate responsibility for action and will provide an investment framework for all bodies involved. Commercial confidentiality will be preserved by publishing costs only as far as third parties allow.

7.4.2 Purpose

The plan should have the following purposes within and outside the organisation:-

INTERNALLY - To positively manage the catchment.

- To act as a basis for operational strategies for all functions to ensure a co-ordinated approach.
- To secure and prioritise future resources.
- To act as a vehicle for the NRA to receive Regional Committee advice.

EXTERNALLY - As a vehicle to communicate NRA plans to outside bodies and the public and as a vehicle for resolving conflicts in relation to use.

- To ensure that the NRA takes account of the actions of others.
- To influence decision making and improvement of the water environment.
- To ensure that the programmes for action by NRA and others, e.g. to achieve Water Quality Objectives, are defined and targetted.

7.4.3 Benefits

The benefits of Catchment Management Planning include:-

- Better organisation and prioritisation of NRA activities through active management of catchment; it is a management tool to facilitate better prioritisation and allocation of resources.
- Better inter-functional co-operation for the corporate benefit of the NRA.
- Better communication with outside bodies.
- The use of a recognised vehicle for consultation with others.
- The resolution of conflicts in an open way.
- Improved response to the public with a faster response to technical queries, a clear definition of NRA objectives, and the provision of consistent standards of service.

7.4.4 Disadvantages

The disadvantages of Catchment Management Planning include:-

- The process is time consuming and uses valuable staff resources.
- Plans themselves will take a considerable elapsed time to prepare, consult on and publish. There is an inevitable overlap with ongoing business.
- They will become out-dated and will take time to update.
- They may duplicate some other plans.
- Many outside bodies do not work or manage on a catchment basis.

7.5 Relationship with the Corporate Planning Process

It is tempting to regard Catchment Management Plans as the building blocks for Regional plans, in the same way that Regional and H.O. plans form the building blocks for the national Corporate Plan. Such an approach may appear unrealistic at the present time, since it implies that plans must be prepared for all catchments. However, not all catchments need to be planned in detail before individual catchment considerations and resource needs could be fed into Regional Plans.

An alternative practical approach is suggested:-

- Functional Strategies acknowledge the intrinsic logic of adopting a CMP approach within each Function.
- Regional Plans are constructed based on priorities arising from the individual Functional Strategies.
- Catchment Management Plans are developed for individual catchments on a priority basis.

Such an approach will target efforts to high priority areas and in time will lead to wider CMP coverage. It will also allow the NRA to adapt at a realistic pace to a new working philosophy.

7.6 Relationship with Statutory Water Quality Objectives

The Water Act 1989 authorises the Secretary of State to make regulations prescribing a system of classifying the quality of all controlled waters. The Secretary of State may also serve notice on the NRA establishing water quality objectives under this water quality classification system. At present, the NRA is advising the DoE on its proposals for a classification scheme which incorporates target classes, use-related quality objectives and EC Directive requirements. It is likely that the NRA scheme will be adopted as a basis for statutory Water Quality Objectives and introduced for rivers in 1992. Objectives for other controlled waters may be phased in during the following 3-4 years. Five years after their introduction, the water quality objectives may be reviewed by the Secretary of State or, alternatively, the NRA may instigate a review. Specific public consultation arrangements for setting and altering the Objectives are required under the Act.

Catchment Management Planning and the setting of statutory Water Quality Objectives have much in common. They both involve setting use-related objectives for specified waters through a process of public consultation and agreement. However, whilst the latter have a smaller scope, applying only to water quality criteria, they do have statutory force and clearly have priority. Given the DoE's predetermined timetable, it will not be possible to use CMPs for setting statutory WQOs. However, sustained environmental improvements in catchments will necessarily involve effective planning and public support. Catchment Management Planning provides a vehicle for doing this and is therefore likely to be of particular advantage to the NRA when the opportunity comes to seek revision of early WQOs. Under the currently proposed WQO scheme, statutory objectives will not be set for tidal waters until 1995/96, by which time many fully-consulted CMPs could be in place.

7.7 Other Statutory Objectives and NRA Standards of Service

The preparation of catchment management plans can also be used as a vehicle for recommending and consulting about other statutory objectives (e.g. minimum acceptable flows) and standards of service (e.g. Flood Defence standards) where appropriate.

8.1 Introduction

The main challenge to the CMP approach is the heavy demands on resources, principally the time and pressure on key staff. However, if a proactive approach is taken and the workload is programmed by priority then a smooth change to the new philosophy can occur. Indeed the staff involved will benefit by being provided with a clear sense of direction and active participation in decision making. In the longer term the publication of the NRA's plans and policies in a catchment will reduce the number of current fire fighting responses which are made to planning, enquiries and applications. Moreover, CMPs will help the public see the NRA as one organisation, not as a mere collection of sectional interests.

8.2 Catchment Priority

As with any new and standardised methodology, the introduction of CMP should be done carefully and with consideration. In the early years, lessons should be learned during CMP preparation to fine-tune the process to meet the NRA's needs. A reasonable target would therefore be for each Region to produce at least one CMP in 1991/92. This will help in the development of new ideas, enable Regions to gain experience and initiate public consultation. The number of catchments considered could then be increased steadily in line with available resources. As indicated in Section 6 and listed in Appendix 3, some Regions have already started to produce CMPs, unifunctional plans and 'Fact Sheets'.

Catchments should be selected for the application of CMPs on the basis of known important conflicts of interest, technical problems and political considerations. Where these issues are not easily determined, Regions should apply a simple scoring system as given in Table 3.

8.3 Production

There are several distinct steps in the production of a Catchment Management Plan. Detailed Guidelines have been prepared (Appendix 4) to assist Regions produce Plans in a consistent way throughout the Authority.

The approach recommended consists of

- (a) identifying current and future uses (e.g. salmonid fishery, potable water abstraction, flood water storage, navigation);
- (b) specifying objectives and standards required to sustain the uses;
- (c) identifying the current status of the catchment in relation to these standards;
- (d) identifying problems and then setting priorities and options for overcoming them.

A draft CMP report is prepared outlining the proposed plan of action. This acts as a basis for wide consultation aimed at reaching an acceptable and practical programme of environmental improvements.

Table 3

Scoring matrix for prioritising catchments for catchment management planning

Activity in Catchment	Water Quality	Flood Defence	Water Resources	Fisheries Recreation, Conservation & Navigation
Conflict between Uses and Users				
Achievement of Standards of Service (Objectives)				
Achievement of NRA's Performance Indicators				
Number of Planning Applications of interest to NRA				
Number of Applications for NRA's Services				
Public Awareness				
TOTAL				

Score 1-5 - the higher the number the greater the priority.

8.4 Management

As a multi-disciplinary product, CMPs require input from each Function which can be best achieved by a multi-disciplinary group chaired by a senior manager who may come from any Department.

Whereas workload consideration may preclude the active participation of Regional Management Group members, the successful implementation of catchment management planning depends on the full support of managers at the highest level throughout the Authority. The main workload will need to be handled by a Catchment Planning Co-ordinator who will be engaged full-time. The need for additional resources will vary from Region to Region.

In order to make the complex process work, a strong commitment and adequate resources are the keys to success. Moreover, the active support of a variety of levels of Function staff is essential. In addition, the staff need to recognise that the plan production is a worthwhile exercise and not a bureaucratic impingement on their "real work".

In this report, the Guidelines and resource requirements are based on the current organisational structure. One of the reasons why the process of catchment planning is considered resource intensive may be that many individual managers currently do not have multi-purpose responsibility for their own catchments. The production of CMPs is therefore not seen as a normal part of a manager's work. If the NRA was organised on a catchment basis, however, multi-purpose Catchment Managers would use their own line managed Function staff to produce these plans. This is clearly an issue beyond the scope and remit of this report, but something which needs to be addressed elsewhere.

8.5 Level of Detail and Hierarchy of Reports

Three levels of report are required:-

Level 1 - PR Summary. This will consist of 4/5 pages, including suitable maps, summarising in plain language the plan in relation to uses.

Level 2 - The Catchment Management Plan. This will summarise existing uses, identify problems and explore conflicts and make proposals for actions. It must be self contained, and well illustrated with line drawings, diagrams and synoptic maps.

Level 3 - Support Documents. These will be Functional back-up reports which support the information presented in the Level 2 document. (Examples may include Functional maps showing key information on the watercourse, capital programmes, tables of licensed abstraction volumes, detailed technical reports etc.).

The presentation of all this information is critical and in the long term, it may be appropriate to make use of a GIS database as an operational tool to help the analysis and presentation of the data.

8.6 Audience and Consultation

8.6.1 Audiences

Level 1 - The PR Summary will be widely circulated to the general public.

Level 2 - The Catchment Management Plans will be circulated to NRA staff, consultees and committees.

Level 3 - Support Documents. These will be mainly drawn up and used primarily by NRA staff. They may prove useful to outside specialist organisations and could be issued to such groups on request. They should not be confidential as they may have to be presented to justify the NRA's position.

8.6.2 Consultation

The primary need for liaison and consultation during the preparation of the CMP is to endeavour to obtain consensus both internally and externally and to fairly resolve conflicts of use in a public forum. The NRA will consult those organisations which are affected by the plans. The following, non-exhaustive list gives an indication of likely consultees:-

Local and County Councils	National Farmers Union
Sewerage and water undertakers	Farming Union of Wales
Riparian owners	Countryside Council
Local residents associations	National Trust
MAFF/ADAS	English Heritage
IDB's	Angling Clubs
HMIP	British Waterways Board
Harbour Authorities	Navigation Authorities
Forestry Commission	RSPB
CLA	NRA Regional Committees
Major industry in the catchment	CBI
Welsh Development Agency	Action Groups
Sports Council	British Canoe Union
General public in the locality	

The consultation will follow the process used for local and structure plans whereby initial draft plans are submitted to consultees and discussed with them, revisions made and then a further draft is discussed at a public meeting. The final plan is published taking account of consultees' suggestions whenever possible but recognising that the NRA has final responsibility. Regional Advisory Committees will be consulted both before and after other consultees.

Whereas few CMPs will have been produced when the Secretary of State for the Environment sets statutory Water Quality Objectives in 1992, the adoption of the CMP approach will greatly assist the NRA in seeking revisions to these in 1997 and beyond.

9.1 Introduction

This section endeavours to quantify the resource impact on the organisation of adopting the development of catchment plans. The resources estimated are those needed for the production of the plans. The cost of implementing them will clearly depend on the needs of each catchment. It concludes with some recommendations to take forward the process in a practical way.

9.2 Resource Estimates

9.2.1 The preparation of Catchment Management Plans will require a significant resource input at various levels in the organisation. As a minimum these can be summarised as:-

- | | |
|-------------------------------|--|
| OPERATION INPUT | - Each Function will be required to collate basic information for the catchment and to contribute to the overall development of the plans. |
| PLANNING/CO-ORDINATING INPUT | - This will involve the co-ordination of the process and the development of options, priorities and final plans. |
| MANAGEMENT INPUT | - To manage and oversee the whole process.
- To confirm the policy line adopted. |
| CLERICAL/ADMINISTRATIVE INPUT | - To support the whole process and in particular to help with the final preparation of synoptic maps etc. |

9.2.2 It is difficult to quantify the precise resource need as this clearly will depend on the size of a catchment, the complexity and of its uses, the availability of basic data and the need for any special investigative work. However, some Regions have carried out pilot catchment plans and the their resource estimates are:-

	AREA (km ²)	MAN DAYS
Anglian	1,100	110
Southern	750	110
South West	857	350
Welsh	530	291

9.2.3 The resources required will vary according to the availability of data from each catchment and the establishment of the framework for Catchment Management Planning in each Region. Within these resource estimates the need for co-ordinating resources is clearly separated from the need for operational input. The co-ordinating role appears to consume some 35-50% of the total resource and will typically fall to one person. The operational input is spread across seven Functions and represents a relatively small number of

days effort. It is nevertheless an additional burden on operational staff to which Management must have regard when allocating operational resources. It is therefore important that a permanent member of staff is identified to fulfil the co-ordinating role.

9.2.4 The role of GIS has been considered in relation to the provision of resources and Anglian Region's pilot study has directly involved the use of this facility. In its early stages and until all data can be directly accessed in a relevant database and automatically displayed against a geographic background, GIS is likely to be too resource intensive for catchment planning. However, as Southern Region have found, good computer graphics can aid the presentation of complex attribute data on a background map at modest cost.

9.2.5 The area covered by England and Wales is approximately 152,000km². On the basis of average catchment sizes of 1,000km² this will result in more than 150 catchment management plans being prepared. If an average figure of 150 man-days per plan is taken, this results in a very approximate estimate of total resources of 22,500 man-days or 100 man years of effort to complete catchment plans for the whole of the NRA's area of responsibility. This is a huge investment in time and effort and it reinforces the need to phase the development of catchment plans on a prioritised basis over a long period of time, perhaps 5 or 10 years.

9.3 Funding

9.3.1 Adopting this approach will directly cost the NRA some £2m with a further £2m of indirect costs. On this basis the estimated cost of preparing catchment plans for all catchments is therefore £4m. This could be phased over a number of years with the following consequences:

5 years	-	£800,000/year
10 years	-	£400,000/year

If this cost is not funded additionally, it will clearly be at the expense of existing activities.

9.3.2 The question that must be considered is "will the organisation gain £4m of benefit from catchment planning". This is difficult to quantify but over a 10 year period, total NRA expenditure will be some £4,000M. In addition, the NRA through its CMPs will influence the expenditure of a much greater sum of money on the environment by other organisations. £4m is only 0.1% of the NRA expenditure, to ensure that we communicate with others over our actions. This is considered to be a small price to pay.

9.3.3 Catchment Management Plans benefit all Functions and they receive contributions from all Functions. It is therefore assumed that they will be funded from all Functions on the basis of the proportions of total spending on plan production.

9.3.4 Costs should be assessed and collected by the Catchment Planning Co-ordinator in each Region, reflecting those costs which are incurred primarily for the CMP. The costs of the Functional input and co-ordination should be recorded separately, using man-days and average unit-costs.

To be effective, Catchment Management Plans need considerable resources, the development of plans should therefore be phased over a 5-10 year period. Whereas GIS has significant potential, it is likely to be too resource intensive for pilot plans. However, good computer graphics will aid the clear presentation of attribute data on a background map. It is recommended that each Region appoints a full-time co-ordinator to progress these plans and that managers have regard to the workload falling on operational staff when allocating resources. The costs of CMPs should be spread across all Functions in proportion to their expenditure on their production.

10.1 Introduction

10.1.1 The issues to be considered in Catchment Management Plans will not for the most part be new and will already be recognised although often within an essentially single Function framework.

10.1.2 In terms of R & D requirements, Catchment Management Plans in themselves should not be expected to generate a large number of new problems to solve. Adoption of Catchment Management Planning will however highlight certain areas for priority attention and focus on certain aspects which may need greater attention within existing or proposed projects.

10.2 Key areas for consideration

10.2.1 Four primary issues concerning R & D which need to be addressed can be identified, namely:-

- a) the development of use related criteria or standards relevant to each environmental requirement (water quality, water quantity and physical features).
- b) the need to ensure that projects addressing issues within any R & D Commission adequately reflect potential interactions with other Commissions (Functions).
- c) as the use of mathematical modelling develops within the NRA, that adequate attention is paid to developing an 'holistic' catchment approach, and
- d) the need to undertake some 'customer survey' investigations to more clearly identify the public's aspirations in terms of the water environment.

10.2.2 The availability of use related criteria and standards is important for assessing the status of catchments and the development of remedial programmes. Such standards are currently better developed for some Functions (e.g. Water Quality) than others (e.g. Water Resources). It should also be recognised that the development and refining of standards will inevitably be an on-going process requiring R & D effort.

10.2.3 Catchment Management Plans will emphasise cross Functional links and interactions and it is essential that all R & D activities are undertaken with such interactions in mind.

10.2.4 Catchment Management Plans will emphasise the desirability of developing an integrated modelling capability within the NRA which can accommodate multiprocess and cross Functional links. Such a requirement has already been identified within the concepts of 'catchment accountability' and 'catchment capacity' as recently promulgated by the Chief Scientist.

10.2.5 Consultation during the preparation of a Catchment Management Plan will inevitably be via authorities, organisations or groups with particular strong interests. There is a case for carrying out some type of consumer research designed to obtain an insight into the general public's perceptions, visions and requirements in terms of catchment management.

10.3 Existing situation

10.3.1 With the exception of that described in 10.2.5, most of the above areas are already recognised to some degree within the existing R & D Programme. In all Commissions, projects can be identified which appear to have relevance to the development of criteria or standards and many cross Functional links have been established. However the current programme has not been developed with Catchment Management Plans specifically in mind.

10.3.2 A review project (G1(91)4) dealing with Catchment Models has been identified within Commission G - General Operations.

10.4 R & D Proposals

If Catchment Management Planning is to be adopted, then there will be a strong case for R & D Commissioners to initiate a review of appropriate topic areas to consider if additional work on standards and criteria would be appropriate. Similarly, Project Leaders of relevant projects should be asked to undertake reviews to ensure that, wherever possible, outputs will be applicable within the Catchment Management Planning framework, and that adequate attention is paid to cross Function links.

10.4.2 Project Leaders for 1991/92 new starts should be specifically asked to consider any relevance to Catchment Management Plans and address this in their Project Investment Appraisals.

10.4.3 Proposals for a consumer survey to fulfil the requirements set out in 10.2.5 should be further developed and a proposal submitted.

10.5 Operational Investigations

It will be inevitable that Catchment Management Plans will identify the need for Operational Investigations which will be funded by the Region concerned.

- 11.1 A CMP will result from a multi-functional and multi-use appraisal of a catchment which:-
- takes account of Functional Strategies and objectives
 - identifies present and defines future:-
 - uses of water and associated land within the catchment
 - land use which influences the water environment
 - land drainage and flood defence activities
 - and sets appropriate standards for each, giving priority to statutory obligations.
 - identifies interaction and potential conflicts.
 - sets out an action plan to achieve the defined uses of water within the catchment, land use controls and land drainage and flood defence objectives.
 - the action plan will allocate responsibility for that action and will provide an investment framework. Commercial confidentiality will be preserved by publishing costs only as far as third parties allow.
- 11.2 Catchment Management Planning is not designed to replace the way in which catchments are being developed but rather to create a consistent framework within which the diverse responsibilities of the NRA can be applied within a catchment in a co-ordinated manner. Although intended to take account of the interests of all NRA Functions, the importance of CMPs to the Water Quality Function is notable because of the link with statutory Water Quality Objectives. Timetable consideration constrain the use of CMPs in setting WQOs in the early years, but are likely to be extremely useful when the latter are revised from 1997 onwards.
- 11.3 During preparation of a CMP the NRA will consult widely with external organisations including local authorities, sewerage and water undertakers, and other organisations with an interest in or likely to be affected by catchment development. Statutory Committees should be consulted first and later invited to consider the responses of other consultees and advise where differences have to be resolved.
- 11.4 Output from the development of a CMP will be a short summary for wide circulation to the general public and a longer more detailed but straightforward report (the Catchment Management Plan) for circulation to committees and appropriate external organisations. More detailed technical documents will be produced, largely for internal use.
- 11.5 The planning period over which the CMP is prepared will depend upon the issues and options which relate to the catchment in question but typically are envisaged to cover at least a 10 year horizon with the plan being reviewed every 5 years, with updating as necessary.

- 11.6 A catchment for CMP purposes will include both inland waters, groundwater interaction and tidal waters. The aerial extent will be dictated by the problems to be solved but "catchments" are expected to range from 500 to 5,000km².
- 11.7 CMPs will assist the Corporate Planning process but will not be sufficiently comprehensive in the medium term to comprise a common building block for such plans.
- 11.8 Priority will be given to catchments:-
- where significant conflict exists between users of the water within the catchment;
 - where present 'standards' are not being met;
 - where significant development is planned which could have a major impact on the water environment;
 - although some objective criteria are proposed for inter-catchment prioritisation, statutory requirements will override other considerations.
- 11.9 For effective implementation, plans should be produced to standard guidelines recommended in the report. The guidelines consist of a number of discrete steps as follows:-
1. Set up a multi-functional catchment planning group.
 2. Identify current and future uses.
 3. Identify the objectives and standards for these catchment uses.
 4. Identify the current status of the catchment.
 5. Identify catchment shortfalls, priorities and options for actions.
 6. Produce draft CMP.
 7. Consultation.
 8. Publish final CMP.
 9. Implement the plan.
 10. Monitor and update the plan.
- 11.10 Based on the current organisational structures, the introduction of a standard approach to catchment management planning will generate a significant workload in Regions which will require careful management to minimise disruption. The process will also require close monitoring to ensure that benefits are realised. The Group recommend that responsibility for the catchment management planning initiative in the Region should be assigned to a Senior Manager and that the co-ordination of the multi-functional CMP groups should be undertaken by a full-time Catchment Planning Co-ordinator.

- 11.11 To monitor the implementation of these recommendations, special cost centres should be set up in each Region. Funding should be spread across all Functions in proportion to their expenditure on the production of the Plan. Regular progress reports should be made to Regional Management and Head Office.
- 11.12 The multi-functional Catchment Planning Group is a vital ingredient for success. The leader should be selected for his management skills and the members should include staff responsible for the operational management of the catchment in question.
- 11.13 The research and development requirements of CMPs have yet to be fully determined. In the early period, emphasis should be placed on establishing suitable standards in support of catchment uses. The NRA's need to better understand the relationships between different activities in catchments and to predict the consequences and costs of alternative remedial options will require further development of mathematical models.
- 11.14 The Group recommends that pilot studies of priority catchments in every Region should be commenced as soon as possible according to needs and resources, with at least one CMP being produced annually by each Region. There should be a national review in 1992 following completion of the first plans to ensure that experience is used to guide improvements. Depending on experience during this trial period, CMPs should eventually be produced for all catchments in England and Wales.
- 11.15 It is accepted that this report will require wide consultation within the NRA including Regional Committees before a major commitment is made. However, the Group believe that properly controlled pilot work should proceed in parallel.

APPENDIX 1

QUESTIONNAIRE TO NRA REGIONS
ON CURRENT CMP PRACTICE

NRA CATCHMENT MANAGEMENT PLANS GROUP

CURRENT PRACTICE & APPROACH IN NRA REGIONS

REGION : _____

1. Are Catchment Management Plans currently prepared by the Region?
2. Is any form of catchment planning currently undertaken or being proposed by the Region?
3. How else do you resolve conflicts between Functions?
4. If yes to questions 1 or 2, how is a catchment defined for the purpose of the planning exercise?
5. Are catchment plans used:-
 - ...to collate existing solutions, ie are they reactive?
 - or ...as a means of solving problems, ie are they proactive?
6. Are catchment plans carried out:-
 - ...unifunctionally?
 - or ...multi-functionally?
7. If catchment plans are carried out multi-functionally:-
 - ...which functions are involved?
 - ...how is the exercise coordinated?
8. Even if catchment plans are not carried out:-
 - ...what benefits are they considered to provide?
 - ...is it felt that there are any disbenefits to the organisation?
9. If catchment plans have been carried out, please submit copies of representative plans to the Group.

APPENDIX 2

PRINCIPAL RIVER CATCHMENTS IN ENGLAND
AND WALES LISTED ACCORDING TO
NRA REGIONS AND THEIR SUBDIVISIONS

REGION	AREAS	DIVISIONS	DISTRICTS	CATCHMENTS
NORTHUMBRIA	Northern			R. Tweed R. Aln R. Coquet R. Wansbeck R. Blyth R. Tyne R. Wear R. Tees
	Southern			
Totals	2	0	0	8
YORKSHIRE	Northern			R. Derwent/Esk R. Hull & tidal Ouse/Humber
	Central			R. Aire/Calder
	Southern			R. Ouse/Wharfe & tribs. R. Don
Totals	3	0	0	5
NORTH WEST	North - North Cumbria			R. Eden & Estuary R. Derwent/Esk
	- South Cumbria			R. Leven & Morecombe Bay R. Lune
	Central			R. Wyre R. Ribble R. Douglas
	South			R. Mersey & Estuary R. Weaver R. Irwell
Totals	3	0	0	10
SEVERN TRENT	Upper Trent			Trent u/s Stafford Minor Tributaries Trent Stafford to Burton R. Dove R. Tame R. Blythe R. Sowe
				Trent Burton to Nottingham R. Soar R. Derwent Minor Tributaries
				Trent Nottingham to tidal Minor Tributaries
				R. Maun/Idle R. Leam R. Erewash Tidal Trent
				Lower Trent Tributaries
	Upper Severn			Severn u/s Vyrnwy Plus Tributaries Severn Vyrnwy to Worcester R. Teme R. Stour R. Tern
				Minor Tributaries
				Severn Worcester to Gloucester R. Leadon R. Avon Minor Tributaries
	Lower Severn			
Totals	4	0	0	29

NATIONAL RIVERS AUTHORITY -

REGIONS, AREAS, DIVISIONS, DISTRICTS & CATCHMENTS

REGION	AREAS	DIVISIONS	DISTRICTS	CATCHMENTS
WELSH		Northern		R. Dyfi R. Dysynni R. Mawddach R. Glaslyn R. Dwyfor R. Erch R. Gwyrfa R. Seiont R. Ogwen R. Conwy R. Clwyd R. Dee R. Braint R. Cefni
		South Eastern		R. Wye R. Usk R. Rhymney R. Taff R. Ely R. Cadoxton
		South Western		R. Thaw R. Ogmore R. Kenfig R. Afan R. Neath R. Tawe R. Loughor R. Tywi R. Taf R. Pembroke R. E. Cleddau R. W. Cleddau R. Nevern R. Teifi R. Aeron R. Ystwyth R. Rheidol
Totals	0	3	0	37
ANGLIAN	Northern		Manby	R. Ancholme/Rase East Halton Beck/Freshney Waith Beck/Louth Canal/Steeping
			Lincoln	Upper Witham/Till Lower Witham/South Forty Foot
			Kettering Kettering/Spalding	Upper Welland/Chater Upper Nene Lower Welland/Glen
	Central		Spalding	Lower Nene
			Bedford	Ouse/Ouzel Bedford Ouse/Hiz
			Ely	Old Bedford/Old Nene Cam/Rhee
	Eastern		Norwich	Ely Ouse/Little Ouse Bure/Stiffkey/Glaven Bure/Ant Tare/Wensum
			Norwich/Ipswich	Waveney
			Ipswich	Blyth/Alde/Deben
			Ipswich/Kelvedon	Gipping/Stour Colne/Blackwater Chelmer/Crouch
			Chelmsford	
Totals	3	0	11	22

REGION	AREAS	DIVISIONS	DISTRICTS	CATCHMENTS
THAMES	Upper Thames			Upper Thames
	Thames - Main			Thames - Main
				Mid Thames
				R. Kennett
				R. Loddon
				R. Wey
				R. Mole
				R. Colne
				London Rivers
				Lee & Essex Rivers
	Tidal Thames			Tidal Thames
Totals	3	0	0	11
SOUTHERN			Winchester	Isle of Wight
				R. Test
				R. Itchen
				R. Meon
			Chichester	R. Arun
				R. Adur
			Pevensey	R. Ouse
				R. Cuckmere
				Wailers Haven
				R. Rother (Eastern)
				R. Brede
				R. Tillingham
			Canterbury	R. Stour
			Tonbridge	R. Medway
				R. Darent
				R. Cray
Totals	0	0	5	16
WESSEX	Bristol Avon			Bristol Avon
				Bristol Frome
				Somerset Frome
				Little Avon
	Somerset			R. Tone
				R. Parrett
				R. Yeo
				Other North Somerset
				Other West Somerset
	Avon & Dorset			Hampshire Avon
				Dorset Stour
				R. Frome
				R. Piddle
				Other West Dorset
Totals	3	0	0	14
SOUTH WEST	East			R. Lim
				R. Axe
				R. Sid
				R. Otter
				R. Exe
				R. Teign
				R. Dart
				R. Avon
				R. Erme
				Abbey River & Clovelly Stream
				R. Torridge
				R. Taw
				North Devon Coastal Streams
				R. West Lyn/East Lyn

REGION	AREAS	DIVISIONS	DISTRICTS	CATCHMENTS
SOUTH WEST	West			R. Yealm R. Tamar R. Seaton Looe Rivers R. Fowey R. Par R. Crinnis St. Austell River R. Fal R. Cober South Cornwall Coastal Streams R. Hayle Red River R. Gannel R. Camel North Cornwall Coastal Streams R. Strat/Neot
Totals	2	0	0	31

GRAND TOTALS

REGIONS	AREAS	DIVISIONS	DISTRICTS	CATCHMENTS
10	23	3	16	183

REGION	AREAS	DIVISIONS	DISTRICTS	CATCHMENTS
SOUTH WEST	West			R. Yealm R. Tamar R. Seaton Looe Rivers R. Fowey R. Par R. Crinnis St. Austell River R. Fal R. Cober South Cornwall Coastal Streams R. Hayle Red River R. Gannel R. Camel North Cornwall Coastal Streams R. Strat/Neot
Totals	2	0	0	31

GRAND TOTALS

REGIONS	AREAS	DIVISIONS	DISTRICTS	CATCHMENTS
10	23	3	16	183

REGIONAL ORGANISATION - SUMMARY

REGION	Areas	Divisions	Districts	Catchment
Northumbria	2	0	0	8
Yorkshire	3	0	0	5
North West	3	0	0	10
Welsh	0	3	0	37
Severn Trent	4	0	0	29
Anglian	3	0	11	22
Thames	3	0	0	11
Southern	0	0	5	16
Wessex	3	0	0	14
South West	2	0	0	31
TOTAL	23	3	16	183

APPENDIX 3

CATCHMENT PLANS COMPLETED OR
IN PREPARATION IN NRA REGIONS

CATCHMENT PLANS EITHER COMPLETED OR IN PREPARATION
IN NRA REGIONS

<u>PLAN</u>	<u>FUNCTION</u>	<u>REGION</u>
R. Cam CMP	Multifunctional	Anglian
None	-	Northumbrian
R. Tawe	Water Quality	North West
R. Goyt	" "	
R. Douglas	" "	
Bollin	" "	
R. Calder	" "	
R. Roch	" "	
R. Wheelock	" "	
R. Yarrow	" "	
R. Alt	" "	
Sankey Brook	" "	
R. Irwell	" "	
Ribble Estuary	" "	
Walney Channel (tidal)	" "	
R. Lune	Fisheries	
Chorlton Brook	Flood Defence	
Sankey Brook	" "	
R. Birkett	" "	
None	-	Severn Trent
R. Medway	Multifunctional	Southern
R. Darent & Cray	"	
R. Stour	"	
R. Rother	"	
R. Itchen	"	
R. Test	"	
R. Torridge	Multifunctional	South West
R. Taw	"	
Lower R. Colne	Multifunctional	Thames
R. Start	"	
Marsh Dykes	"	
R. Taff	Multifunctional	Welsh
R. Tywi	"	
R. Tawe	"	
R. Rheidol	"	
R. Ogmore	"	
R. Cleddau	"	
R. Conwy	"	
Menai Straits (tidal)	"	

Moors River

Multifunctional

Wessex

R. Wharft

Multifunctional

Yorkshire

R. Aire

Note: This is not a list of full CMPs but simply various types of plan (some of which are multifunctional) prepared for catchments or sub-catchments.

APPENDIX 4

CATCHMENT MANAGEMENT

PLANNING GUIDELINES

CATCHMENT MANAGEMENT PLANNING GUIDELINES

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Catchment Management Planning is the process by which problems and opportunities for enhancement within a catchment can be addressed in an efficient and cost-effective manner. It does not attempt to provide a replacement for the day-to-day Functional operations that are currently undertaken by the NRA. These Guidelines written for the benefit of NRA staff responsible for presenting CMPs propose a framework within which a series of catchment problems may be identified and addressed.

The process is split into a number of steps involving evaluation of the current state of the catchment, an assessment of current and future water related uses in the catchment, preparation of a Catchment Management Plan and then the implementation, monitoring and updating of the Plan.

Each step is described in a logical sequence and pointers to the appropriate areas for consultation and liaison are provided. Reference in these Guidelines to 'consultation' should not be confused with the DoE's responsibility for consulting on statutory WQOs.

2. INTRODUCTION

2.1 What is Catchment Management Planning?

The water environment is increasingly becoming a focus for a variety of passive and (inter)active uses and activities. The NRA is responsible for examining the interaction between such activities/uses and the water/associated land environment, and reconciling any conflicts that may arise. It is proposed that the most effective and efficient approach to this management and planning process is through the production of a Catchment Management Plan (CMP).

Catchment Management Planning is the process of ensuring that all the problems and opportunities resulting from the demands within a catchment are presented within a well-defined, and yet flexible framework capable of maximising the overall well-being of that catchment.

Catchment Management Planning is inherently multi-functional and represents the amalgamation of both technical and managerial expertise from areas such as:

- i) Conservation
- ii) Fisheries
- iii) Flood Defence/Land Drainage
- iv) Navigation/Recreation
- v) Water Resources
- vi) Water Quality/Pollution Control

2.2 In drawing up the Plan, the NRA will, as far as possible, attempt to accommodate the reasonable requirements of all the parties concerned, having due regard to the relative importance of the issues and activities involved. Inevitable difficult decisions will have to be made but what is important is that the final plan is a consensus and is therefore seen as:-

..."an agreed strategy for realising the environmental potential of a catchment within prevailing economic and political constraints."

2.3 It must be emphasised that the "Catchment Management Plan" as proposed is a plan for action - a set of rules for managing the catchment. In particular, it is not:-

...a highly-detailed description of the catchment (though the NRA will draw on all relevant data in formulating the Plan);

...simply a description of the NRA's work programme in relation to the catchment concerned (rather, this will be influenced by the plan).

2.4

Broadly, the approach advocated is that for each use, requirements should be identified in relation to water related catchment features:-

...water quality;

...water quantity;

...physical features associated with the river corridor

3. USERS OF THE PLAN

3.1 The Plan will be used:-

...internally, for organising the NRA's activities within the catchment;

...as a basis for negotiation with outside bodies when changes or new developments are proposed.

As such, the Plan:-

...will provide a framework, influencing the workload and approach of different departments and officers;

...will be a definitive statement of the NRA's position in relation to the catchment concerned.

4. DOCUMENTS GENERATED BY THE EXERCISE

4.1 Information relating to catchment management can usefully be presented at three levels of detail:-

... in a concise "PR handout" summarising the "Plan".

... in the definitive Plan;

... in a series of "support documents" each expanding an aspect of the Plan's coverage;

The nature of these various documents is summarised below.

4.2 The Draft Catchment Management Plan

This report and its production will provide a comprehensive guide to the present status and the future of the catchment under study. It will comprise the following information:-

Introduction to the CMP concept and introduction to the catchment: "setting the scene".

Current and future uses relating to water and the water environment within the catchment.

Definition of objectives required for these uses related to water quality, water quantity and physical features.

Identification of the current status of the catchment in relation to the objectives.

Identification of shortfalls, problems and priorities for action.

The Draft Catchment Management Plan will be used as the basis for consultation both externally and internally.

4.3 The Catchment Management Plan

The successful completion of the consultation will prompt the production of the Catchment Management Plan. This report will outline the areas of work and investment the NRA has scheduled in order to maximise the well-being of the catchment. The report, together with the process by which it is produced, will comprise the following:-

Summary of the catchment and the consultation process.

Summary integrated action plan.

4.4 Format

Following a single page Introduction which is common to all the plans undertaken, a double-page format is advocated throughout, with a page of text facing a map of the catchment which locates the points of interest and provides such summary information as can be accommodated without obscuring the simple message. For example, discharges could be represented by arrows of varying size according to the magnitude of the load involved.

An example of text and facing map is shown in Fig. 2, taken from the River Torridge Catchment Management Plan.

4.5 The "Support Documents"

By their very nature, these documents will cover a wide range of issues and it is not appropriate to give rigid guidelines for the style and length to be applied in all cases. However it is appropriate that support documents covering the same topic in different catchments are presented in the same style and employ the same procedures for data collection and manipulation.

It is envisaged that a library of routine will be built up and this will allow these support documents to be assembled using "off-the-shelf" packages, where appropriate. As new routines are devised, so they will be added to the library.

The specific role of the support documents is to provide technical arguments leading to the statements and conclusions presented in the main Plan, and it is important that these too should be presented clearly and concisely. Data should be summarised as far as it is possible without losing the level of detail required to substantiate a conclusion; the reader who requires greater detail should simply be referred to the various technical reports which the support document themselves draw on.

Containing, as they do, data of a specialist nature, it is envisaged that, collectively, these support documents:-

... will be invaluable in summarising, at a useful level of detail, information relating to particular topics throughout the NRA;

... will be fertile breeding grounds for ideas which can be assimilated, with confidence and with benefit, into NRA policy.

An additional point: the most detailed ("lowest-level") information of use in catchment management will often be that which is held on the various computer-based databanks. While there may be some justification in including summary analytical data and certain feature-file retrievals in "technical appendices" referred to by the support document, it would be more sensible to access the relevant databank directly, in the knowledge that the information retrieved is the most up-to-date then available. This has obvious implications for the way:-

...central databanks are organised, particularly with respect to their allowing catchment and sub-catchment based (or Geographical Information Systems) retrievals;

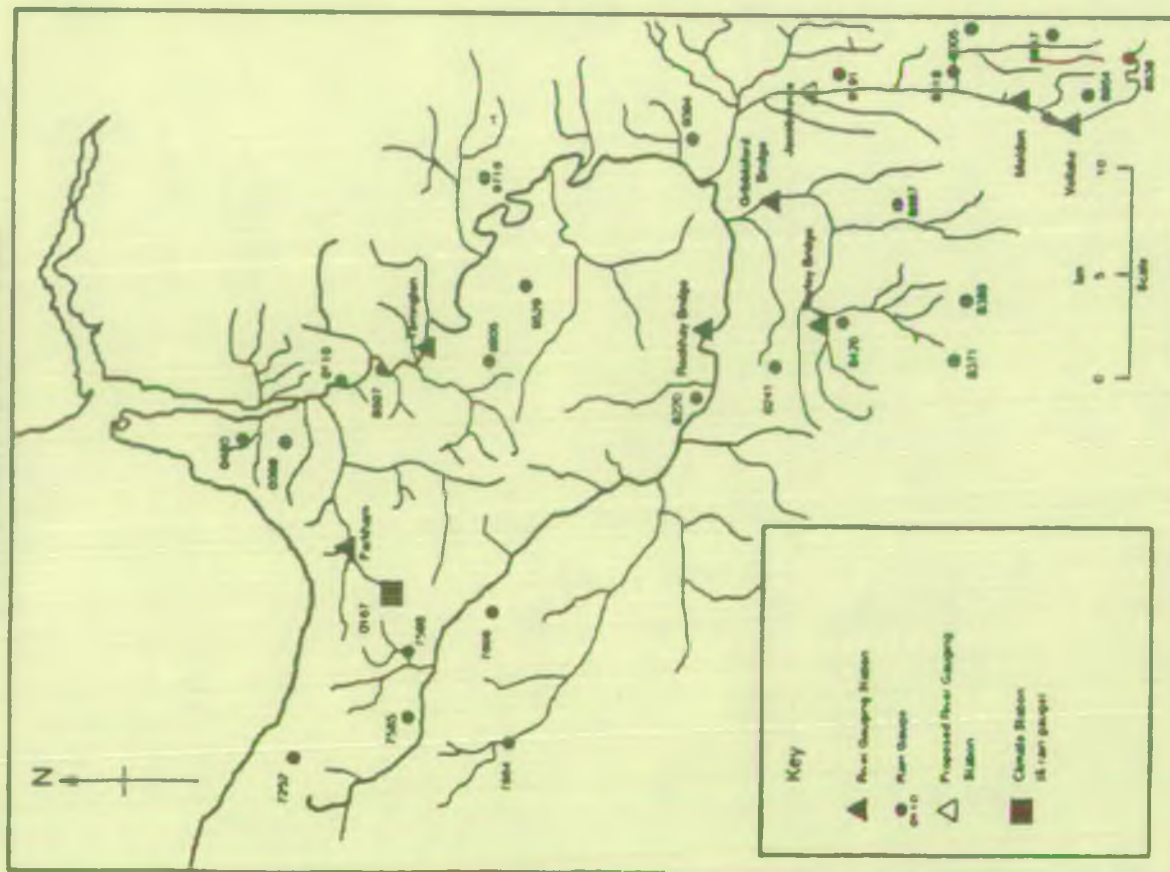
...specialised databases, such as Catchment Inventory Databases, are developed.

4.6 The "PR Handout"

This will be aimed at the General Public for distribution at Authority offices, open days, public events, and on demand.

This document should be "glossy" and professionally produced. While there should obviously be no attempt to present detailed technical information there is no reason why the scope and scale

The Torridge Catchment HYDROMETRIC NETWORK



2.3

Hydrometric Network

Rainfall is measured at 26 stations within the catchment but the full suite of climatological data is only monitored at Melbury (0167).

There are 7 river flow gauging stations in the Torridge Catchment from which data is recorded every 15 minutes, validated and stored in the Hydrometric Archive.

Flow Gauging Stations	River	NCR	No. Years Data Collected
Gribbleford	Lew	SS 528014	1
Meldon	West Okement	SX 563917	14
Norley	Lew	SX 501999	1
Parkham	Yeo	SS 393221	14
Rockhay	Torridge	SS 507070	1
Torrington	Torridge	SS 500185	28
Vellake	West Okement	SX 557903	14

There are also 5 instantaneous water level stations used for flood warning purposes. These are monitored daily and data is stored on hard copy.

Flood Warning Stations	River	NCR
Bradworthy	Meldon	SS 319141
Dolton	Torridge	SS 547112
East Okement Farm	East Okement	SX 605913
Sheepwash	Torridge	SS 488057
Weare Giffard	Torridge	SS 472226

There are no groundwater stations in the Torridge Catchment.

of our involvement in a catchment should not be accurately reflected by:-

...photographs of important features;

...a map of the catchment, detailing points of interest;

...a summary of the catchment's problems;

...photographs of NRA personnel at work;

...a summary of the proposed plan of action;

...an address to contact for further information

The length of the document should not exceed four A4 pages.

5. OVERVIEW OF PROCESS

In each case the preparation and production of a Catchment Management Plan should be the responsibility of a group headed by a Project Manager and comprising a representative from each function together with representatives from support functions such as planning liaison as required. An outline of the requirements for such a group is given in Annex A.

The basic process of producing a Catchment Management Plan is detailed in Table 1.

In essence the process is one of identifying the uses required of the water environment in the catchment, the setting of objectives and standards in relation to the features of the catchment and the functions of the NRA, comparison of these with the present status and the identification of an action plan to remedy shortfalls.

Table 1: Flow Chart of the Catchment Management Planning Process

<u>THE CATCHMENT MANAGEMENT PLAN</u>	
Step I	Set-up multi-Functional Catchment Planning group
Step II	Identify current and future uses
Step III	Identify objectives for Catchment uses
Step IV	Identify current status of the catchment
Step V	Identify catchment shortfalls, priorities and options for action
Step VI	Draw-up Draft Catchment Management Plan for consultation
Step VII	Consultation
Step VIII	Produce final Catchment Management Plan

Step IX	<u>IMPLEMENTATION OF THE CATCHMENT MANAGEMENT PLAN</u>
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Step X	<u>MONITORING AND UPDATING THE PLAN</u>
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6. THE CATCHMENT MANAGEMENT PLAN

6.1 Step 1 Set up multi Functional Catchment Management Planning Group.

If the Catchment Planning process is to be a successful one, there must be full interfunctional co-operation. A multi-functional Catchment Management Planning Group should, therefore, be set up ensuring that its composition will provide adequate managerial and technical support to the planning/managerial process.

Preparation of a Catchment Management Plan is a major project and the usual project management and controls must be applied.

6.2 Step II Identify current and future uses.

1. Identify all current and likely future uses of water and the water related environment within the catchment. This will require input from the Planning Liaison Section within the Region together with consideration of Strategic and Local Plans. Formal external consultation should be avoided at this stage.

2. The following possible uses have been identified.

Basic amenity
Ecosystem conservation
SSSI's
Salmonid Fishery
Cyprinid Fishery
Commercial Fishery
Commercial Shell Fishery
Angling
Boating
Immersion sports
Potable water abstraction
Industrial abstraction
Agricultural abstraction
Water transfer
Mineral working
Solid waste disposal
Industrial effluent disposal
Sewage effluent disposal
Surface water drainage - urban development
 - agricultural land
Wet fencing
Livestock watering
Water power (including Mill Rights)
Flood water storage
Navigation

6.3 Step III Identify objectives and standards for Catchment Uses

1. Identify the conditions required in the catchment in order that the uses can proceed satisfactorily. Objectives will be defined in relation to:

Water quality
Water quantity
Physical features

2. At this stage the objectives required are identified solely in relation to the uses. Conflicts will be identified and resolved at a later stage. An example of the text and related map for each use is shown in Fig 2, taken from the River Torridge CMP.
3. The object of this section is to combine the requirements of all the legitimate uses in order to produce single, summary "Synoptic maps" with respect to water quality, water quantity and physical features.

These synoptic maps are the yardstick by which the NRA's management of the catchment can be judged.

Synoptic Map : Water Quality

The Environmental Quality Standards EQSs adopted for each use are considered together in order to derive the Master EQS to be adopted for each relevant determinand for each stretch. Clearly, the Master EQS is equal to the strictest use-related EQS that applies. In order to rationalise the presentation, information relating to several determinands can be summarised succinctly by creating EQS Suites. The EQS of a prescribed use-related objective of controlled waters is defined as that limiting value of a measurable parameter which is just sufficient to allow that use of the waters.

There is a complication here: many of the river reaches will already have a quality objective couched in terms of the existing NWC classification, which is not use-related. There must be a proviso, therefore, that the quality objective for any parameter cannot be more lenient than that embodied in the NWC class which applies. In the longer term, the existing quality objectives will be replaced by statutory Water Quality Objectives.

In the text:-

...present a table, defining the various EQS Suites.

On the map:-

...illustrate which EQS Suite applies to each stretch.

An example of text and associated synoptic map is shown in Fig. 3 taken from the River Torridge CMP.

Synoptic Map : Water Resources

There are two factors to be considered here:-

...the volumes of water which need to be held in the catchment at various times of the year.

...the flow conditions which are required at specific control points within the catchment for resource management, which maintaining minimum acceptable flows for environmental protection.

On the map:-

The Torridge Catchment SALMONID FISHERIES

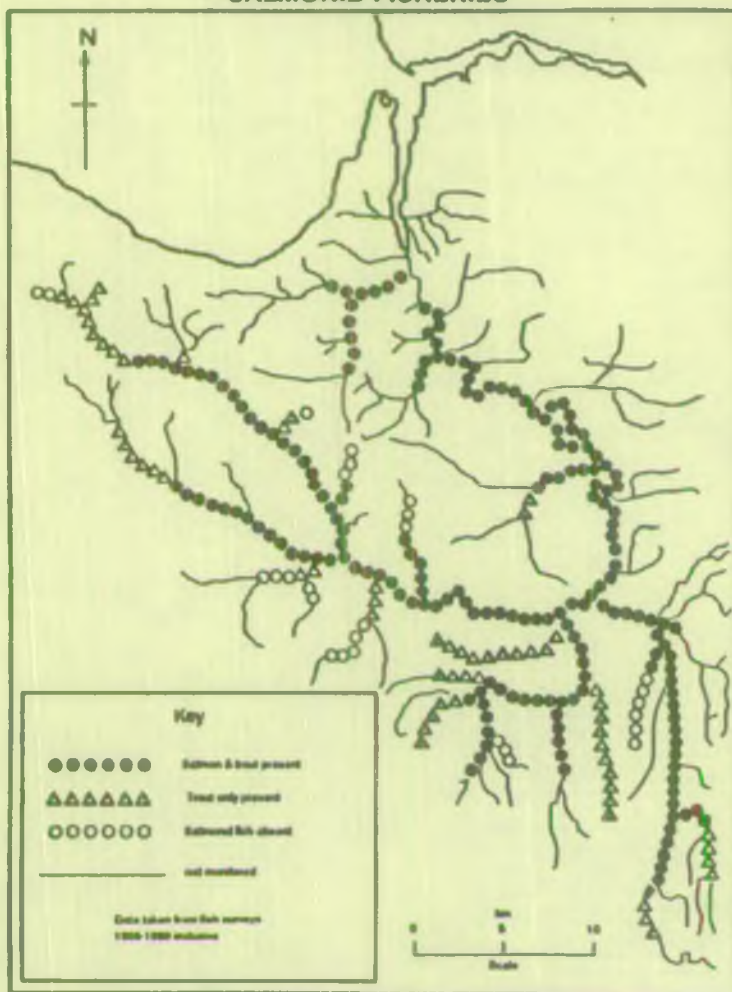


FIG 3. Example of text and associated synoptic map for water quality for all catchment uses, taken from the River Torridge CMP.

4.1 WATER QUALITY TARGETS - RIVER TORRIDGE CATCHMENT

4.1.1 General

The water quality requirements for all the uses can now be combined to give a map representing the targets for the whole catchment. Clearly, the quality requirement that applies for any given downstream in a particular stretch is equal to the strictest use-related requirement that applies.

4.1.2 Local Perspective

Surface Water:

Consideration of the diverse different uses in the River Torridge Catchment generates a number of areas where the different water quality requirements apply. The requirements or Environmental Quality Standards to achieve the water quality targets are included in Appendix 9.

	WATER QUALITY SITES						
	A	B	C	D	E	F	G
Water Quality Suite 1 Aesthetic Criteria	*	*	*	*	*	*	*
Water Quality Suite 2 List 1 Substances	*	*	*	*	*	*	*
Water Quality Suite 3 Sensitive Aquatic Life	*	*	*	*	*	*	*
Water Quality Suite 4 Other Aquatic Life	*	*	*	*	*	*	*
Water Quality Suite 5 Possible Abstraction	*	*	*	*	*	*	*
Water Quality Suite 6 Irrigation of Crops	*	*	*	*	*	*	*
Water Quality Suite 7 Watering of Livestock	*	*	*	*	*	*	*
Nitrate (dissolved) mg/l 1 year = 1995/21	*	*	*	*	*	*	*
Ammonia (un-ionised) mg/l 1	15(AA) 21(95P)	15(AA) 21(95P)	15(AA) 21(95P)	15(AA) 21(95P)	21(AA) 42(95P)		
Ammonia (total) mg/l 1	310 (95P)	700 (95P)	700 (95P)	700 (95P)	700 (95P)		
Dissolved Oxygen mg/l 1	>8(50P) >7(RUN)	>8(50P) >7(RUN)	>8(50P) >7(RUN)	>8(50P) >7(RUN)	>7(50P) >6(RUN)	>7(50P) >6(RUN)	>7(50P) >6(RUN)
Dissolved Oxygen 1 cat. mg/l 1	>8(50P) >7(RUN)	>8(50P) >7(RUN)	>8(50P) >7(RUN)	>8(50P) >7(RUN)	>7(50P) >6(RUN)	>7(50P) >6(RUN)	>7(50P) >6(RUN)
BOD (ATU) mg/l	3(95P) 5(95P)	5(95P) 5(95P)	5(95P) 5(95P)	5(95P) 5(95P)	5(95P) 5(95P)	5(95P) 5(95P)	5(95P) 5(95P)

* Water Quality Suite app. no. 15(AA) = Annual Average; 21(95P) = 95 percentile
 (RUN) = All values to exceed this number; 15P = 5-percentile;
 150P = 50-percentile

The water quality target areas (or Environmental Quality Objectives) are shown on the accompanying map and reflect the potential use of the river system.

Nitrate (dissolved) as N:

8 mg/l as an annual mean when Total Hardness <50 mg/l CaCO₃
 20 mg/l as an annual mean when Total Hardness 50-100 mg/l CaCO₃
 50 mg/l as an annual mean when Total Hardness 100-200 mg/l CaCO₃
 100 mg/l as an annual mean when Total Hardness >200 mg/l CaCO₃

Groundwater:

Discussions are underway at national level to determine the approach the DA should take on groundwater quality objectives. Until these have been established, targets cannot be set.

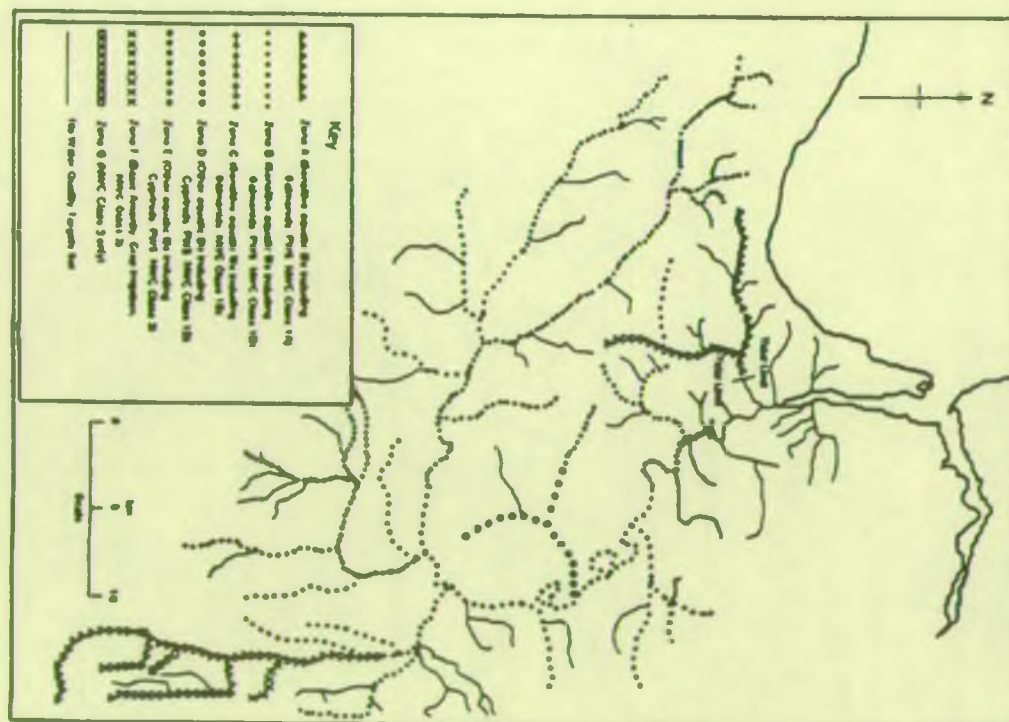
4.1.3 Pollution Control Targets

In absence of national targets, regional targets have been adopted.

To reduce the number of serious pollution incidents affecting underground and surface waters by the development of pollution prevention campaigns such as the farm campaign.

To enforce the pollution law in accordance with the national guidelines for prosecution.

To assess and promote protection zones and Nitrate Sensitive Areas in consultation with RAFF and relevant interested parties.



The Torridge Catchment
WATER QUALITY TARGETS

...indicate the flow required at strategic points throughout the catchment eg compensation flow, minimum acceptable flow.

In the text:-

...provide details, as appropriate.

Synoptic Map : Physical Features

The term "Physical Features" embraces many different features and care has to be taken to prevent the synoptic map from becoming unduly cluttered. This can be achieved by categorising the feature types as far as it is possible, and by maximising the use of symbols in portraying their location.

In the text:-

...list the physical feature types required by the uses identified eg weirs, maintained channels, flood protection schemes, trout spawning beds, reed-beds, mudflats, access to the river.

On the map:-

...identify the river reaches/areas concerned.

A suggested, but not exhaustive, list of physical features is:-

- Veirs and sluices
- Maintaining channels
- Flood protection schemes
- Spawning beds
- Reed beds
- Riverside vegetation
- Mudflats
- River access
- Riverside paths
- Bridges - road and rail
- Road & Railway lines
- Channel cross section
- Channel gradient
- Bed material
- Bank material
- Pools & riffles
- Land use - arable
 - pasture
 - developed
- Jetty
- Fish passes
- Fish
- Bank height
- Litter
- Special Conservation areas
- Archaeology and Heritage sites

6.4 Step IV Identify current status of the catchment.

1. Identify the current conditions in the catchment. This will need to be done in relation to the three basic features of:-

Water quality
Water quantity
Physical features

2. Each of these will comprise a double page of map and text as in step III, as illustrated in Fig 4, taken from the River Torridge CMP.

6.5 Step V Identify Catchment Shortfalls, Priorities and Options.

1. At this stage the information gathered in Steps II, III and IV are brought together.
2. The steps in the process are as follows:-
 - 2.1 Compare the objectives required for the catchment uses (identified in stage III) with the current status of the catchment (identified in stage IV).
 - 2.2 Where shortfalls exist identify options for action.
 - 2.3 Evaluate the actions in terms of cost, benefit, levels of service, NRA strategies and policies. Hence determine priorities and feasible options.

3. Tackling the Problems

In this section, the problems identified above are tackled one by one, with a double-page allocated to each problem. This rationalisation is seen as essential in order to focus attention, to clarify out the actions. In short, there is a better chance that the plan will actually be carried through.

While at first sight this approach may seem to carry with it the danger of over-simplification, this need not be the case. Although the problems are tackled individually, their resolution may require several actions by different groups and the requirement for co-operative effort in solving a particular problem can in fact be emphasised.

Please note that there is no need here to present the arguments leading to the proposed solution, or indeed to list alternative solutions which were considered but rejected. These can be fully discussed in the relevant support document and would simply cloud the issue if presented in the Plan.

4. Format

Double page 2 Tackling problem 1

In the text:-

...summarise problem very briefly;
...outline the agreed options;
...identify responsibility for actions
...state agreed timetable.

On the map:-

...indicate area(s) affected by problem;
...indicate area(s) involved in the remedial action;

FIG 4. Example of text and map summarising current status of a catchment taken from the River Torridge CMP.

5.2 STATE OF THE CATCHMENT - WATER RESOURCES - RIVER TORRIDGE CATCHMENT

5.2.1 General

The cumulative licensed abstraction data for the catchment is tabulated below:

Source by type	No. of licensed sources in yield range					Cumulative Abstraction	
	<20	>20 <200	>200 <1000	>1000	Total	m ³ /d	m ³ p.a.
Groundwater	76	1	-	-	77	324	105,154
Surface Water*	10	5	-	13	28	59,971	17,148,384
All	86	6	-	13	105	60,295	17,253,538

Note* Many of these abstractions are returned to the river system with little or no loss of resources except for a short reach which may be bypassed locally.

The hydrological statistics calculated at the tidal limit (excluding the River Yeo sub-catchment which flows into the Torridge below the tidal limit) are as follows:

Catchment Area	787 km ²
Theoretical Average Daily Flow	16.71 m ³ /sec
Theoretical Q95 Flow	1.11 m ³ /sec

The total licensed surface water abstractions (excluding reservoirs) represent 4.0% of the total resources. Daily cumulative abstraction represents 4.2% of the average daily flow and 53% of the Q95 flow.

However, a number of the larger surface water abstractions return the bulk of the water abstracted to the river so the figures exaggerate the impact of these abstractions.

5.2.2 Problems Identified

The accompanying map (1) shows the surface water abstraction sites and indicates a number of problem areas.

Two detrimental effects can be caused to river flows by abstraction:

- (i) downstream flows can be reduced to around Q95 values for prolonged periods;
- (ii) a bypassed section of reach (e.g. by a leak) can suffer a serious reduction in flow.

Including "licences of entitlement", all new licences are issued with prescribed flow conditions to protect from very low flows. These are weighted to take account of water quality standards and existing abstractions and consented discharges. When flows fall below the prescribed flow, abstraction must stop.

Licences are only required for groundwater abstractions in the south of the catchment, outside the Exemption Area or along valley bottoms where river gravels occur. The known abstractions shown on map 2 suggest that the number within the Exemption Area may be significant. The cumulative impact of these is not known.

The cumulative impact of the presumed large number of exempt surface water abstractions for agricultural purposes is also unknown.

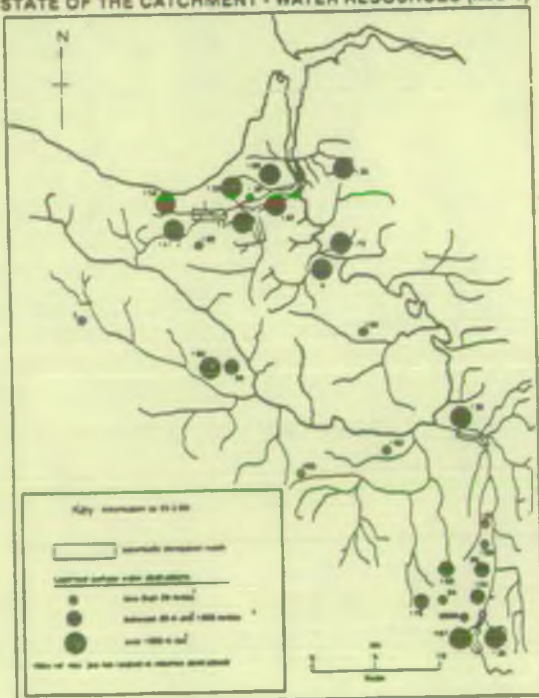
Reidon Reservoir is intensively used both for direct supply and to support abstractions at Torrington at times of low flow.

This Reservoir, plus the ability of BSWL to support supplies from the catchment from Roadford Reservoir, is likely to restrict their requirement for additional resources for public supply from within the catchment. Current strategy entails examination of the river abstraction at Torrington. Studies will be necessary to determine appropriate licence conditions to fairly protect designated water uses.

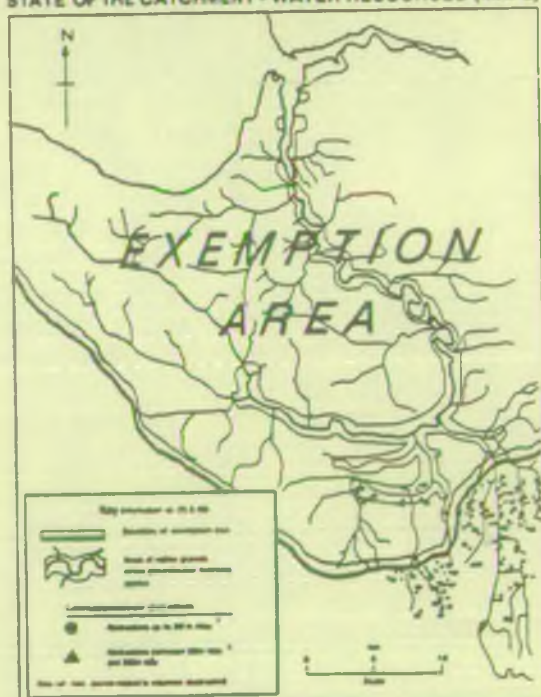
There is a requirement to increase the compensation flow from Reidon Reservoir in 1991. Consideration will be given to the most appropriate use for this water for environmental benefit.

Less use is now made of minor impoundments in the catchment for supply purposes.

The Torridge Catchment
STATE OF THE CATCHMENT - WATER RESOURCES (MAP1)



The Torridge Catchment
STATE OF THE CATCHMENT - WATER RESOURCES (MAP2)



The format used should be based on a map and text presentation eg:-

Double-page 3 Tackling problem 2.

An example of text and associated map is shown in Fig. 5, taken from the River Eurwg CMP.

6.6 Step VI Draw-up draft Catchment Management Plan

1. The draft CMP would take the following form:

Introduction to the concept of Catchment Management Planning and to the catchment:

Current and future uses.

Objectives and standards required for the uses.

Current status

Shortfalls, priorities and options for action. At the draft stage the action plan will necessarily be tentative but should be firmed up following consultation.

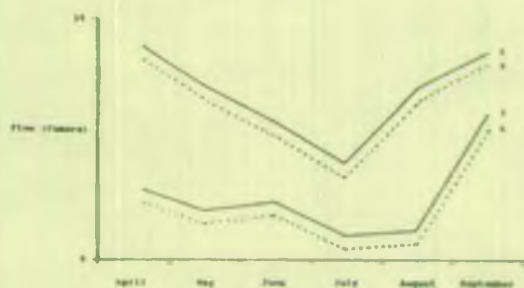
Summary of actions. An example for a programme summary is given in Fig. 6, taken from the River Eurwg CMP. It should be noted that sensitive or confidential costs need not be disclosed in the report.

6.7 Step VII Consultation

1. Consultation on the Draft Catchment Management Plan is required both with Functional Management within the Region, with the Regional Committees and with relevant external bodies. Statutory Committees should be consulted first and should later be invited to consider the responses of other consultees and to advise where differences have to be resolved. Reference here to consultation should not be confused with the DoE's responsibility for consulting on statutory WQO's.
2. The aim here is to obtain agreement to the objectives and standards required and to the problems and priorities for action identified.
3. The following, non-exhaustive list gives an indication of likely consultees.

Local and County Councils
Sewerage and water undertakers
Riparian owners
Local residents associations
MAFF/ADAS
IDB's
HMIP
Harbour Authorities
Forestry Commission
CLA
Major industry in the catchment
Welsh Development Agency
Sports Council

Eurvg Catchment The Dock Feeder Abstraction



MONTHLY MEAN FLOWS (CUMEC)

- 1 & 2 Mean Values 1970-1988
- 1 & 4 Drought Year 1986
- 1 & 3 Upstream of Dock Feeder
- 2 & 4 Downstream of Dock Feeder

FIG 5.

Example of text and map summarising a specific problem and the action plan to resolve it, taken from the River Ewyrw CMP.

7. THE DOCK FEEDER ABSTRACTION

7.1 Nature of Problem : The river flow in the Ewyrw is reduced below the Dock Feeder Weir by the diversion of flow along the Dock Feeder. While in a typical year the abstraction does not reduce river flow to the natural Q95 value, in the prolonged dry weather experienced during drought years, over half the flow is abstracted and much of the channel runs dry.

7.2 Cause of Problem : The abstraction is made by the Llansurw Docks Board, in order to maintain water levels in Victoria Dock and South Dock, which both lose water to the sea as the tide falls. Over a typical tidal cycle, the volume of water abstracted equates to a fall in level of 2.5m in each dock.

7.3 Solutions : In drawing up a solution to this problem, it was recognised that:-

- o Legally, the Llansurw Docks Board have a right to abstract whatever amount of water they wish from the Ewyrw along the Dock Feeder, and are therefore not obliged to change their current practice.
- o Environmentally, this practice can be tolerated within the stated minimum flow target for the catchment over the whole of a typical year.
- o In assessing the importance of maintaining water levels, a distinction can be drawn between the needs of the South Dock which is still fully operational and the Victoria Dock which is now closed to shipping and is thus simply an amenity feature.

The following course of action has therefore been formulated:-

- (1) Repairs to both Docks, in order to minimise the largest identifiable point losses (Llansurw Docks Board).
- (2) Installation of pumping equipment, in order to transfer water from the Victoria Dock to South Dock, whenever river flow in the Ewyrw falls to the natural Q95 value (Llansurw Docks Board).

In addition, negotiations will continue between the NRA and the Llansurw Docks Board with a view to reducing the total dry weather period abstraction towards the NRA's target, subject to some form of remuneration package being devised.

7.4 Timetable & Financial Implications:-

SCHEME	1990	1991	1992	1993	1994	1995	ONE-OFF COST £k	ANNUAL COST £k
1		-----					320	15
2			-----				300	*
TOTAL							620	*

* These costs depend upon the flow regime in the Ewyrw. As a highest estimate, it has been calculated that, with the anticipated reduction in leakage from the Docks, the revenue cost of maintaining the above pumping strategy would amount to £65000 over a drought year similar to 1984.

12. PROGRAMME OVERVIEW

TABLE 1 : SUMMARY OF EXPENDITURE BY PROBLEM AREA

PROBLEM AREA	1990	1991	1992	1993	1994	1995	ONE-OFF COST £k	ANNUAL COST £k
REDUCING BOD LEVELS	-----						1765	115
REDUCING AMMONIA LEVELS		-----					1400	60
RAISING DISSOLVED OXYGEN LEVELS	-----						0	0
RESOLVING POOR BIOLOGICAL QUALITY		-----					540	20
MANAGING THE LITTER PROBLEM	-----			----			220	85
THE DOCK FEEDER ABSTRACTION		-----					620	00
FLOOD ALLEVIATION	-----						1690	90
HABITAT IMPROVEMENT		-----					810	90
SALMONID BREEDING HABITAT		-----			-----		160	10
WEIRS AND SALMONID MIGRATION		-----		-----			295	14
TOTAL							7500	504

* Costs already included in figures for reducing BOD & Ammonia levels.
 ** Costs dependent on flow in R. Eurwg; maximum estimate in worst years = £65k.

TABLE 2 : SUMMARY OF EXPENDITURE BY PARTICIPATING ORGANISATION

ORGANISATION	ONE-OFF COST £k	ANNUAL COST £k
BRITISH RAIL	50	10
CELTIC WATER plc	2860	70
CENTOL plc	150	45
FORESTRY COMMISSION	150	20
GLAN EURWG DISTRICT COUNCIL	780	85
GLO DYFRIG plc	690	35
LLANEURWG DOCKS BOARD	620	*
NATIONAL RIVERS AUTHORITY	2195	184
ROBINSONS plc	5	45
TOTAL	7500	504

* Costs dependent on flow in R. Eurwg; maximum estimate in worst years = £65k.

National Farmers Union
Farming Union of Wales
Countryside Council
National Trust
English Heritage
Angling Clubs
British Waterways Board
Navigation Authorities
RSPB
NRA Regional Committees
CBI
Action Groups
British Canoe Union
General public in the locality

4. Considerable investigation and negotiation may be necessary before an acceptable and practical action plan can be drawn up.

6.8 Step VIII Produce Final Catchment Management Plan

The final plan may now be produced and distributed to all concerned parties ensuring that all previously consulted parties are included in such a distribution.

Following the successful completion of the CMP, the NRA's role will be to ensure that the plan is put into effect within the appropriate timescale. Within the overall Action Plan, the Catchment Management Group (see Annex A) should agree an action plan for each of the NRA's Functions. This Functional Action Plan will be an internal document which should not be included in the CMP report disseminated to outside bodies. Overall implementation including the action of other organisations, will be monitored by the Catchment Planning Co-ordinator, although the effectiveness of the technical components can only be assessed by the individual Functions themselves.

The implementation of the proposals will inevitably vary from one Region to another as well as from catchment to catchment and, as such, this set of guidelines does not attempt to formalise the approach to this phase.

An important component of the whole process of Catchment Management Planning is the monitoring and updating of the plan itself. The plan must be monitored for its appropriateness and comprehensive nature and, in the event of it proving to be out of date, it must be updated. It is inevitable that some catchments will change in characteristics more quickly than others and, as such, the period for updating each plan cannot be standardised.

It is anticipated that the Catchment Planning Co-ordinator will, when appropriate, initiate the planning process to update the Catchment Management Plan.

MRA STAFF RESPONSIBILITIES FOR CATCHMENT PLANNINGProject Sponsor

A senior manager nominated by the RGM with responsibility for the catchment Management planning initiative in the Region.

Catchment Planning Co-ordinator

To co-ordinate the Catchment Management Groups.

Project Manager

A senior manager to act as chairman of each Catchment Management Group.

Core Staff (as required)

Water Quality	WQO/Discharge/Pollution
Water Resources	Groundwater/Abstractions/Flow
Flood Defence	Levels of Service/Capital Schemes
Fisheries	Stocks/Exploitation
Recreation/Conservation/Navigation	Habitats/Land Use/Amenity

Support Staff (as required)

Corporate Planning	Resource implications/requests
Finance	Audit accountability
Information Technology	Data/System Commonality/IT strategy
Public Relations	Consultation/Liaison/Feedback
Legal	New and future legislation
Planning Liaison	Town & Country Planning
Administration Support	Filing/clerical duties

Wherever possible at least one of the Management or Core members of the Group should have operational responsibility for the catchment being studied.