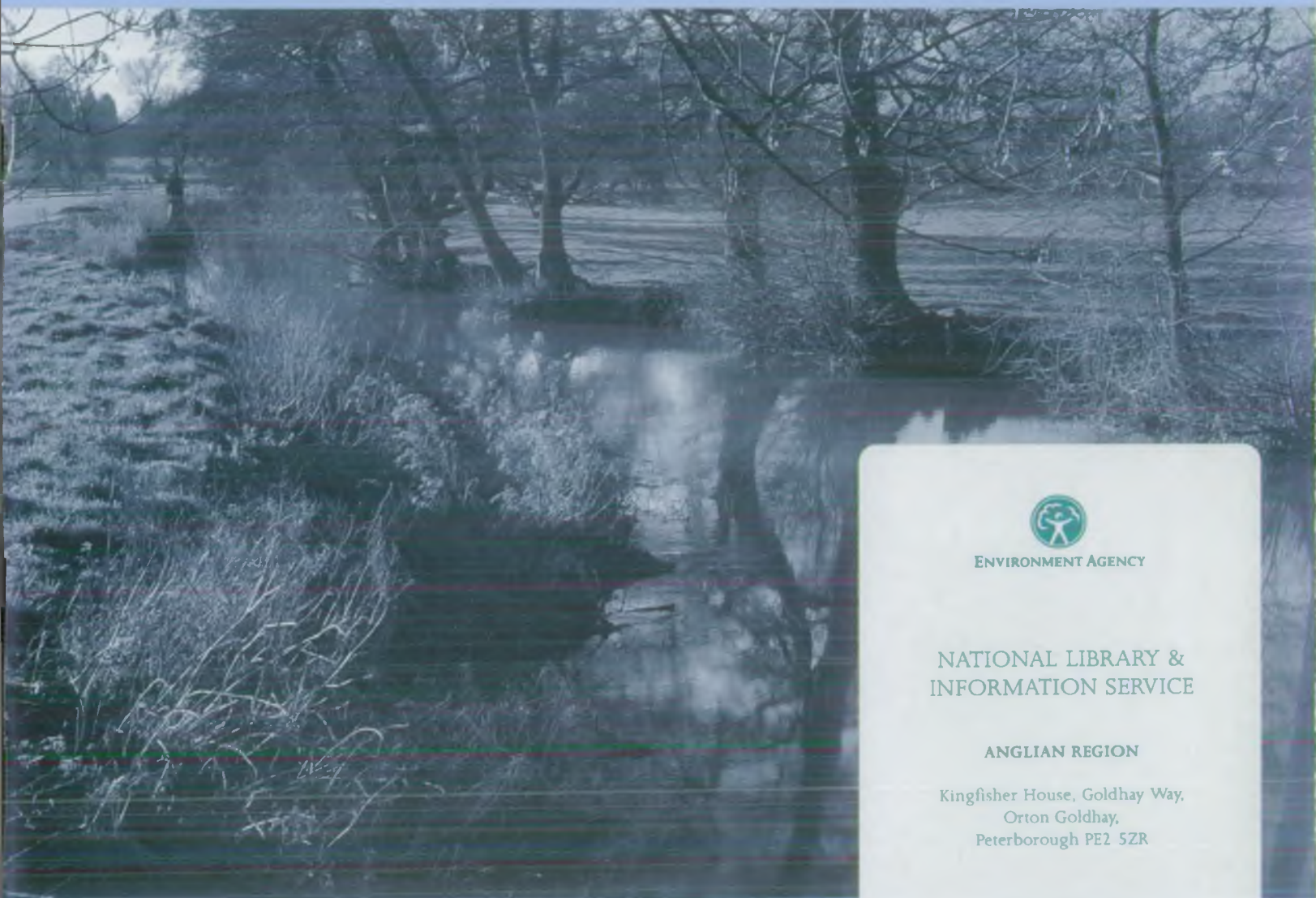


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RIVER CHERWELL CATCHMENT MANAGEMENT PLAN ACTION PLAN



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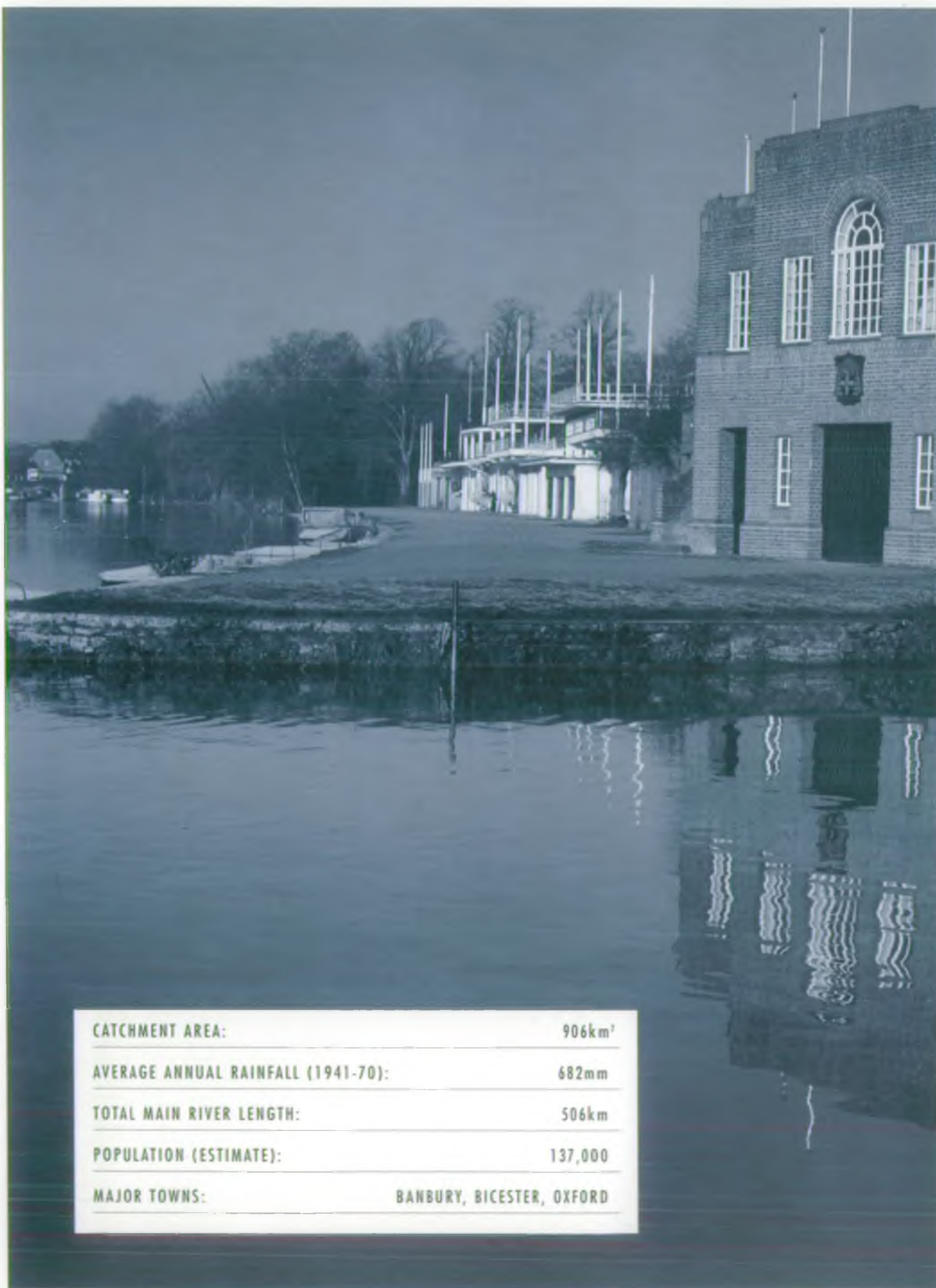


NRA

National Rivers Authority
Thames Region

February 1996

KEY CATCHMENT STATISTICS



CATCHMENT AREA:	906km ²
AVERAGE ANNUAL RAINFALL (1941-70):	682mm
TOTAL MAIN RIVER LENGTH:	506km
POPULATION (ESTIMATE):	137,000
MAJOR TOWNS:	BANBURY, BICESTER, OXFORD

Confluence of River Cherwell and River Thames at Oxford

Front cover: River Cherwell at Cropredy

VISION FOR THE RIVER CHERWELL CATCHMENT

In preparing the catchment vision, the NRA has defined what it would wish the catchment to be and the principles we will be following in working towards that vision. The catchment vision may not be something that can be achieved in the next five years, but it is something that we can all work towards.

Whilst the Cherwell catchment lies largely within Oxfordshire it also encroaches into Buckinghamshire to the east and Warwickshire and Northamptonshire to the north. From its source at Charwelton to the Thames confluence, the river generally flows north to south and over a length of about 96 km falls 100 metres, draining an area of over 900 km².

Agriculture is the main land use in the catchment and has influenced the character of its countryside and landscape. The contribution made by the River Cherwell to the character of Oxfordshire in particular is recognised by several policies in the Structure Plan which seek to protect and enhance its natural features.

The catchment is not densely populated and development pressures vary throughout the countryside.

The Cherwell above Banbury and most of the tributaries have good water quality and host a variety of fish species. Riverside flood meadows, particularly at the lower end of the Cherwell, also provide a high conservation value to the area with a number of Sites of Special Scientific Interest (SSSIs) located in this region. The Environmentally Sensitive Area (ESA) designation of the majority of the catchment should go a long way to protect and enhance the wet meadow habitats along the valley.

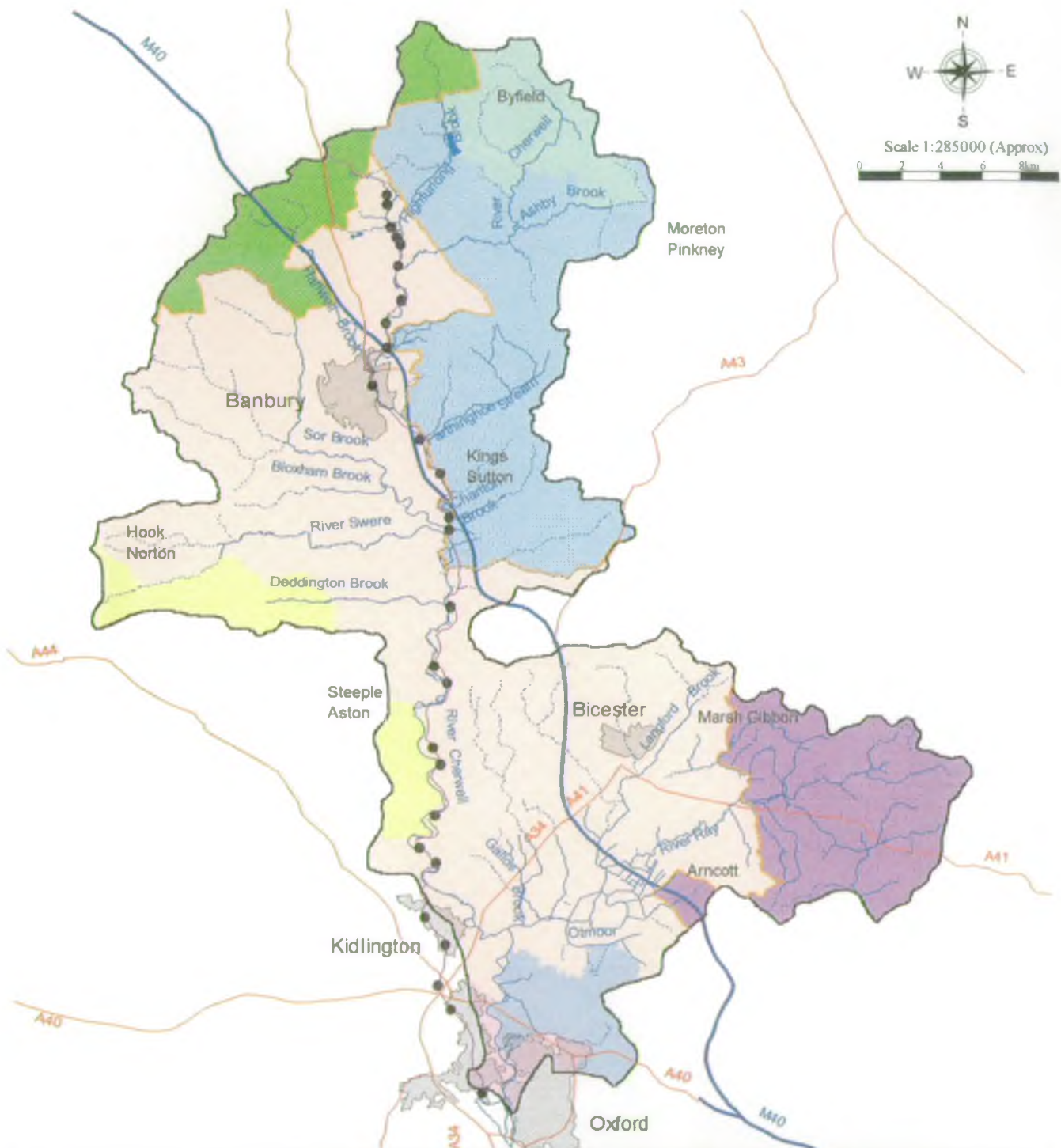
The catchment is home to approximately 137,000 people who value the Cherwell as an important water resource, and for the quiet pleasure and enjoyment that it brings to their local communities.

Conflicting demands and land use changes proposed for the catchment will need to be addressed within a framework of community participation, environmental sustainability and a managed but cautious approach where necessary. Our aim is not only to maintain the existing values of the Cherwell water environment, but also to:

- *raise awareness of the value of the water environment to all users in the Cherwell catchment;*
- *gain consensus on decisions affecting the water environment;*
- *manage land and water use changes within the broader framework of imposed political, economic and physical processes to the benefit of the water environment;*
- *improve both water quality and quantity below Banbury;*
- *produce a water level management plan for Otmoor by 1998 and for other water dependent SSSIs, to address the sometimes conflicting needs of land owners, farmers and nature conservation;*
- *promote, assist and facilitate the Upper Thames ESA scheme to help it meet its objectives;*
- *facilitate the conservation and enhancement of biodiversity targets;*
- *ensure that future development in and around Banbury is sustainable and that peak flood flows are attenuated via source control.*

Establishing strong NRA involvement and links with government bodies, industry and local communities within the catchment is necessary to ensure that all views are considered and that future development decisions respect this vision for the future well-being of the Cherwell catchment. The NRA therefore welcomes this opportunity to work in partnership with all relevant parties to maintain and enhance the water environment.



FIGURE 1: CATCHMENT OVERVIEW


General Features				Local Authorities			
	CMP Boundary		Water Body		Urban Areas		Stratford-on-Avon
	Main Rivers		Lock		County Boundary		Davertry
	Non Main Rivers				Motorway		S. Northants
	Oxford Canal				A Road		Cherwell
							West Oxfordshire
							South Oxfordshire
							Oxford City
							Aylesbury Vale

FOREWORD

The integrated management of river catchments is a fundamental philosophy for the NRA, and Catchment Management Plans (CMPs) are fundamental to integrated management. While catchment planning may be a relatively new concept, CMPs are nevertheless becoming one of the cornerstones to the NRA's corporate business planning process.

CMPs allow for bids to be made for funding which take full account of the priorities as perceived by the "customers". They are therefore important in the business planning framework. Not only do they demonstrate our accountability to the customer and to the communities in which we are working but they also provide a public representation of our commitment to integrated catchment management.

This Action Plan is the third of its kind completed in the West Area of the NRA Thames Region. As Guardians of the Water Environment, we are becoming better known amongst our local authorities, environmental groups and local communities, and those having an interest in the water environment.

It is our wish to build on this reputation and environmental awareness, and to make a difference to the quality of the water environment which takes full account of public expectations. This can only be achieved when, in partnership with others, we lead the thinking on water management and development and persuade and influence those who can support and carry this action plan forward.

The Cherwell catchment contains many valuable sites for conservation and recreation as well as pressure points for future development. Through the implementation of the actions in this plan, our shared aim is to ensure the well being of the rivers, canals and groundwater of this catchment in a sustainable and integrated manner.



S J Darby
Area Manager (West)
NRA Thames Region

This book is due for return on or before the last date shown below.

17 MAR 2003

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INTRODUCTION

The National Rivers Authority

The National Rivers Authority (NRA) was established in 1989 as an independent public body with statutory responsibilities for safeguarding and improving the water environment in England and Wales. The Authority is responsible for water quality, water resources, flood defence, fisheries, conservation, navigation and recreation as outlined in our mission statement:

"We will protect and improve the water environment by the effective management of water resources and by substantial reductions in pollution. We will aim to provide effective defence for people and property against flooding from rivers and the sea. In discharging our duties we will operate openly and balance the interests of all who benefit from and use rivers, groundwater, estuaries and coastal waters. We will be businesslike, efficient and caring towards our employees".

The NRA places a particular emphasis on planning for environmental sustainability, through adopting an integrated, multi-functional approach to river management. We recognise the need to work with local authorities, the local community, landowners, interest groups, industry and other agencies whose activities and uses interact or impact on the water environment.

The Environment Agency

In April 1996, the Environment Act will bring together the NRA, Her Majesty's Inspectorate of Pollution and the local Waste Regulation Authorities into one single Environment Agency. The creation of an Agency with a remit to protect and enhance the environment embodies the principles of sustainable development and is of vital importance as we move towards the next century.

Catchment Management Planning

The rivers, lakes, estuaries and coastal waters of England and Wales have never before been subject to such large and rapidly increasing demands from the users of water. Many different uses interact or compete for water and inevitably come into conflict with one another.

The process of catchment management planning has been developed to help manage these interactions and conflicts for the overall benefit of the water environment and its users. Through catchment planning we establish a long term vision for the catchment. To meet this we set objectives for environmental improvements and prevention of future environmental damage whilst considering the many demands on the water environment in the catchment.

Catchment Management Plans translate the principles set out in the mission statement into action. In the plans the vision for each catchment is described, problems and issues are identified and actions proposed that may be taken to resolve them.

This document represents the action plan stage of the catchment planning process and describes the activities that the NRA and others hope to undertake over the next five to ten years. The plan also provides the means of promoting two key aspects of environmental management - land use planning and water quality objectives. Land use planning is discussed in detail later in the plan while water quality objectives are outlined in Appendix 1.

REVIEW OF THE CONSULTATION PROCESS

One of the fundamental objectives of catchment planning is to involve all interested parties in working with the NRA towards planning for the future well being of the catchment. To this end the NRA is committed to the process of public consultation on all its Catchment Management Plans (CMPs).

During August and September 1994 informal consultation on the River Cherwell CMP took place with a wide range of organisations external to the NRA including parish councils, local authorities environmental groups and businesses. The results of this informal process were then fed into the Consultation Report.

The Consultation Report was published in April 1995 and distributed to some 250 consultees, marking the start of the formal public consultation process. The report was publicised through press releases, radio interviews and posters which were displayed at the meeting venues, local tourist information offices, county and district libraries and all civic offices within the catchment. As a result, around another 200 documents were sent out.

As part of the consultation process, public meetings were held at Bloxham and Bicester during May and June 1995. In addition an invited audience attended a meeting held in Banbury. The aim of the meetings was to allow people to voice their opinions and concerns about the catchment. They also provided an opportunity to meet other interested organisations and individuals together with key NRA functional staff. Display panels and posters were set up at these meetings.

Two questionnaires were sent out with the Consultation Report. They were designed to encourage consultees to respond broadly to all the issues in the CMP and not just their own areas of interest. The consultation period deadline was the 14th July 1995, which gave consultees a period of three months to return any comments and their completed questionnaires.

Approximately 40 copies of each questionnaire were completed and returned and around 50 specific written responses were received. Responses to the first

questionnaire indicated that the Consultation Report was professionally produced and conveyed the right sort of image for the NRA. Over 80% of respondents thought the report was well written, easy to understand and adequately covered all of the issues raised during the consultation process.

The responses to questionnaire II highlighted the following as the most significant issues contained in the Consultation Report:- the poor biological quality in a number of watercourses; the need for control of development within the floodplain; the failure of a number of reaches to achieve their water quality objectives and the management of water levels on Otmoor and at other sites within the catchment.

Many of the written responses were concerned with amending and editing the text of the Consultation Report, rather than highlighting issues or providing new information. The responses did give a useful indication of where the consultees saw priorities for improvement.

Whilst no new issues were identified from the consultation process, an additional issue was highlighted by NRA staff. This involved the discovery of low fish populations in the River Cherwell between Banbury and Lower Heyford during a recent fish survey. This additional issue has been added to the Action Plan as Issue 11.

Overall the response from the public to the consultation process was positive and encouraging. The view that an extensive consultation process was essential to promote wide acceptance of the Action Plan was fully supported. The opportunity to get involved in shaping future NRA activity was also appreciated by the consultees.

The Activity Plans, which form the main part of this document, take the consultees responses into account and have been greatly enhanced by their input. A more detailed "Statement on Public Consultation and Report of Findings" is available from NRA's West Area Office if required.

OVERVIEW OF THE CATCHMENT

Description

The Cherwell catchment covers an area of 906km² and has a population of approximately 137,000. Whilst the catchment lies largely within Oxfordshire, it also encroaches into Buckinghamshire to the east and Warwickshire and Northamptonshire to the north. The major urban areas include Banbury, Bicester, Kidlington and parts of Oxford. (see Figure 1 and Key Statistics inside the front cover).

The catchment extends southwards from the headwaters of the river at Charwelton in Northamptonshire to its confluence with the River Thames at New Hinksey, Oxford. As it drains southwards, tributaries of the Cherwell include the Ashby Brook, the Highfurlong Brook, the Hanwell Brook, the Farthinghoe Stream, the Sor Brook, the Charlton Brook, the River Swere and the Deddington Brook. Shortly before the Thames confluence the Bayswater Brook flows into the main River Cherwell.

The River Ray is the largest tributary of the Cherwell. It rises near Quainton and flows 32km south west to its confluence with the Cherwell at Islip. The Langford Brook joins the River Ray just north of Charlton-on-Otmoor.

The River Cherwell shares its valley with the Oxford Canal and for much of its course the canal runs parallel to the river, actually crossing it at Nell Bridge and occupying the same channel for the 1.5 km between Enslow and Shipton-on-Cherwell.

The Cherwell is a predominantly clay-based catchment, the headwaters of which are found on the Lower Lias clay to the north of Banbury. The flow in the Cherwell in this upper part of the catchment is derived mainly from drainage of the clays and from springs. Further south the flow in the river is increased by springs issuing from the Inferior Oolite, which is exposed in the valley sides. The river then flows over the Inferior Oolite and Great Oolite limestones, with groundwater from these aquifers contributing to the base flow of the river.

Within the catchment, there are a number of small reservoirs at Wormleighton, Boddington and Clattercote which provide water for the canal. In addition there is a raw water storage reservoir at Grimsbury, owned by Thames Water Utilities Limited (TWUL) and used for public water supply (see Figure 2).

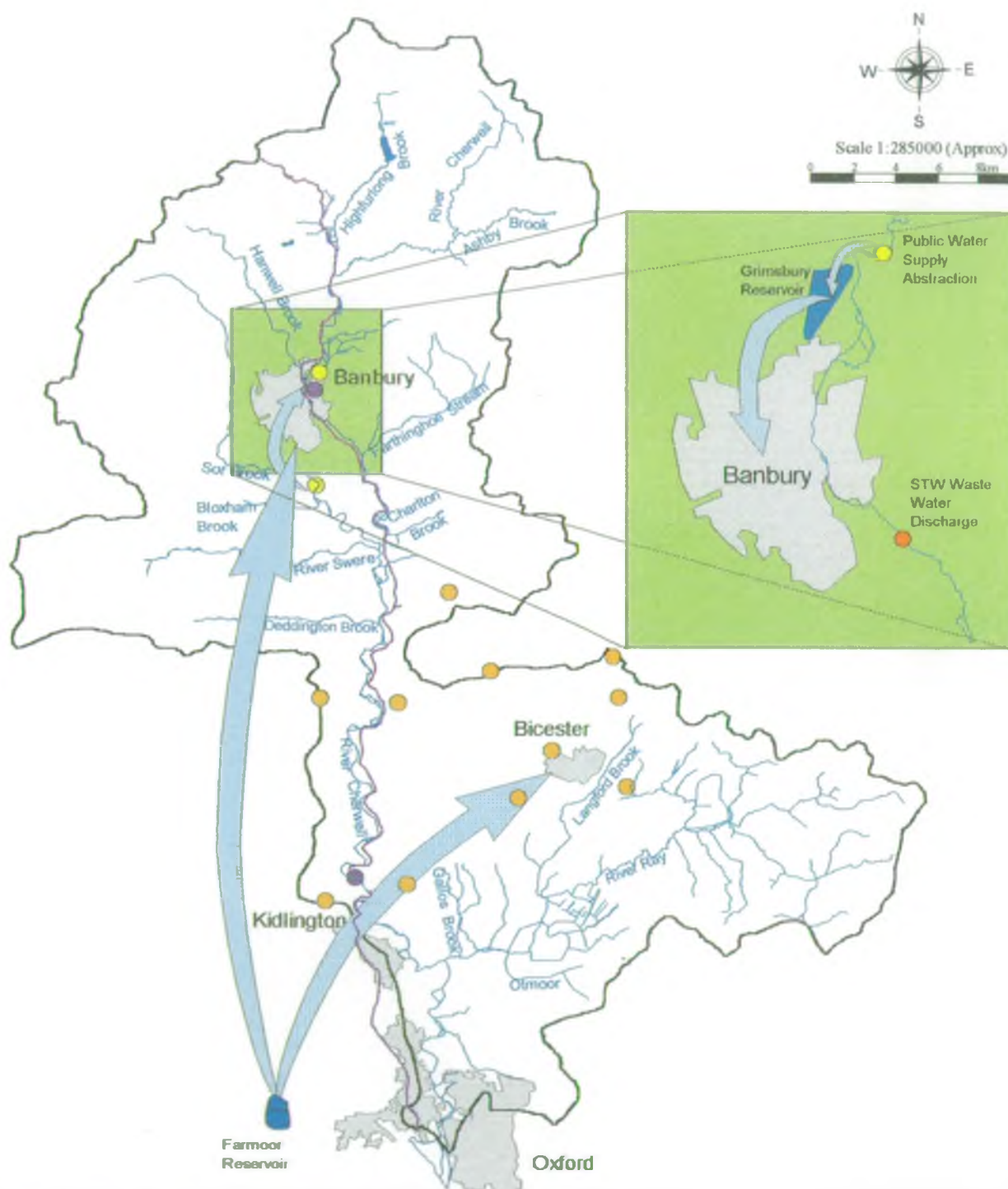
The opening of the M40 has increased development pressures in the catchment by making the area more accessible from London and Birmingham. The Oxfordshire Structure Plan Strategy (1992) seeks to direct development to the four 'country towns' of Banbury, Bicester, Didcot and Witney in order to relieve development pressure on Oxford and in the rural areas. The current Oxfordshire Structure Plan 2011, Consultation Report (Aug. 1995) puts forward four options for comment. These are listed later under Urban Land Use.

Recent surveys indicate water quality in the Cherwell catchment to be predominantly 'fair', with 26 of the reaches being in this category, 14 being 'good' and 6 'poor'. The 6 reaches classified as 'poor' are in this category owing to sewage effluent or agricultural pollution.



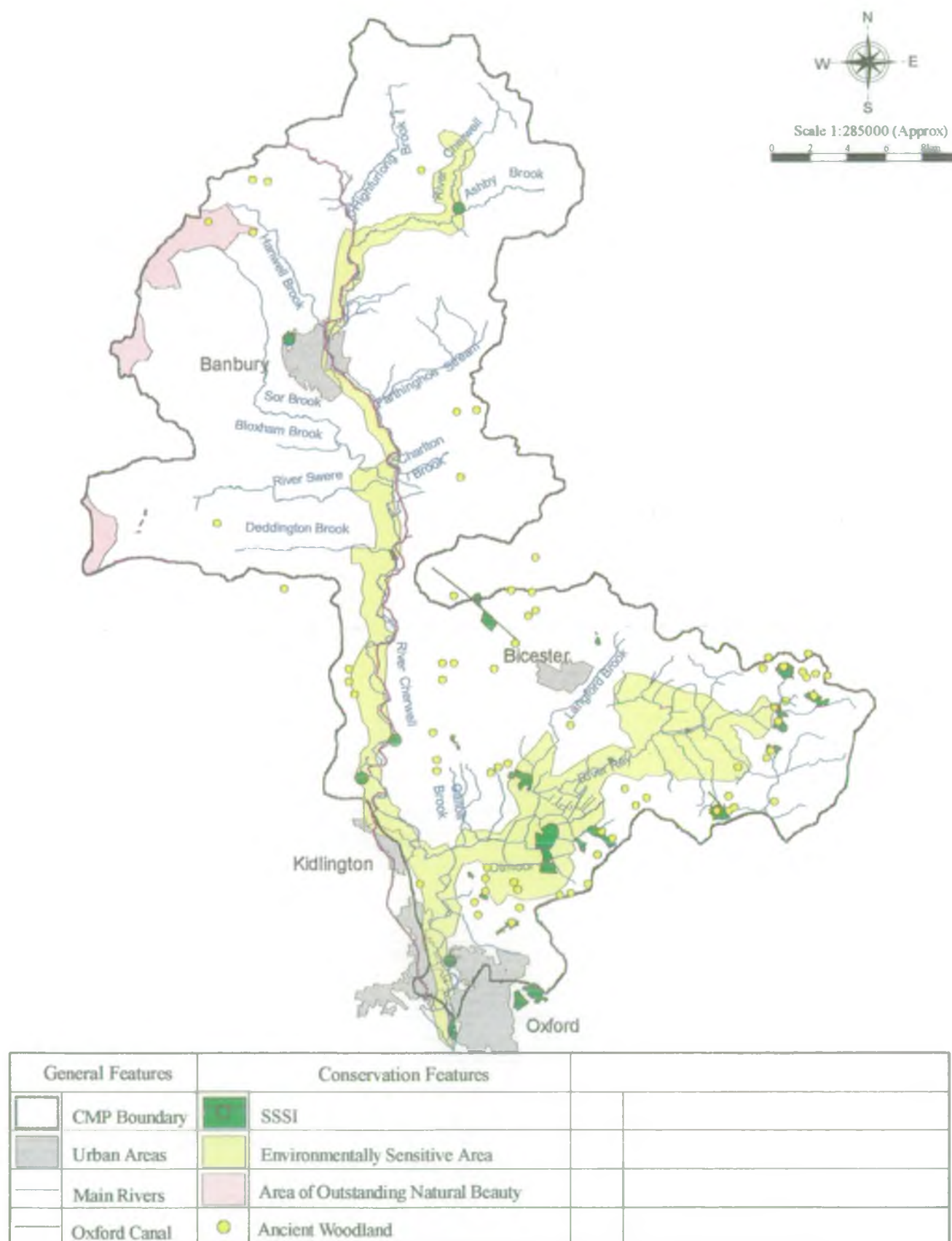
River Cherwell at Islip

FIGURE 2. WATER RESOURCES AND ABSTRACTIONS



General Features		Water Supply	
	CMP Boundary		Public Water Supply >1 Ml/Day
	Urban Areas		Other >1 Ml/Day
	Main Rivers		Groundwater Level Monitoring Station
	Oxford Canal		Direction of Public Water Supply Movement

FIGURE 3. NATURE CONSERVATION



Review of Uses and Resources

The uses and resources of the catchment were described in detail in the Consultation Report. The key features are as follows:-

Nature Conservation

There are 12 SSSIs located adjacent to watercourses within the Cherwell catchment (see Figure 3). One of these, Otmoor SSSI, provides valuable waterside meadows alongside the River Ray and is the best site for breeding waders in the Upper Thames area. A Water Level Management Plan (WLMP) will be produced for the Otmoor site during 1996/97.

The Cherwell Valley is also of particular ornithological importance, particularly as winter flood meadows.

Both Otmoor and the valleys of the Rivers Ray and Cherwell are included in the Upper Thames Tributaries Environmentally Sensitive Area (ESA). Uptake by landowners of this MAFF funded scheme has been encouraging in its first year.

An otter habitat project has recently begun within the catchment. This will assess the suitability of the catchment for otters and will recommend enhancements which will benefit both otters and other wildlife.

Landscape and Heritage

The Cherwell floodplain along much of the valley is an attractive area characterised by flood meadows, areas of agricultural land and large open fields. The Cotswold Hills (to the west of the catchment) are considered to be a high quality landscape and as such have been designated an Area of Outstanding Natural Beauty (AONB).

Development in the catchment can be traced back to early Saxon times with the establishment of a settlement on the Cherwell, which later became known as Banbury.

Archaeological and other historical remains are abundant throughout the catchment and include Alchester Roman site, Wendlebury and Deddington Castle which are scheduled ancient monuments.

Amenity and Recreation

The River Cherwell, River Ray and the Oxford Canal are used for a wide range of recreational activities including boating, punting, canoeing, angling and walking. The Oxford Canal is a major attraction for boat users and is the second most popular stretch of Canal in the country. There is an extensive network of rights of way, including a number of long distance paths, such as the Oxfordshire Way and the Jurassic Way.

Fisheries

The Cherwell catchment is predominantly a coarse fishery with the River Cherwell itself supporting a variety of fish species. Upstream of Banbury the fish population is dominated by roach and dace; carp and barbel are also present.

Navigation

Management and control of navigation on the Oxford Canal is the responsibility of British Waterways. There is no statutory right of navigation on the Cherwell, although it is used extensively by punts and canoes, especially in the Oxford area. Craft entering the River Thames from the Cherwell are required to comply with NRA requirements for the River Thames.

Water Abstraction

Rivers provide the main resource for abstraction within the catchment, the vast majority of which is used for agricultural purposes. The greatest use (in volume) is for public water supply which accounts for 64% of the total licensed abstraction, but the majority of this water is returned to the River Cherwell downstream of Banbury (see Figure 2). Groundwater abstracted within the catchment is used mainly for small agricultural supplies, none is used for public water supply.

Effluent Disposal

There are 153 consented discharges in the Cherwell catchment. Those from Thames Water Utilities Limited (TWUL) sewage treatment works comprise the largest volume. The largest discharge is from Banbury STW, which is consented to discharge a maximum of 46,800 m³/day of treated sewage into the River Cherwell.

Rural Land Use

Agriculture is the main land use in the catchment and is split between general cropping (46%) and grassland (40%). As such it has greatly influenced the character of the surrounding countryside and landscape. Several areas are currently being managed under the Countryside Stewardship Scheme operated by the Countryside Commission.

Changes in EC and Central Government agricultural policy mean that some of the arable land could be put back into non-rotational set-aside. The land adjacent to watercourses could be used to create buffers of woodland or grassland capable of enhancing the conservation value of the river corridor and reducing silt and pollutant loads entering surface waters.

Urban Land Use

Within the catchment future development of land for housing, employment, retail services and facilities will be based on Structure Plan guidance.

There are four options for future development within Oxfordshire, which makes up the majority of the catchment. These have been set out in the Consultation Draft of the Oxfordshire Structure Plan 2011 and are:-

- i) *Country Towns (including Banbury and Bicester within the catchment)*
- ii) *A new settlement at RAF Upper Heyford*
- iii) *Rail corridors*
- iv) *Dispersal to smaller towns*

Whichever development option is finally chosen, protection of the water environment should be achieved by the application of Structure Plan policies on the protection of river corridors, riparian landscapes, water resources and floodplain.

Whilst the M40 is likely to continue to be a focus for development pressures, it passes through areas of environmental restraint where it is regarded as a corridor of movement rather than development.

Mineral Extraction and Solid Waste Disposal

Ironstone reserves present along the north east of the catchment are extracted for the production of architectural masonry and used as a minor source of crushed aggregate and hard-core. There are three ironstone workings within the catchment, two of which are active at present. Two active limestone workings are also present within the catchment.

There are 16 known active waste disposal sites within the catchment which are licensed for a various categories of wastes including inert, commercial and industrial and domestic wastes.

Flood Defence

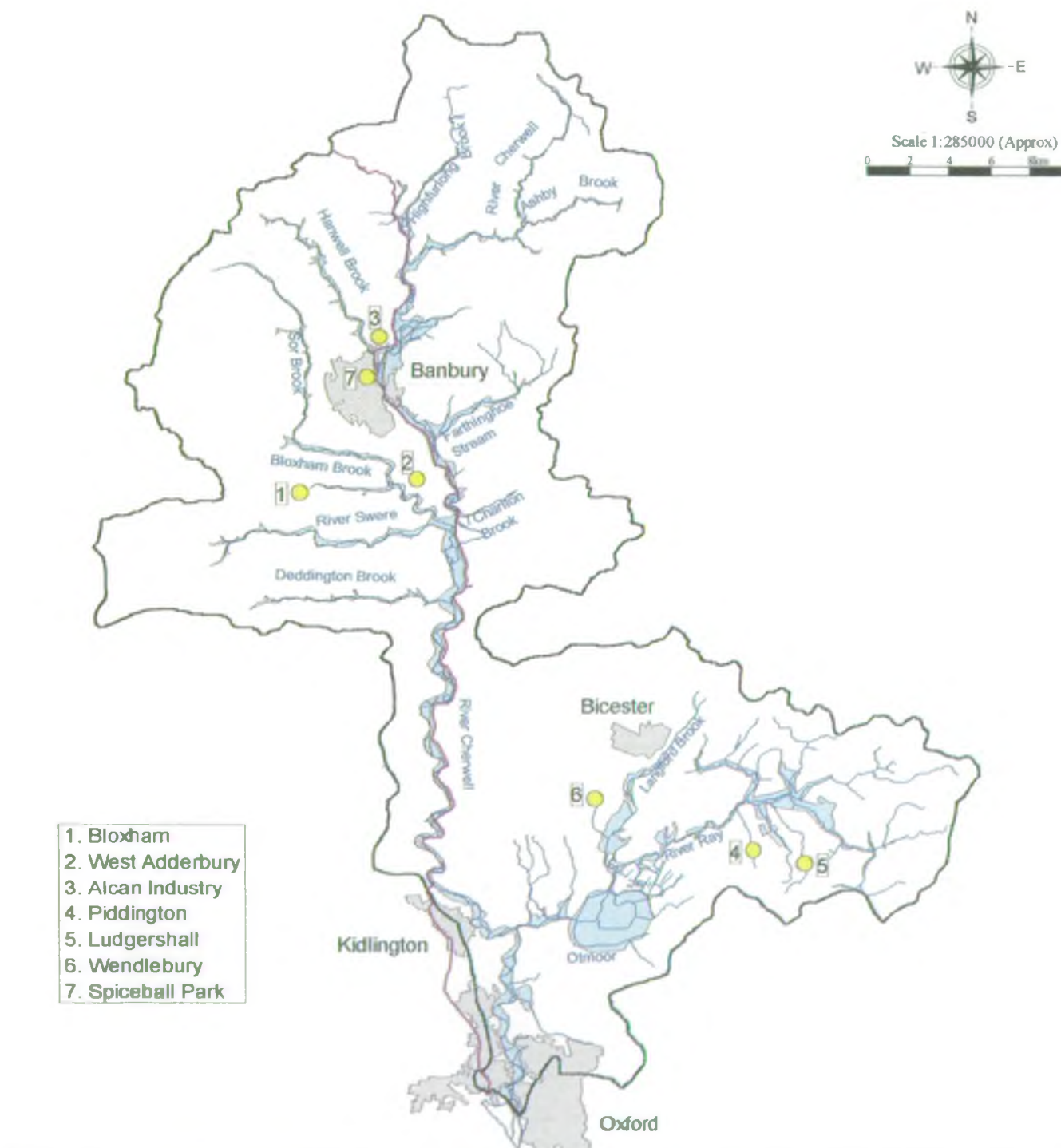
Concern has been raised over changes in run-off resulting from development in the Banbury area and the impact this may have on flood flows and water quality.

Run-off from the M40 may have resulted in localised flooding problems, notably on the Hanwell Brook. This is to be investigated as part of further studies in the area. Other areas within the catchment known to have flooded in the past century include Bloxham, West Adderbury, Piddington, Ludgershall, Spiceball Park and Wendlebury (see Figure 4).



Olmoor

FIGURE 4. FLOOD DEFENCE



General Features				Flood Defence Features			
	CMP Boundary				Areas Known to Have Flooded		
	Urban Areas				Sites at Risk		
	Main Rivers						
	Oxford Canal						

LAND USE AND THE WATER ENVIRONMENT

The broad objective of catchment management planning is to conserve and enhance the total water environment through effective land and resource management. In this way we can ensure that the needs of the present can be met without compromising the ability of future generations to meet their own needs. This approach is known as sustainable development. The role of the NRA in supporting the principles of sustainable development is to ensure that decisions throughout society are taken with proper regard to their impact on the water environment.

The control of land use and development is the responsibility of local planning authorities through the implementation of Town and Country Planning legislation. The NRA works closely with the local authorities in the production of development plans to encourage the inclusion of policies which reflect its concerns and responsibilities. A guidance document produced by the NRA entitled "Guidance Notes for Local Planning Authorities on the Methods of Protecting the Water Environment through Development Plans" identifies the water related issues that should be integrated into the land use planning system.

As a result of the promotion of NRA guidance and advice many of the local authority development plans which cover the River Cherwell catchment area now include comprehensive sets of policies which protect the water environment. This is an important step in achieving the common aim of sustainable development as it helps to reconcile the needs of economic development and effective environmental protection and enhancement.

Thames 21

In September 1995 the NRA TR published a strategic planning initiative entitled "Thames 21 - A Planning Perspective and a Sustainable Strategy for the Thames Region" which provides a regional context for the preparation of CMPs by identifying strategic development issues which these plans need to address. Thames 21 also provides a further set of principles and criteria against which NRA functional activities can be assessed for sustainable development.

Within the Cherwell catchment, Banbury and Upper

Heyford have been identified as future development pressure points. Bicester has also been identified, within the Oxfordshire Structure Plan, as a potential growth area.

Upper Heyford Study

The Upper Heyford Airbase in north Oxfordshire was vacated by the USAF in September 1994. The long term future of the site is now under discussion and it has been included in the Oxfordshire Structure Plan (Consultation Draft August 1995) as one of four possible development strategy options.

The NRA commissioned a Site Specific Study to set out the considerations on the water environment which should be taken into account when formulating proposals for the redevelopment of the airbase. The Study identifies a number of water related issues which would have to be addressed as part of any development proposals. These issues include the following:-

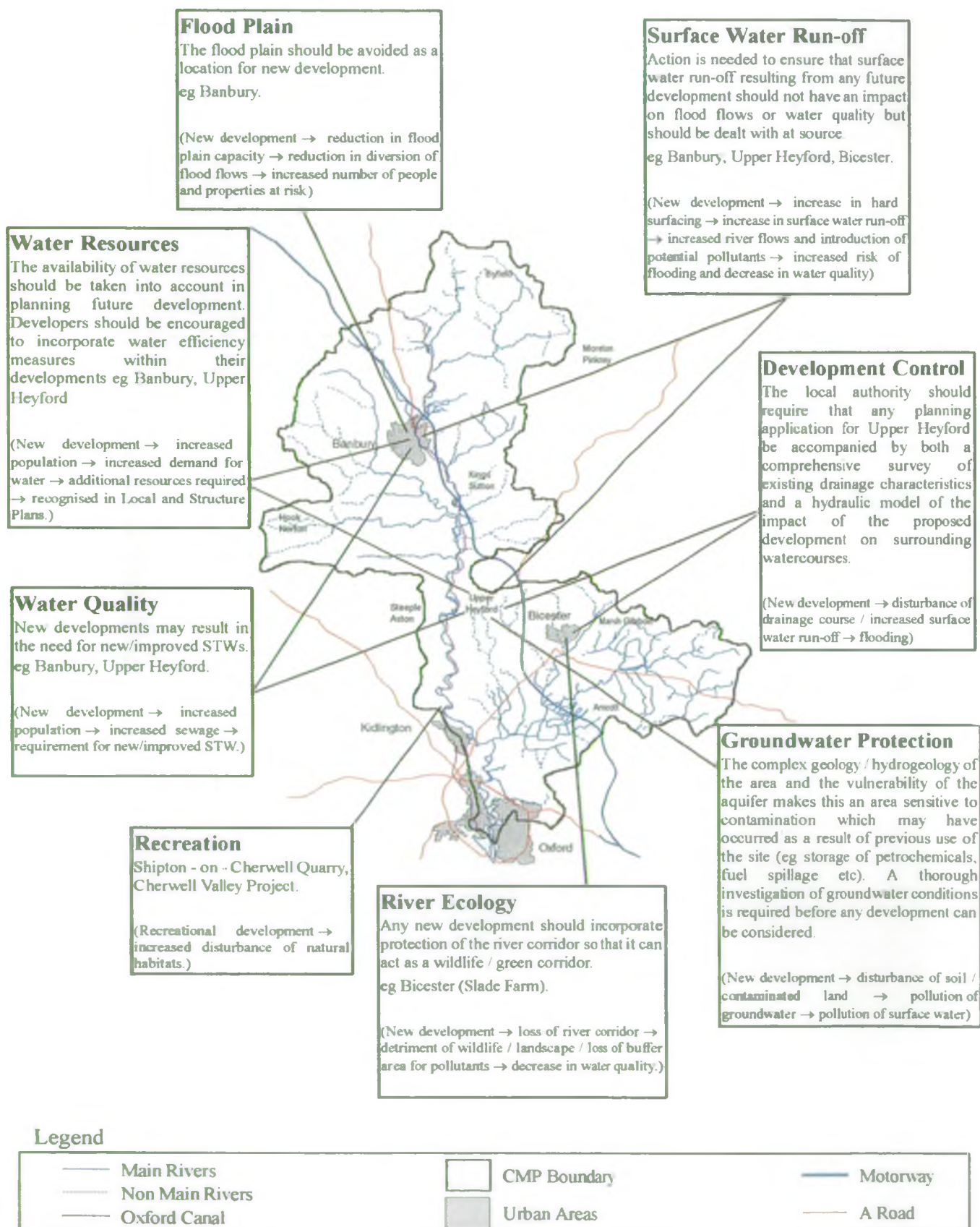
The potential for contamination of groundwater and the need for a thorough investigation of groundwater conditions before any development can be considered; the requirement to improve the sewerage infrastructure if redevelopment occurred; measures to maintain and improve water quality and thus increase the ecological value of watercourses in the vicinity of the base; the increased risk of flooding arising from the redevelopment of the site would be unacceptable and the drainage of the site should be fully investigated.

Working in Partnership

The NRA is able to participate constructively in the land use planning process across all its functional interests. It seeks to protect and enhance the landscape and wildlife conservation interests of catchments where these values are influenced by water. This is done not just by working with local authorities and seeking to influence development plans and planning applications, but also by working with a wide range of other organisations whose cooperation is needed.

Figure 5 gives examples of sites within the catchment where land use planning can help ensure the protection and enhancement of the water environment.

FIGURE 5. LAND USE AND THE WATER ENVIRONMENT



ACTIVITY PLANS

The activity plans in this report have been divided into two distinct sections; the first section deals with the activities which represent responses to the issues identified in the Consultation Report while the second section deals with other NRA activities. These may be of a more routine nature but are nevertheless essential for the future protection and enhancement of the water environment within the Cherwell catchment.

Both sets of activity plans not only take into account the Environmental Objectives set out in the Consultation Report and repeated at Appendix 2, but also follow and support the corporate strategies, aims and objectives of the NRA and its policies.

Both issue-related and general activities have been set out in tables which highlight the following information:-

- i) Organisations which would be involved with implementing the proposed activities, either in a lead role or as a key supporter, are listed under the heading 'Lead/Key Participants'. The absence of a slash (/) indicates a cooperative group effort. The different functions of the NRA, which will be directly involved with the activities, have been coded as follows:-

KEY TO NRA DEPARTMENTS

1. Environmental Services - Pollution Control (West)
2. Regional Scientific Department
3. Environmental Services - Groundwater Quality (West)
4. Environmental Services - Water Resources (West)
5. Regional Technical Department - Water Resources
6. Regional Technical Department - Hydrological and Hydrometric Services
7. Fisheries and Conservation (West)
8. Flood Defence (West)
9. Catchment Planning (West)
10. Navigation and Recreation (West)
11. Thames Engineering Group
12. Regional Technical Department - Flood Defence

- ii) A target timetable of the activity.
- iii) An estimate of cost where available. This indicative cost could be attributed to one or all of the participants and has been divided into four broad bands;

Under £10,000
 £10,000 - £50,000
 £50,000 - £100,000
 over £100,000

The abbreviation 'n-avail' means that no cost estimate is available at present.

- iv) It should be appreciated that some actions will require feasibility studies and cost-benefit appraisal of options prior to work commencing. In some cases, depending on the outcome of these studies and investigations, further action may not be justified. The NRA and participating organisations have limited resources and powers, and some work may take longer than indicated owing to funding availability, government policy or more urgent priorities.
- v) The issues and activities are not presented in any order of priority.
- vi) Please refer to Appendices 4 and 5 for the definition of acronyms.
- vii) Should new issues become apparent during the life span of this Plan further actions will be added at succeeding annual reviews.

Issue Related Activities

A brief description of each issue resulting from the Consultation Report is given below followed by the proposed activities, participants, timetable and cost estimate set out in tabular form.

The key issues identified as a result of the CMP process were as follows:-

1. Water quality: current failure to achieve river quality objectives and predicted biological status;
2. Grimsbury public water supply intake: surface water protection;
3. Effluent discharge from Banbury Sewage Treatment Works;
4. Recolonisation of the catchment by otters;
5. Water levels and habitat quality on Otmoor and other sites;
6. Quality and quantity of water in the Oxford Canal;
7. Reduced flows in the River Cherwell through Banbury;
8. Water resources in Banbury;
9. Planning and flood defence, particularly in Banbury;
10. Lack of baseline data - additional survey requirements;
11. Low fish populations in the River Cherwell between Banbury and Lower Heyford.



Oxford Canal at Enslow

ISSUE 1: WATER QUALITY: CURRENT FAILURE TO ACHIEVE RIVER QUALITY OBJECTIVES OR OBJECTIVE SET FOR FUTURE DATE AND FAILURE TO ACHIEVE PREDICTED BIOLOGICAL STATUS

The river quality objectives for a number of reaches within the catchment are not being achieved. Whilst most sewage treatment works in the area are performing substantially better than their consent standards, the maintenance of current quality cannot be guaranteed unless consent standards are tightened. In addition, some watercourses are achieving low BMWP scores.

Activity	Lead/ Key	96/97	97/98	98/99	99/2000	2000/on	Cost (£k)	Comments
1.a Investigate the requirements for targeted multi-functional surveys to address the problems of poor biological quality within the catchment area	NRA ²	■	■				<10	To include a review of existing data
1.b Installation of new water quality monitoring station at Islip	NRA ^{1,2} landowner	■	■				10-50	
1.c Designation of sensitive areas under U/WWTD	DoE, NRA ²	■					n-avail	Biological surveys
1.d Improvements to Banbury STW	TWUL/ NRA ^{2,1}		■				n-avail	For U/WWTD requirements
1.e Improvements to Bicester STW	TWUL/ NRA ^{2,1}	■					n-avail	For U/WWTD requirements and improvements to Langford Brook
1.f Improvements to Blethingdon STW	TWUL/ NRA ^{2,1}	■	■	■	■	■	n-avail	To protect water quality in Blethingdon Brook, by 2005
1.g Improvements to Byfield STW	TWUL/ NRA ^{2,1}	■	■	■	■	■	n-avail	For U/WWTD and to protect water quality in Byfield Brook, by 2005
1.h Improvements to Cropredy STW	TWUL/ NRA ^{2,1}	■	■	■	■	■	n-avail	To protect water quality in River Cherwell, by 2005
1.i Improvements to Croughton STW	TWUL/ NRA ^{2,1}	■	■	■	■	■	n-avail	To protect water quality in Croughton Brook, by 2005
1.j Improvements to Greatworth STW	TWUL/ NRA ^{2,1}	■	■	■	■	■	n-avail	To protect water quality in Farthinghoe Stream, by 2005
1.k Improvements to Hook Norton STW	TWUL/ NRA ^{2,1}	■	■	■	■	■	n-avail	To protect water quality in Hook Norton Brook, by 2005

Activity	Lead/ Key	96/97	97/98	98/99	99/2000	2000/on	Cost (£k)	Comments
1.i Improvements to Kings Sutton STW	TWUL/ NRA ^{2,1}	■	■	■	■	■	n-avail	To continue to comply with Fish Directive in River Cherwell and to protect water quality in Kings Sutton Stream, by 2005
1.m Improvements to Launton STW	TWUL/ NRA ^{2,1}	■	■	■	■	■	n-avail	To be done by 2005 to maintain water quality in Launton Brook
1.n Improvements to Marsh Gibbon STW	TWUL/ NRA ^{2,1}	■	■	■	■	■	n-avail	To be done by 2005 to maintain water quality in Summerstown Ditch and to comply with UWWTD
1.o Improvements to Middleton Cheney STW	TWUL/ NRA ^{2,1}	■	■				n-avail	To protect water quality in Farthinghoe Stream and to comply with UWWTD





ISSUE 2: GRIMSBURY PUBLIC WATER SUPPLY INTAKE: SURFACE WATER PROTECTION

There is concern over water quality in the vicinity of the Grimsbury public water supply intake, in relation to elevated concentrations of herbicides and pollution from M40 surface water run-off. There is also the impending designation of part of the River Cherwell as a nitrate vulnerable zone.

Activity	Lead/ Key	96/97	97/98	98/99	99/2000	2000/on	Cost (£k)	Comments
2.a Review the need for an assessment of the impact of M40 run-off on the quality of the rivers and groundwater in the Cherwell catchment	NRA ^{1,3}	■	■	■	■	■	n-avail	
2.b Continue the monitoring programme to meet EC Nitrate Directive requirements for the proposed NVZ in the Upper Cherwell catchment	NRA ^{1,2}	■					n-avail	Situation to be reviewed in 1997
2.c Review the sources of pesticides in the catchment upstream of Grimsbury Public Water Supply intake	NRA ¹	■	■	■	■	■	n-avail	







ISSUE 3: EFFLUENT DISCHARGE FROM BANBURY SEWAGE TREATMENT WORKS

Trade effluent from the Kraft Jacobs Suchard Ltd coffee manufacturing plant is discharged to sewer and is eventually treated at Banbury Sewage Treatment Works. The effluent from the coffee manufacturing process is highly coloured and the sewage treatment works processes have very little impact on the colour. As a result, the effluent discharged from Banbury STW is highly coloured and causes noticeable discoloration of the River Cherwell.

Activity	Lead/ Key	96/97	97/98	98/99	99/2000	2000/on	Cost (£k)	Comments
3.a Assess the nature of the impact of the coloured effluent from Banbury STW on the River Cherwell	NRA ^{1,2} , TWUL, Kraft						10-50	
3.b Take action to remedy the effects of coloured effluent from Banbury STW on the River Cherwell	NRA ^{1,2} , TWUL, Kraft						n-avail	The colour problem has been discussed with TWUL.

ISSUE 4: RECOLONISATION OF THE CATCHMENT BY OTTERS

The otter is a key species in the aquatic environment since it is near to the top of the food chain and, as such, it is possibly the ultimate indicator of the health and quality of the riverine ecosystem. The Cherwell Otter Habitat Project has recently begun within the catchment.

Activity	Lead/ Key	96/97	97/98	98/99	99/2000	2000/on	Cost (£k)	Comments
4.a Continue co-funding Cherwell Otter Habitat Project and oversee progress in order to assess suitability of catchment for otters and to identify potential habitat enhancements	NRA ⁷ , BBONT, BW, Yanamouchi Research Institute						10-50	
4.b Initiate programme of enhancements to facilitate return of otters to the Cherwell catchment following completion of Cherwell Otter Habitat Project	NRA ⁷ , landowners, BBONT						10-50 pa	

ISSUE 5: WATER LEVELS AND HABITAT QUALITY ON OTMOOR AND AT OTHER SITES

Wetland habitats, such as Otmoor, located along the river valley depend on winter flooding and high water levels to maintain their conservation value.

Activity	Lead/ Key	96/97	97/98	98/99	99/2000	2000/on	Cost (£k)	Comments
5. a Produce WLMPs for 7 agreed main river sites in CMP area and implement agreed plans; Otmoor (1996/97) Long Herdon Meadow (1997/98) Arncott Bridge Meadows (1997/98) Bestmoor (1997/98) Murcott Meadows (1997/98) New Marston Meadows (1997/98) Wendlebury Meadows (1997/98)	NRA ^{7,8} , EN, landowners	■	■				10-50	Part of Regional Contract
5. b Produce WLMPs for 2 non-main river sites in CMP area and implement agreed plans: Weston Fen, Sidlings Copse and College Pond	LAC, landowners, EN/NRA ^{7,8}	■	■	■	■	■	10-50	
5. c Investigate current water level management and assess options for future management of the lower Cherwell at University Park Weir	NRA ^{5,4,8}	■					n-avail	
5. d Facilitate schemes identified under the Upper Thames Tributaries ESA and WLMPs to enhance existing wetland sites, and restore further wetland sites by appropriate water level management, particularly in the Upper Ray Prime Biodiversity Area	NRA ^{7,8} , ADAS (ESA), EN, landowners, RSPB	■	■	■	■	■	Part of Area budget which is 150 pa	
5. e Continue to provide conservation advice on all wetland issues/river management etc. to internal and external customers	NRA ⁷	■	■	■	■	■	n-avail	

ISSUE 6: QUALITY AND QUANTITY OF WATER IN OXFORD CANAL

During periods of water shortage in the upper reaches of the Oxford Canal the flow is augmented from the River Cherwell. Numerous connections between the canal and the river have led to silt transfers, resulting in turbid water in some river reaches. The section of the canal to the west of Kidlington will be covered in the River Thames (Eynsham–Benson) and Ock Catchment Management Plan.

Activity	Lead/ Key	96/97	97/98	98/99	99/2000	2000/on	Cost (£k)	Comments
6.a Review the need for further monitoring of silt transfers between the Oxford Canal and River Cherwell	NRA ^{1,2} BW	■					<10	
6.b Investigate the feasibility of enlarging Boddington Reservoir to meet demands for water in the Oxford Canal	BW	■	■				n-avail	Includes full Environmental Impact Assessment
6.c Continue the ongoing programme of dredging along the Oxford Canal	BW, NRA ^{7,9}	■	■	■	■	■	n-avail	Ongoing. Must be undertaken in an environmentally sensitive manner
6.d Clarify the nature and location of the numerous interconnections between the River Cherwell and the Oxford Canal	BW, NRA ^{1,4}	■					n-avail	

ISSUE 7: REDUCED FLOWS IN THE RIVER CHERWELL AT BANBURY

During dry periods, abstraction from the River Cherwell at Grimsbury results in depleted flows over a 2km length of the river through Banbury. This has resulted in a reduction in the aesthetic and ecological value of the watercourse.

Activity	Lead/ Key	96/97	97/98	98/99	99/2000	2000/on	Cost (£k)	Comments
7.a Assess the impact of the Grimsbury abstraction on the River Cherwell using standard NRA methodology	NRA ^{4,2,5,7}	■					n-avail	Methodology designed to determine the severity of low flow conditions
7.b Depending on the severity of the impact of the Grimsbury abstraction, identify and assess measures for improvement, including alternative resources and channel improvements if required	NRA ^{1,2,5,7,8} TWUL		■	■			n-avail	

ISSUE 8: WATER RESOURCES IN BANBURY

Banbury has been identified as a development growth area. An increased demand on water resources will result from any further development here.













Activity	Lead/ Key	96/97	97/98	98/99	99/2000	2000/on	Cost (£k)	Comments
8.a Investigate the feasibility of future water resource options, eg. duplication of water supply mains, new resource developments, alternative WTW discharge management	NRA ⁵ , TWUL	■					n-avail	
8.b Secure practical and economic levels of leakage losses	NRA ⁵ , TWUL, OFWAT	■	■	■	■	■	n-avail	Ongoing
8.c Influence new and redevelopment to incorporate water efficient technology	NRA ^{5/6} , LAS, TWUL	■	■	■	■	■	n-avail	
8.d Develop infrastructure and resources to secure reliable supply to meet growth in demand	TWUL, NRA ^{4,5}	■	■				n-avail	



River Cherwell at Spicehall Park, Banbury

ISSUE 9: PLANNING AND FLOOD DEFENCE, PARTICULARLY IN BANBURY

There is public concern that recent development in the River Cherwell floodplain, particularly at Banbury, may have increased the frequency of flooding in some areas.

Activity	Lead/ Key	96/97	97/98	98/99	99/2000	2000/on	Cost (£k)	Comments
9.a Gather water level information in part of the Cherwell catchment by the installation of new/replacement water level gauge boards	FINCAG, NRA ^{8,4,9}						<10	Review of flooding mechanism and control structure operations
9.b Additional level monitoring sites for FD operations are proposed at Islip, Oddington, Charlton, Lower Arncott, Cropredy, Heyford, Kings Mill and Nell Bridge	NRA ⁸						50-100	Subject to cost/benefit analysis
9.c Assess impact of the M40 surface water outfalls and proposed new large developments on the quantity of water in the Hanwell Brook and River Cherwell	DoT, NRA ^{9,12} LAs						10-50	Programme to be determined
9.d Continue work of NRA's Surface Water Source Control Group to liaise with LAs' drainage and planning departments to encourage and support drainage and surface water management techniques where appropriate	NRA ^{8,12} Developer, LAs, TWUL						n-avail	To minimise impact on the river system of run-off from significant new developments
9.e Enhance existing map and flood level data for the Banbury area	NRA ^{8,9}						n-avail	Achieved via activities M.2 and O.18
9.f Assess the impact of urban run-off from Banbury	NRA ^{8,9,2} Industry, DoT, TWUL						n-avail	

ISSUE 10: LACK OF BASELINE DATA

Currently, there are no detailed landscape or geomorphological surveys, or assessments of the catchment. These baseline data are essential to establish an accurate picture of existing conditions within the catchment and enable any changes to be monitored.

Activity	Lead/ Key	96/97	97/98	98/99	99/2000	2000/on	Cost (£k)	Comments
10.a Undertake a strategic landscape assessment of the whole Cherwell catchment	NRA ¹ LAS	■	■				10-50	To enhance baseline information on the landscape of the Cherwell catchment, to identify the issues affecting it and to plan and prioritise appropriate action to deal with them
10.b Undertake a detailed landscape survey of the Cherwell in Banbury to identify possible enhancement opportunities. Verify past studies by BW and Cherwell DC	NRA ¹	■	■				<10	NRA looking for collaborative funding
10.c Geomorphological assessment of the Cherwell catchment	NRA ¹	■					<10	

ISSUE 11: LOW FISH POPULATIONS IN THE RIVER CHERWELL BETWEEN BANBURY AND LOWER HEYFORD

Recent fish surveys have revealed a significant decline in the fish populations in the River Cherwell between Banbury and Lower Heyford.

Activity	Lead/ Key	96/97	97/98	98/99	99/2000	2000/on	Cost (£k)	Comments
11.a Investigate the cause of the low fish populations in the River Cherwell	NRA ^{1,2,3}	■					10-50	Some overlap with issues 1,3 and 9.f

General Activities

This section of the Action Plan describes those activities which have not been prompted by the issues raised during the consultation period but are nonetheless considered to be important in order to safeguard and improve the water environment. The NRA will take full account of the relative importance of these activities to the issue-related activities when deciding annually how to allocate available resources. The 'general activities' have been grouped under four main headings. This should facilitate the incorporation of these activities in the NRA's annual work programme and the production of its annual cross functional plans.

Table 1 MONITORING (*describe resource*)

Includes: sampling/survey programmes and any other data collection, modelling, analysis of data, compiling inventories.

Table 2 REGULATION & ENFORCEMENT (*safeguard resource*)

Includes: issuing of licences such as abstraction licences and rod licences and indirect regulation such as responding to planning applications.

Table 3 OPERATIONS (*maintain resource*)

Includes: emergency actions and reactions, promotion and advisory services eg. pollution prevention, river maintenance.

Table 4 IMPROVEMENTS (*enhance resource*)

Includes: enhancement schemes and improvement of degraded areas.

The general activities contained in the following tables have been numbered using the initials of the main headings; eg. M.1, M.2 etc for Monitoring; R.1, R.2 for Regulation and Enforcement etc.



River Cherwell at Nell Bridge, Adderbury

TABLE 1: MONITORING

Activity	Lead/ Key	96/97	97/98	98/99	99/2000	2000/on	Cost (&k)	Comments
M.1 Biological monitoring of river habitat enhancement schemes	NRA ²	■	■	■	■	■	<10 pa	Ongoing, planned around enhancement scheme schedules
M.2 Assessment of the catchment and production of flood maps in connection with Section 105 surveys	NRA ^{8,9}	■	■	■	■	■	50-100	
M.3 Undertake Phase I and Phase II floodplain habitat surveys	EN, LAS, County Wildlife Trusts, NRA ⁷	■	■	■			n-avail	
M.4 Multi-functional study to address issues on Oxford's watercourses	NRA ^{1,2,4,6,8,9,10}	■	■	■	■		n-avail	
M.5 Water quality sampling (manual and automatic)	NRA ^{1,2}	■	■	■	■	■	n-avail	Ongoing statutory duty done in line with national policy
M.6 Routine biological monitoring and data analysis	NRA ²	■	■	■	■	■	<10 pa	Annual programme
M.7 Groundwater quality monitoring network	NRA ^{1,2}	■	■	■	■	■	<10	Ongoing obligation in line with national policy
M.8 Biological survey to assess nutrient status of Langford Brook for UW/WTID	NRA ²	■					<10	
M.9 River Cherwell fishery survey	NRA ⁷	■					10-50	Estimated 200km, 40 sites
M.10 Monitor fishery enhancement schemes upstream and downstream of Banbury	NRA ^{7,2}	■	■	■	■	■	n-avail	
M.11 Respond effectively to individual planning applications and development proposals in River Cherwell catchment	NRA ⁹	■	■	■	■	■	10-50	To ensure that NRA's aims to protect and improve the water environment are achieved
M.12 Promotion of guidance notes for Local Planning Authorities for incorporation into statutory plans	NRA ⁹	■	■	■	■	■	10-50	To ensure adequate environmental safeguards are written into plans to facilitate development control
M.13 Over the coming year identify ecological targets for key species and habitats within the Cherwell catchment	RSPB, NRA ^{7,2} , EN, BBONT, Upper Thames ESA, LAS	■					n-avail	

TABLE 1: MONITORING

Activity	Lead/ Key	96/97	97/98	98/99	99/2000	2000/on	Cost (£k)	Comments
M.14 Measure and monitor rainfall, groundwater levels, river levels and flow for operational response and flood warning	NRA ^{1,6}	■	■	■	■	■	n-avail	Ongoing
M.15 Install an additional flow gauging station on the River Cherwell at Oxford	NRA ⁵	■					>100	
M.16 Research, collect and collate data on existing water recreation and sports provisions and deficiencies in the catchment	NRA ⁷ , Sports Council, LA(CDC)	■	■				<10	Work being carried out as part of/extension to River Thames Recreation Strategy project data base
M.17 Use existing NRA River Corridor Survey of Cherwell and Ray to assess comparative conservation status of the river corridor within the CMP area and to help in the prioritisation of enhancement schemes and regulatory activities	NRA ⁷	■	■	■			n-avail	
M.18 Monitor status and distribution of native and non-native crayfish in the catchment and investigate potential protection measures, such as control of crayfish farming operations and their location vis-a-vis designation of no-go areas. Consider the need for a pro-active survey to establish current distribution	MAFF, NRA ^{2,7}	■	■				<10	
M.19 Assess compliance of river quality with objectives	NRA ¹	■	■	■	■	■	n-avail	Continuous
M.20 Assess compliance of discharges with consent standards	NRA ¹	■	■	■	■	■	n-avail	Continuous
M.21 Assess reasons for changes of chemical quality grades of rivers	NRA ^{1,2}	■	■	■	■	■	n-avail	Annual
M.22 Water quality modelling of rivers and discharges where necessary	NRA ^{1,2}	■	■	■	■	■	n-avail	Continuous

TABLE 2: REGULATION AND ENFORCEMENT

Activity	Lead/ Key	96/97	97/98	98/99	99/2000	2000/on	Cost (£k)	Comments
R.1 Enforce Land Drainage Byelaws	NRA ^{8,9}	■	■	■	■	■	n-avail	Landowner awareness of byelaws and provision of Water Resources Acts. Guidance on policy and training also required internally
R.2 Enforce Salmon and Freshwater Fisheries Act 1975 and Fisheries Byelaws including issuing of consents and licence checking	NRA ⁷	■	■	■	■	■	n-avail	Ongoing activities
R.3 Ensure NRA's input to mineral planning applications in the catchment protects the existing ecological resource and promotes, where appropriate, restoration to wetland habitats	NRA ^{9,7} , LAS, EN, MAFF	■	■	■	■	■	n-avail	Restoration to wetland habitats can provide habitat mosaics which will increase the biodiversity of the catchment
R.4 Continue and improve functional input to planning consultation procedures in order to meet aims of conserving the present ecological resource of the water environment and pursue opportunities for habitat enhancement through the planning process	NRA ^{7,2}	■	■	■	■	■	n-avail	Routine ongoing activity
R.5 Prepare an area specific study of the Upper Heyford site to influence future development and highlight any constraints	NRA ⁹	■					<10	
R.6 Respond to Waste Management Licences	NRA ^{1,3}	■	■	■	■	■	<10	Ongoing activity
R.7 License abstractors to protect the water environment	NRA ⁵	■	■	■	■	■	<10	Ongoing

TABLE 2: REGULATION AND ENFORCEMENT

Activity	Lead/ Key	96/97	97/98	98/99	99/2000	2000/on	Cost (£k)	Comments
R.8 Enforce abstraction licences to ensure compliance with licence conditions	NRA ¹ , abstractors	■	■	■	■	■	<10	Ongoing
R.9 Liaise with LPAs to support NRA planning guidance and to ensure sustainable development	NRA ⁹ , LAs	■	■	■	■	■	<10	
R.10 Continue an integrated multi-disciplinary input to NRA regulatory activities in (i) water abstractions - to ensure protection of river flows, aquifers and water-dependent habitats, (ii) land drainage consents - to protect river and riparian habitats and promote sensitive engineering methods, and (iii) discharge consents - to identify threats and protect controlled waters and water-dependent habitats	NRA ^{1,3,4,5,7,8,9}	■	■	■	■	■	10-50	
R.11 Regulate crayfish farming to protect native populations	MAFF, NRA ⁷	■	■	■	■	■	<10	
R.12 Ensure protection from adverse effects for the valuable brown trout and invertebrate communities on the upper tributaries of the Cherwell	NRA ^{7,8}	■	■	■	■	■	n-avail	Protect, and wherever possible improve habitat, water flows and water quality
R.13 Designate sensitive areas under UW/WTID	MAFF, NRA ²	■					n-avail	Biological and chemical surveys
R.14 Enforce Pollution Control legislation	NRA ^{1,2,3}	■	■	■	■	■	n-avail	Ongoing statutory requirement

TABLE 3: OPERATIONS

Activity	Lead/ Key	96/97	97/98	98/99	99/2000	2000/on	Cost (£k)	Comments
O.1 General river maintenance to maintain flood flow capacities related to the appropriate standard of service for main rivers	NRA ⁸	■	■	■	■		>100 pa	
O.2 Emergency fisheries response capability including aeration and fish rescues	NRA ⁷	■	■	■	■	■	10-50	Ongoing activities
O.3 Emergency flood responses	NRA ⁸	■	■	■	■	■	50-100 pa	Patrolling during floods. Assistance to Local Authorities, etc
O.4 Provide a flood warning service to allow individuals to mitigate the effects of flooding through sandbagging, moving furniture, etc	NRA ⁸	■	■	■	■	■	n-avail	To provide a service - issuing warnings
O.5 River Control Structures Survey	NRA ^{8,11}	■	■	■			10-50	Identify ownership, condition, levels, etc. Valuable input into Section 105 Surveys, WLMP and FDMM
O.6 Consider extending the existing flood warning system to the upper reaches of the River Cherwell and tributaries	NRA ⁸	■					10-50	To be decided in light of the NRA's new responsibilities
O.7 Provide ecological advisory services, including fisheries management advice and assistance	NRA ⁷	■	■	■			10-50	Routine ongoing activity. Applies to both rivers and still waters

TABLE 3: OPERATIONS

Activity	Lead/ Key	96/97	97/98	98/99	99/2000	2000/on	Cost (£k)	Comments
O.8 Continue input to river maintenance activities to ensure compliance with conservation guidelines for good practice, improving input to trimming and weedcutting practices. Ensure progression of FIDMM methodology reflects changes in land-use to greater extensification and reflects need to protect ecological resources including floodplain habitats dependent on flooding	NRA ^{7,8} - in consultation with EN, other environmental organisations	■	■	■	■	■	10-50	
O.9 Biological assessment of pollution incidents and chronic pollution problems	NRA ^{2,1}	■	■	■	■	■	<10 pa	Ongoing
O.10 Maintain contact with anglers, eg Upper Thames Fisheries Consultative Newscast magazine, PR	NRA ⁷ , UTFC	■	■	■			<10	Routine ongoing activity
O.11 Promote schemes/ collaborative projects which serve to provide agricultural extensification to flood plain, buffer zones to rivers, habitat enhancement and restoration, etc - eg Upper Thames Tributaries ESA, Countryside Stewardship	NRA ^{7,2} , CoCo, MAFF, ADAS, EN, etc	■	■	■	■	■	n-avail	
O.12 Respond to pollution incidents and emergencies within published response times	NRA ¹	■	■	■	■	■	n-avail	Ongoing statutory requirement
O.13 Pollution prevention activity including focused advice and guidance to industrialists and farmers. Also work in close liaison with the emergency services to avoid pollution from accidents, etc	NRA ¹ , Fire and Rescue Services, LAs	■	■	■	■	■	10-50	Ongoing rolling programme need to undertake repeated visits to maintain progress

TABLE 3: OPERATIONS

Activity	Lead/ Key	96/97	97/98	98/99	99/2000	2000/on	Cost (£k)	Comments
O.14 Implement the national 'Policy and Practice for the Protection of Groundwater'	NRA ⁷	■	■	■	■	■	n-avail	Ongoing
O.15 Ensure archaeological interests are protected during NRA activities and consultation on archaeological sites occurs as appropriate	NRA ⁷ , EH	■	■	■	■	■	n-avail	Ongoing
O.16 Promote the recreational use of water and associated land and encourage improved public access through joint ventures	NRA ¹⁰ , LAs, Landowners	■	■	■	■	■	n-avail	Part of NRA's general duty. Recreation Information Strategy developed for Thames Region as a whole. Leaflet produced with Oxford City Council and BW, promoting the waterway in Oxford
O.17 Support Sustrans National Cycle Network where practicable with the approval of LPAs and landowners on appropriate riverside sites	NRA ^{10,9} Sustrans, LAs	■	■	■	■	■	n-avail	Promotion of sustainable transport through the creation of cycle paths will make an important contribution to the quality of life
O.18 Move to Flood Defence Management Manual (FDMM) methodology for objective maintenance criteria	NRA ⁸	■	■	■			10-50	Objective is maintenance and valuable input into Section 105 surveys, WLMP. Depends on use of Section 105 data for best value for money

TABLE 4: IMPROVEMENTS

Activity	Lead/ Key	96/97	97/98	98/99	99/2000	2000/on	Cost (£k)	Comments
1.1 Remove litter from main rivers within built up areas, eg. the River Cherwell at Banbury and Oxford	NRA ⁹ , District Councils	■	■	■	■	■	10-50	The NRA is seeking joint action in the removal and disposal of litter in main river water courses with cooperation from the district councils
1.2 Enmain approximately 1km of the Bloxham Brook upstream of the main river limit	NRA ⁸	■					<10	Only maintenance cost in future
1.3 Identify remaining strongholds of water vole in CMP area and carry out measures to improve habitat as and when research information provides guidelines	NRA ⁷ , Oxford University "WILDCRU"	■	■	■			50-100	
1.4 Fishery enhancement schemes identified as a result of 1995 surveys	NRA ⁷	■	■				n-avail	Timescale will depend on budget and priorities
1.5 Work with Cherwell IDC to develop proposals resulting from the Cherwell Valley Project initiative ensuring conservation of river and riparian habitats	NRA ^{10,7} , CDC	■	■				n-avail	
1.6 Produce appropriate strategic initiatives and plans to protect and improve the recreational use of the Oxford Canal	BW, OCC, NRA ¹⁰	■	■	■	■	■	n-avail	
1.7 Continue programme of habitat enhancements to restore degraded channel and riparian habitats	NRA ⁷ , Landowners, external conservation organisations	■	■	■	■	■	10-50 pa	Rolling programme based on priority system of best deserving schemes

FUTURE REVIEW AND MONITORING

The NRA is jointly responsible, with other organisations, groups and individuals for implementing this Action Plan. Progress will be monitored on a regular basis and reported annually by the NRA in a review document to all the key partners and local authorities.

The Annual Review will:

- detail the progress achieved in carrying out the work shown in the activity plans;
- identify additional actions required in the light of changes in the catchment;
- consider the need to update the Catchment Management Plan.

The overall CMP process will usually be repeated every five years.

THANK YOU FOR YOUR INTEREST IN THE CHERWELL CATCHMENT

PLEASE LET US KNOW YOUR VIEWS AND YOUR ACTIVITIES BY CONTACTING OUR
WEST AREA CATCHMENT MANAGEMENT OFFICER

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NOTE: This is not a legally or scientifically binding document. It is written both for wide public appreciation and for information.

APPENDIX 1

RIVER QUALITY OBJECTIVES

One of the main aims of the NRA is to maintain or improve the quality of rivers by controlling water pollution. The Water Resources Act (1991) allows the government to set Statutory Water Quality Objectives (SWQOs). The objectives set will be related to the use of the water. Five such uses have been proposed. Detailed regulations have been published for one, the "River Ecosystem" use (RE), the different classes of which can be summarised as follows:

- RE1:** Water of very good quality suitable for all fish species;
- RE2:** Water of good quality suitable for all fish species;
- RE3:** Water of fair quality suitable for high class coarse fish populations;
- RE4:** Water of fair quality suitable for coarse fish populations;
- RE5:** Water of poor quality likely to limit coarse fish populations.

The timetable for the setting of SWQOs is largely in the hands of the Government. In readiness, the NRA has derived non-statutory River Quality Objectives (RQOs) expressed as RE classes for the rivers within the Region.

The table below shows the proposed non-statutory River Quality Objectives (RQOs) for all the watercourses in the Cherwell catchment together with their target dates for achievement. The RQOs without dates are targets which should already have been met. Those with dates require improvements in discharge quality, or other factors governing river quality, to ensure compliance by the given date.

It may be possible to identify a clear need for further water quality improvements on a reach by reach basis. In each case the NRA will investigate ways of improving water quality. It will then appraise the cost and benefits. If a need for improvement is agreed, a long term RQO will be set and funding secured to achieve the objective. To date long term objectives have not been set for the Cherwell. A public view on the need for water quality improvements would help in this process.

WATERCOURSE	REACH	LENGTH km	RQO
ASHBY BROOK	Moreton Brook - Cherwell	7.0	RE2
AUDLEY BROOK	Stratton Audley STW - Langford Brook	1.3	RE4
BLETCHINGDON BROOK	Bletchington - Gallos Brook	3.5	RE2 (2006)
BLOXHAM BROOK	Milcombe - Sor Brook	7.8	RE2 (2006)
BODDINGTON CANAL FEED	Boddington Res - Oxford Canal	5.4	RE4
BYFIELD BROOK	Westthorp - Cherwell	3.5	RE3 (2006)
CHACOMBE BROOK	Chacombe STW - Cherwell	3.2	RE3
CHERWELL	Source - Banbury Water Intake	34.0	RE2 (2001)
CHERWELL	Banbury Water Intake - Banbury STW	3.1	RE3
CHERWELL	Banbury STW - Kings Sutton Stream	7.3	RE4
CHERWELL	Kings Sutton Stream - Somerton Bridge	9.4	RE3

WATERCOURSE	REACH	LENGTH km	RQO
CHERWELL	Somerton Bridge - Oxford Canal (middle)	19.6	RE2
CHERWELL	Oxford Canal (middle) - Ray (Oxon)	10.7	RE2
CHERWELL	Ray (Oxon) - Thames	12.4	RE3
CROUGHTON BROOK	Source - Ockley Brook	4.0	RE2
CULWORTH BROOK	Thorpe Mandeville - Cherwell	4.3	RE2
DEDDINGTON BROOK	Source - Cherwell	16.1	RE3
FARNBOROUGH DITCH	Avon Dassett - Hanwell Brook	3.1	RE2
FARTHINGHOE STREAM	Marston St Lawrence - Cherwell	10.1	RE4
GALLOS BROOK	Caulcott - Ray (Oxon)	13.7	RE2 (2006)
GUBBINSHOLE DITCH	Source - Ray (Oxon)	4.4	RE4
HANWELL BROOK	Avon Dassett - Oxford Canal	14.0	RE3
HIGHFURLONG BROOK	Priors Marston STW - Cherwell	13.8	RE3
HOOK NORTON BROOK	Source - Swere	5.6	RE2
HORNTON STREAM	Hornton - Sor Brook	3.7	RE2
KINGS SUTTON STREAM	Upper Astrop - Cherwell	2.8	RE4
LANGFORD BROOK	Stratton Audley - Bicester STW	6.6	RE3
LANGFORD BROOK	Bicester STW - Ray	5.4	RE4 (1996)
LAUNTON BROOK	Poundon Hill - Cutters Brook	4.6	RE4 (2006)
LEYS FARM DITCH	Upper Heyford - Gallos Brook	6.0	RE3
LUDGERSHALL BROOK	Ludgershall - Ray (Oxon)	3.0	RE4
OCKLEY BROOK	Source - Cherwell	6.8	RE2
OXFORD CANAL (UPPER)	Alcan Intake - Cherwell at Aynho cross over	11.8	RE3
OXFORD CANAL(UPPER)	Fenny Compton - Boddington Canal Feeder	2.5	RE4
OXFORD CANAL (UPPER)	Boddington Canal Feeder - Alcan Intake	10.5	RE4
OXFORD CANAL (MIDDLE)	Aynho Weir Lock - Cherwell at Bakers Lock	20.6	RE3
RAY (OXON)	Source - Grendon Underwood STW	7.7	RE4
RAY (OXON)	Grendon Underwood STW - Langford Brook	16.8	RE4
RAY (OXON)	Langford Brook - Gallos Brook	6.6	RE4
RAY (OXON)	Gallos Brook - Cherwell	0.8	RE4
SOR BROOK	Source - Bloxham Brook	22.7	RE2
SOR BROOK	Bloxham Brook - Cherwell	5.0	RE2
SUMMERSTOWN DITCH	Summerstown - Cutters Brook (Ray)	2.4	RE5
SWERE	Source - Barford St Michael STW	17.5	RE2
SWERE	Barford St Michael STW - Cherwell	7.4	RE2
TRAMROAD DITCH	Gipsy Bottom - Wootton Brook (Ray)	3.4	RE4

GENERAL QUALITY ASSESSMENT (GQA)

As well as taking decisions on measures to maintain or improve river quality, the NRA also publishes the results from regular surveys of the quality of rivers and canals in England and Wales. The NRA believes that it is important to know whether quality is getting better or worse.

In order to provide a comprehensive picture of the quality of our rivers, different aspects of the water environment will be looked at. The NRA refers to these different aspects as 'windows' because each offers a different perspective on the overall health of the river. A GQA scheme comprising windows for **Chemistry, Biology, Nutrients and Aesthetics** is being developed.

- The **Chemistry GQA Window** has already been produced. It comprises six water quality grades reflecting differing degrees of pollution. These grades are a sub-set of the standards in the river ecosystem scheme. The chemistry GQA grades can be summarised as follows:

A		Good
B		
C		Fair
D		
E		Poor
F		
		Bad

Chemistry data collected for 1990-1992 has been reported using the GQA scheme, and are documented in *The Quality of Rivers and Canals in England and Wales (1990 to 1992)*, Water Quality Series Report No.19, which can be obtained from Her Majesty's Stationery Office (HMSO).

- The **Biology GQA Window** is close to completion. It will assess the health of river stretches based upon the diversity of tiny animals living on or in the river bed.

- The **Nutrient GQA Window** is under development. This will take account of the concentration of certain nutrients in rivers, eg nitrogen and phosphorus. Nutrients are simple chemical substances used by plant life. High concentrations may cause excessive plant growth, such as algal blooms.
- The **Aesthetics GQA Window** is under development. This is being developed to address the issue of public perception of water quality, which is influenced largely by its visual appearance and odour. Sometimes, the appearance of the water may indicate pollution, such as the presence of litter (eg sewage-derived). In other cases, visually unpleasant sights such as foaming or scums may result from natural causes.

APPENDIX 2

ENVIRONMENTAL OBJECTIVES

The following environmental objectives were identified in the Consultation Report. These are proposed objectives for the NRA and others to follow as they continue their work. Although they are in sympathy with published NRA aims and strategies, these objectives are not statements of NRA "policies". It is envisaged that the actions set out in the activity plans will go some way to meeting these objectives.

Nature Conservation

To advise, assist and facilitate the objectives of the Upper Thames Tributaries ESA scheme with the emphasis on restoring wetland habitats to the benefit of breeding and wintering birds.

To produce Water Level Management Plans (WLMPs) for all water-dependent SSSIs in the catchment area.

To promote the conservation of all aquatic life and associated non-aquatic organisms in the river corridor, and to protect the integrity of all habitats of nature conservation value.

To carry out channel and riparian enhancement schemes on currently degraded reaches and river corridors.

Landscape

To safeguard the special landscape interest of designated sites including the Cotswold AONB.

To protect and conserve highly valued river landscapes and enhance degraded river landscapes.

To carry out a landscape assessment of the Cherwell catchment according to NRA methodology.

Heritage

To protect and conserve the archaeological and heritage interest of relevant sites within the river corridor.

Amenity and Recreation

To maintain and enhance water quality, river flow and channel characteristics for the provision of water-based recreation.

To protect and promote all suitable water-related recreational uses.

To improve recreational access, where possible, and ensure it is appropriate to the river environment in the Cherwell catchment.

Fisheries

To promote a productive, diverse and sustainable fish population within the catchment.

To identify and address physical, chemical and biological factors preventing the achievement of the above.

To safeguard and maintain the water quality of all designated fisheries.

Navigation

To maintain or improve water resources and physical characteristics in the catchment in conjunction with British Waterways to sustain the Oxford Canal.

Water Abstraction

To manage water resources to achieve an acceptable balance between the needs of the environment and those of the abstractors.

To ensure that licence holders understand and comply with the terms and conditions of the licences.

To ensure that abstraction does not cause any deterioration of water quality.

Effluent Disposal

To regulate the discharge of effluent to the water environment so as to ensure that water quality objectives are achieved, and that nature conservation, fisheries and recreation interests are not compromised.

To ensure that outfalls are located so as to achieve good effluent mixing within the river.

Rural Land Use

To influence future rural development in order to protect the water environment and minimise the risk of flooding.

To seek enhancements to the water environment through rural development and countryside initiatives.

Urban Land Use

To influence future urban development in order to protect the water environment and minimise the risk of flooding.

To seek enhancements to the water environment through urban development and redevelopment.

To ensure that the necessary infrastructure required for urban developments is provided in advance of its need and in such a way that the water environment is not compromised.

Mineral Extraction and Solid Waste Disposal

To provide high quality advice and information concerning the water environment so as to influence the formulation of national and local minerals policies and minerals planning decisions.

To ensure the sustainable use of resources whilst protecting the conservation value of the catchment and maximising the potential for enhancement.

To exercise control to ensure that waste disposal activities do not adversely affect the water environment.

Flood Defence

To continue weedcutting, dredging and other minor channel works as necessary to minimise flood risk whilst ensuring that conservation guidelines for good working practice are followed and thus ensure environmental sensitivity during river management operations.

To continue to provide an effective emergency response service during floods.

To implement the Flood Defence Management Manual and the associated Standards of Service in the Cherwell catchment.

To improve arrangements for flood forecasting and warning.

To continue to disseminate information on flooding and flood protection measures to local authorities and inform interested bodies.

To investigate opportunities for source control using a multi-functional group within the NRA.

To improve the operation of the River Ray weirs through automation.

To identify needs for capital investment to alleviate flooding.

APPENDIX 3

CONTACT TELEPHONE NUMBERS

1. Environmental Services - Pollution Control (West)	John Haines	01734 533366
2. Regional Scientific Department	Derek Tinsley	01734 535273
3. Environmental Services - Groundwater Quality (West)	Sheena Engineer	01734 533375
4. Environmental Services - Water Resources (West)	Cathy Glenny	01734 535909
5. Regional Technical Department - Water Resources	Brian Arkell	01734 535387
6. Regional Technical Department - Hydrological and Hydrometric Services	Brian Greenfield	01734 535320
7. Fisheries and Conservation (West)	John Sutton	01734 533353
8. Flood Defence (West)	John Dora	01734 533381
9. Catchment Planning (West)	Jamal A Hamid	01734 533304
10. Navigation and Recreation (West)	Eileen McKeever	01734 533308
11. Thames Engineering Group	Nick Lyness	01734 533325
12. Regional Technical Department - Flood Defence	Dave Rylands	01734 535752

APPENDIX 4

KEY TO ACTION PLAN PARTICIPANTS

<i>ADAS</i>	Agricultural Development & Advisory Service
<i>BBONT</i>	Berkshire, Buckinghamshire and Oxfordshire Naturalist Trust
<i>BW</i>	British Waterways
<i>CDC</i>	Cherwell District Council
<i>DoT</i>	Department of Transport
<i>EH</i>	English Heritage
<i>EN</i>	English Nature
<i>FINCAG</i>	Flooding in the Cherwell Action Group
<i>LA</i>	Local Authority
<i>MAFF</i>	Ministry of Agriculture, Fisheries and Food
<i>NRA</i>	National Rivers Authority
<i>NRA TR</i>	National Rivers Authority - Thames Region
<i>OCC</i>	Oxfordshire County Council
<i>OFWAT</i>	Office of Water Services
<i>RSPB</i>	Royal Society for the Protection of Birds
<i>SUSTRANS</i>	An organisation which promotes sustainable transport for all, primarily through the use of cycling and the creation of cycle paths
<i>TWUL</i>	Thames Water Utilities Ltd
<i>UTFC</i>	Upper Thames Fisheries Consultative
<i>WILDCRU</i>	Wildlife Conservation Research Unit

APPENDIX 5

GENERAL GLOSSARY

<i>AONB</i>	Area of Outstanding Natural Beauty as designated by the Countryside Commission.
<i>Abstraction</i>	Removal of water from surface or groundwater, usually by pumping.
<i>Abstraction Licence</i>	Licence issued by the NRA under Section 38 of the Water Resources Act 1991 to permit water to be abstracted. The maximum abstraction rates are specified in the licence.
<i>Aquifer</i>	A layer of underground porous rock which contains water and allows water to flow through it.
<i>Biodiversity</i>	A mixture of habitats and species which increases the ecological value of a site.
<i>BMWP</i>	Biological Monitoring Working Party.
<i>CMP</i>	Catchment Management Plan - integrated plans for the catchment which cover all the functions of the NRA. These provide the strategy by which the catchments will be managed.
<i>Catchment</i>	Area bounded by watershed from which river systems, lakes and reservoirs collect water.
<i>Confluence</i>	The point at which two rivers meet.
<i>Consent</i>	The statutory document issued by NRA under schedule 10 of the Water Resources Act 1991 to impose any limits and conditions on the discharge of an effluent to a controlled water.
<i>County Structure Plans</i>	Statutory documents produced by County Councils (CC) outlining their strategy for development over a 10-15 year timescale.
<i>Directive</i>	A type of legislation issued by the European Community which is binding on the member states.
<i>EA</i>	Environmental Assessment.
<i>EC</i>	European Commission (European Union, EU).
<i>ESA</i>	Environmentally Sensitive Area.
<i>FDMM</i>	Flood Defence Management Manual.
<i>Flood plain</i>	This includes all land (and washlands) adjacent to a watercourse over which water flows, or would flow but for flood defences, in times of flood.
<i>Groundwater</i>	Underground water contained in the pores and fissures of aquifers (water-bearing strata).
<i>GQA</i>	General Quality Assessment.
<i>Invertebrate Fauna</i>	Animals which lack a vertebral column - used for biological classification. Especially macroinvertebrates (animals of sufficient size to be retained in a net with a specified mesh size).
<i>LA</i>	Local Authority.
<i>Landfill</i>	Site used for waste disposal into/onto land.
<i>MAFF</i>	Ministry of Agriculture, Fisheries and Food.
<i>MoD</i>	Ministry of Defence.

<i>Main River</i>	Some watercourses are designated as "Main River" - this status must first be approved by MAFF. The NRA has the power to carry out works to improve drainage or protect land and property against flooding on such rivers and the power to control works that landowners and others may wish to undertake.
<i>NRA-TR</i>	National Rivers Authority - Thames Region.
<i>NVZ</i>	Nitrate Vulnerable Zone.
<i>p a</i>	Per annum.
<i>Riparian Owner</i>	A person/organisation with property rights on a river bank.
<i>River Corridor</i>	Of particular importance to the NRA, such a corridor is a continuous, linear area of land running either side of a watercourse which has visual, physical or ecological links to a watercourse and whose value is dependent on the quality or level of water within the channel.
<i>River Quality Objective (RQO)</i>	The standard of water quality that a river should achieve in order to be suitable for agreed uses.
<i>STW</i>	Sewage Treatment Works.
<i>SWQO</i>	Statutory Water Quality Objectives set by the Secretary of State, in relation to controlled waters.
<i>Section 105 Surveys</i>	These are surveys and studies being carried out by the NRA under the Water Resources Act 1991 in connection with DoE circular 30/92 and the Memorandum of Understanding with local planning authorities. The aim is to provide a better understanding of the flooding mechanism, risk and extent of flood plains.
<i>Set-aside</i>	Temporary withdrawal of agricultural land from agricultural production.
<i>Site of Special Scientific Interest (SSSI)</i>	A site given a statutory designation by English Nature because it is particularly important on account of its conservation value.
<i>Source Control</i>	A collective term to describe the management of surface water run-off at or near the point of impact of rainfall and before it reaches the traditional piped drainage and sewer systems of urban areas.
<i>Springs</i>	Natural emergence of groundwater at the surface.
<i>Sustainable</i>	Capable of being maintained at a steady state without exhausting natural resources or causing ecological damage.
<i>Sustainable Development</i>	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
<i>USAF</i>	United States Air Force.
<i>UWWTD</i>	Urban Wastewater Treatment Directive.
<i>WLMP</i>	Water Level Management Plans.
<i>Watercourse</i>	A stream, river, canal or the channel, bed or route along which they flow.
<i>WTW</i>	Water Treatment Works.

APPENDIX 6

ORGANISATIONS RESPONDING TO THE CONSULTATION REPORT

21 individuals and:

Aylesbury Vale District Council	Ministry of Agriculture, Fisheries and Food (MAFF)
Banbury and District Angling Association	National Farmers Union (East Midlands Region)
Bicester Friends of the Earth	National Farmers Union (Central Region)
Bodicote Parish Council	Northamptonshire County Council
British Waterways	Oxford City Council
Broughton Parish Council	Oxford Friends of the Earth
Buckinghamshire County Council	Oxford Ornithological Society
Cherwell District Council	Oxford Urban Wildlife Group
Cherwell Otter Habitat Project	Oxfordshire County Council
Clean Rivers Trust	Railtrack Property
Daventry District Council	Royal Society for the Protection of Birds
English Heritage	Sand and Gravel Association
English Nature	South Oxfordshire District Council
Edgcott Parish Council	Sports Council (East Midlands Region)
Farming and Wildlife Advisory Group (FWAG)	Sports Council (West Midlands Region)
Flooding in Cherwell Action Group (FINCAG)	Swalcliffe Parish Council
Gosford and Water Eaton Parish Council	Thames Water Utilities Ltd
Government Office for the East Midlands	The University of Buckingham
Government Office for the South East	The University of Oxford
HM Inspectorate of Pollution (Southern Region)	Warwickshire County Council
Kidlington Angling Society	Warwickshire Wildlife Trust
Lower Heyford Parish Council	Woodford-Cum-Membris Parish Council

NOTES

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