

THE WANDLE, BEVERLEY BROOK, HOGSMILL CATCHMENT MANAGEMENT PLAN ACTION PLAN



NRA

National Rivers Authority

*Thames Region
July 1995*

KEY CATCHMENT STATISTICS

GENERAL

Population (approximate)	985 000
Catchment area	339 sq. km
Urban/suburban area	132 sq. km (39%)

WATER RESOURCES

Average annual rainfall	694 mm
Average flow	
(River Wandle)	143 Ml/d
(Beverley Brook)	47 Ml/d
(Hogsmill River)	84 Ml/d
Total licensed groundwater abstraction	240 Ml/d (estimate)

WATER QUALITY (GQA 1991-1993; see Appendix B)

River length	Class A	0 km
	Class B	1.8 km (3%)
	Class C	14.1 km (32%)
	Class D	14.5 km (33%)
	Class E	11.7 km (26%)
	Class F	2.4 km (6%)

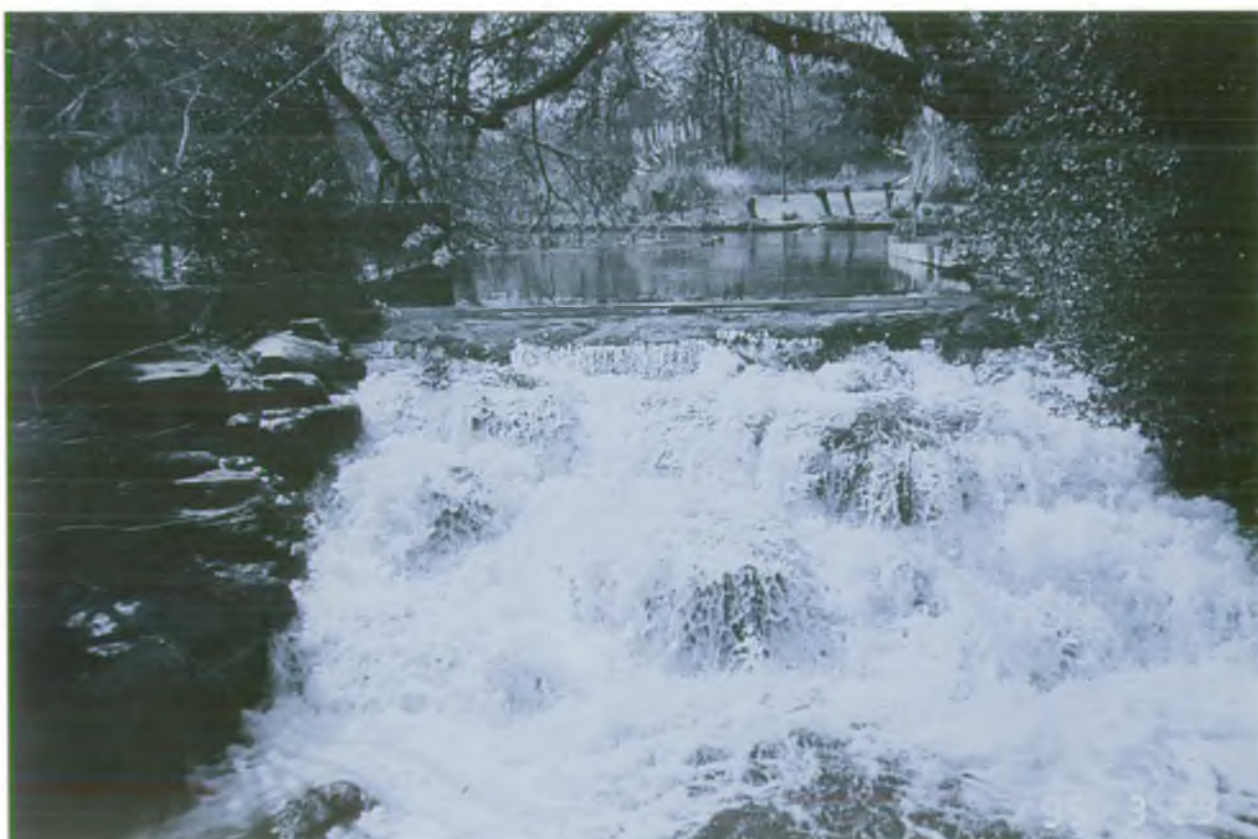
Length of EC designated cyprinid fishery (Wandle) 6.6 km

FLOOD DEFENCE

Length of statutory main river (Wandle)	26.7 km
(Beverley Brook)	23.1 km
(Hogsmill)	9.5 km

Catchment area at risk from flooding once every 50 years
(observed & predicted) 5.0 sq. km

*The Upper
Mill Grove
Park bypass
weir on the
River Wandle*



CATCHMENT OVERVIEW

National Rivers Authority Thames Region



KEY

	Catchment Management Plan Area
	River Catchment Boundary
	Local Authority Boundary
	Wimbledon Park Lake
	Watercourses

- | | |
|-----------------------|------------------------------|
| 1. Tolworth Brook | 8. Pyl Brook |
| 2. Bonesgate Stream | 9. River Graveney |
| 3. Horton Stream | 10. Norbury Brook |
| 4. Ewell Court Stream | 11. Beddington Corner Branch |
| 5. Green Lanes Stream | 12. Carshalton Branch |
| 6. Coombe Brook | 13. Croydon Branch |
| 7. East Pyl Brook | 14. Flood Relief Channel |

Scale (approx)

0 5km

FOREWORD

The integrated management of river catchments is a fundamental philosophy for the NRA, and Catchment Management Plans (CMPs) are fundamental to integrated river management.

Catchment Planning is a relatively new concept but CMPs are rapidly becoming one of the cornerstones of the NRAs corporate business planning process. They are important for this reason, but also because they are a public representation of our commitment to integrated catchment management. CMPs also demonstrate our accountability to the communities in which we are working; who are our customers.

This Action Plan, its vision and the activities it contains, are the result of a working partnership between the NRA and the numerous organisations, groups and individuals who have expressed their interest in these river catchments. The enthusiasm, effort and support of all those who have contributed has been inspirational: the NRA could not have done it alone. As the new millennium approaches this partnership approach links in well with Local Agenda 21 initiatives, in which the NRA itself is keen to be involved. The vision for these catchments is, by its nature, not constrained by practicalities of budgets and resources. The 5 year activity plan, however, sets out firm proposals for the delivery of real, sustainable,

improvements to the local water environment as the first steps towards that vision. Inevitably, some cherished aspirations - ours and other peoples do not feature in the initial 5 year plan. This does not mean that they have been forgotten and they certainly have not been rejected. The annual review process for CMPs and their full 5-yearly update, will ensure that further actions are programmed as opportunities and resources, become available.

These rivers are an important part of our heritage and they must be maintained and improved for the enjoyment of future generations. This Catchment Management Plan provides a blueprint for the future and one which the NRA, in partnership with the local population, will use to ensure that continuing improvement to the local water environment is achieved, and that progress towards the vision is maintained.

Adrian Britts

Area Manager, Thames S.E.



Photo
Front cover:
Weir at
Morden Hall
Park.
Courtesy of
National
Trust

Spring fed
Carsballon
ponds at
River Wandle
SOURCE

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ENVIRONMENT AGENCY



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1. CATCHMENT VISION

Our vision is to achieve and maintain an improved state of well-being for the Wandle, Beverley Brook and Hogsmill river catchments by working in partnership with all interested parties to resolve increasingly conflicting demands on water uses.

Such a vision can only be realised through active community participation in an adaptive catchment management process that embraces the principles of environmentally sustainable action.

This approach is essential given the unique characteristics of the Wandle, Beverley Brook and Hogsmill river catchments. The range of pressures resulting from intense urbanisation in terms of floodplain encroachment, water usage, effluent disposal and demand for water related recreation must be balanced against the need to protect and enhance the diverse ecology, industrial/archaeological heritage and landscape associated with the local water environment.

The identification through the public consultation process of a series of objectives for the catchment form the bridge between co-ordinated short term actions, as set out in the Activity Plan (see Section 6), and our long term vision for the catchment.

These key strategic objectives are to;

1. maintain and improve surface and groundwater quality throughout the catchment;
2. protect low flows from further reduction and investigate alleviation;
3. integrate the management of environmentally sensitive flood defence works with the control of surface water runoff;
4. protect and enhance permanent water bodies throughout the catchment;
5. improve management techniques for instream and bankside riverine habitats;
6. seek to minimise the environmental impact of water control structures;
7. balance the needs between the recreation and conservation uses of rivers and stillwaters;
8. maintain and improve the fisheries status of rivers within the catchment;
9. promote community pride in the local water environment.



*Beverley
Brook at
Richmond
Park*

INTRODUCTION

THE CONCEPT OF 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 will inevitably come into conflict with one another. The National Rivers Authority is the major manager of the water environment in England and Wales and has the responsibility to reconcile conflicts between water users. Our Mission Statement expresses the following principles:

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, groundwaters, estuaries and coastal waters. We will be businesslike, efficient and caring towards our employees.

We have chosen to use the Catchment Management Planning Process to translate these principles into action. The Consultation Report and the Action Plan describe our vision for each catchment, identify issues and promote actions that may be taken to resolve them. The plans also provide the means of promoting two key aspects of environmental management - sustainable development (see Section 5) and water quality objectives. This Action Plan primarily covers the 5 year period 1995 - 2000 and will be reviewed annually.

Angling on
Wimbledon
Park Lake



NRA
Electrofishing
on the
Greenlanes
Stream,
Hogsmill
River

WATER QUALITY OBJECTIVES

The NRA is a public body whose function is to protect the water environment. One of our aims is to maintain or improve the quality of rivers by controlling water pollution. The NRA has set water quality targets for all rivers. These targets are known as River Quality Objectives (RQOs). They are used for planning the maintenance and improvement of river quality. RQOs establish a defined level of protection for aquatic life. Achieving these will help to sustain the use of rivers for recreation, fisheries and wildlife, and protect the interest of abstractors. RQOs provide a basis for setting Consents to discharge effluent into rivers and guide decisions on the NRA's other actions to control and prevent pollution. The water quality classification scheme used to set RQO planning targets is known as the River Ecosystem (RE) scheme. Further details on this scheme and RE targets for river reaches within the Wandle, Beverley Brook and Hogsmill catchment are given in Appendix A. Currently, 30.4 kms (69%) of river within the catchment achieves its RQO and TWUL investment over the 5 year lifespan of this CMP will ensure 100% compliance by 2000.

The NRA also makes periodic assessments of the quality of rivers in order to report trends over time and across England and Wales. The classification scheme used to report these assessments is known as General Quality Assessment (GQA). Further details are given in Appendix B. Together, the River Ecosystem scheme and General Quality Assessment replace the National Water Council (NWC) scheme.

3. REVIEW OF THE CONSULTATION PROCESS

The Wandle, Beverley Brook, Hogsmill CMP Consultation Report was launched on the 14th of November 1994 and the formal consultation period ended on the 31st of January 1995. 107 (60% of the consultees) responded, 62% of these within the consultation period. All written responses received were logged onto a database and acknowledgement letters were posted within 3 days of receipt of correspondence. The responses were then read in detail and cross referenced against the issues/options raised in the Consultation Report and additional comments recorded. All responses received provided an invaluable contribution to the formulation of the Action Plan for this CMP.

A copy of the "Report on Public Consultation" for this CMP can be obtained by writing to the address given in Section 7.

Of the 500 Consultation Reports published, 392 were distributed to consultees, 51 to internal NRA staff and 57 to colleges and central/branch/mobile libraries throughout the catchment. 5000 Summary Booklets and 60 colour posters were similarly distributed. In summary the consultation process confirmed:

1. poor water quality downstream of sewage treatment works (Issue 1), the impact of development proposals on groundwater resources (Issue 10) and conflict between recreation and conservation uses of the local water environment (Issue 26) were of most concern to consultees;

2. the need to consider 3 new catchment issues; to protect the archaeological value of rivers and riverbanks; to assess the environmental impact of the turbine on the River Wandle and to maximise fishery potential;

3. a natural grouping of the 33 issues identified in the Consultation Report into 9 strategic objectives for the CMP;

4. 32 additional activities to be completed within the 5 year lifespan of the CMP;

5. 5 key recommendations for improved public consultation;

6. strong support for the content/style of the text and maps contained within the Consultation Report.

An issue relating to the Rythe Stream, just outside the boundary of this CMP, will be picked up in the River Thames Tideway CMP which is due to commence in September 1995. On the issue regarding the correct naming of Tributary 1 of the Hogsmill River, Tolworth Brook will be the name referred to in all subsequent NRA literature.

Meetings were held in March/April 1995 with relevant parties to agree a way forward on a number of issues and with internal staff to agree catchment specific works and investments proposed by NRA TR for inclusion in the Activity Plan (see Section 6).



*River Wandle
at Merton
Abbey Mills*

4. OVERVIEW OF CATCHMENT USES AND ACTIVITIES.

The Wandle, Beverley Brook and Hogsmill river catchments cover an area of 339 square kilometres between the River Thames and the dip slope of the North Downs to the south. Home to nearly a million people the catchment is predominantly urban in nature with housing development¹ *continuing to exert pressure on the water environment. The decline of heavy industry has paid environmental dividends in terms of reducing industrial effluent disposal² but treated sewage effluent disposal³ from such a highly concentrated population has inevitably had an impact on surface water quality. During low flow conditions treated sewage effluent can account for in excess of 90% of the river flow in the Wandle and Beverley Brook. The impermeable nature of urban development combined with floodplain encroachment has also resulted in a fundamental alteration to the natural hydrological regime with river levels rising very quickly during storm events. The economic benefits of protecting such heavily urbanised areas from flooding were used to justify large scale flood water conveyance⁴ schemes on the lower reaches of all three rivers particularly during the 1960's and 1970's.

The combination of poor water quality caused by urban storm water run off and treated sewage effluent, increased stream velocity and engineered concrete river channels has impacted heavily on the ecological status of many reaches of river particularly with regard to fisheries⁵ status. Enhancement opportunities do exist, especially where rivers run through existing public open space. These would also create added value to public enjoyment of the water environment, as well as improving ecological abundance and biodiversity.

Channelised Hogsmill River downstream of the sewage treatment works.



Local groundwater resources are utilised to supplement bulk transfers from the non tidal River Thames to meet water demand within the catchments; over 98% of the 240ML/day licensed maximum groundwater abstraction⁶ within the catchment is used for potable supply. Groundwater abstraction has affected base flows in the River Wandle and Hogsmill River, which are both spring fed. Relevant NRA abstraction licenses include a requirement to maintain flows when they are low, e.g. river water abstraction⁶ from the Wandle at Goat Bridge is used to top up flows in Carshalton Ponds under low flow conditions. The natural quality of groundwater from the chalk aquifer remains good, but localised groundwater within the superficial gravel aquifers to the north of the catchment remain polluted from historical industrial activity. Transport and disposal of domestic solid waste currently poses a limited threat to ground and surface water. However, the future disposal of solid waste⁷ to backfill pits excavated for gravel extraction⁸ purposes, in the Beddington/Mitcham Area of Opportunity, is under consideration following the Secretary of States recent decision to allow an appeal by TWUL.



Riverbank enhancement on the River Wandle at King George's Park, London Borough of Wandsworth.

Making the most of the recreation,¹⁰ amenity¹¹ and education¹² opportunities offered by the water environment within such a heavily populated catchment is a prime objective e.g. the micro-turbine on the River Wandle as a modern day example of the historical use of the river for water power.¹³ The conservation¹⁴ of existing ecologically important water dependent habitats, riverine landscapes,¹⁵ sites of archaeological importance¹⁶ and the rehabilitation / enhancement of degraded river reaches will increase the value that people living and working within the catchment place on the water environment.



Half-tide weir at the River Wandle/River Thames confluence.

* 16 catchment uses and activities identified.

5. SUSTAINABLE DEVELOPMENT

The concept of sustainable development, now recognised by governments across the world, acknowledges that people are putting pressure on both local and global resources to an extent which could cause permanent environmental damage.

The Government, in embracing sustainable development, is attempting to reconcile the need for future development with the need to protect the environment. This is where the nation's land-use planning system can have a significant influence and why NRA TR is putting such effort into working in partnership with Local Planning Authorities.

This is essential as the NRA, though well placed to influence some of the factors affecting the water environment, has very little control over the mechanisms which determine land use change on a catchment-wide basis. In the case of this CMP, this is largely the responsibility of the twelve local planning authorities through the implementation of the Town and Country Planning Acts.

The policies in statutory development plans are important in this regard in that they set out the framework for land use change and provide the key reference in determining development applications.

Since its creation in 1989 NRA Thames Region has been working with Local Authorities within this catchment to ensure that policies to protect and enhance the water environment reflect concerns over the potential impact of new developments on water quality, quantity and ecological status.

To facilitate effective incorporation of such policies in statutory development plans, NRA Thames Region is currently preparing land use statements based on catchment specific issues as identified in the CMP; an example of which is given in Appendix C. An important factor in helping the NRA to justify the need for inclusion of a specific policy in a statutory development plan will be the recorded strength of feeling from consultees on those water issues related to land use. In responding to the CMP Consultation Report, the local community is playing a role in influencing the future sustainable development of the water environment.

NRA TR is also attempting to ensure that the activities to be carried out in this Action Plan meet similar sustainability criteria to policies promoted in statutory development plans. Such an approach has been made possible by setting the activities shown in Section 6 against a number of sustainable criteria adapted from the DoE publication entitled "Guidelines for the Environmental Appraisal of Development Plans".

As the vision for this CMP embraces the principles of environmental sustainability, progression of any activity which fails these criteria may be inappropriate at the current time.

NRA TR is aware of the need to develop this approach as sustainability criteria, in reality, have different weightings and allowance needs to be made for social, political and economic benefits that accrue from the progression of any particular activity.

It is necessary to emphasise that environmental sustainability does not prejudice development. It involves reconciling the needs of economic development and effective environmental protection and enhancement. To this end, NRA TR welcomes any future opportunities to work in partnership with Local Authorities, businesses and community groups in bidding for UK/EC grants to secure funding for sustainable development of river corridors within this catchment. For example, a number of successful first round bids by Local Authorities under Single Regeneration Budget Programmes will result in future economic and environmental improvements in the River Wandle corridor.

If sustainability is to be developed as a practicable objective then clear measurement of progress will be required. NRA TR is aware of a growing need to identify key environmental indicators for the water environment to help Local Authorities and communities in moving towards sustainability through Local Agenda 21 Initiatives. Information collected in this CMP e.g. length of river meeting its quality objective, is being used as environmental indicators. NRA Thames Region is itself undertaking a strategic planning initiative, entitled 'Thames 21', for the water environment of the region as a whole. It provides a regional context for the preparation of CMPs by identifying strategic development issues which these plans need to address. Whilst no such issues have been identified for this CMP, Thames 21 also provides a further set of principles and criteria against which NRA functional activities can be assessed for sustainable development. These complement the DoE sustainability criteria previously mentioned.

The CMP Annual Review will also contain an Education Supplement for use by local schools across all key stages which will contain information on environmental indicators, local water issues and general river quality performance. It is hoped that by encouraging the direct involvement of the younger generation in the catchment management process, the ensuing sense of ownership and local pride in the water environment will help minimise future problems.



*Riverbank
enhancement
at Mill lane
Carsbalton; a
working
example of
sustainable
development.*



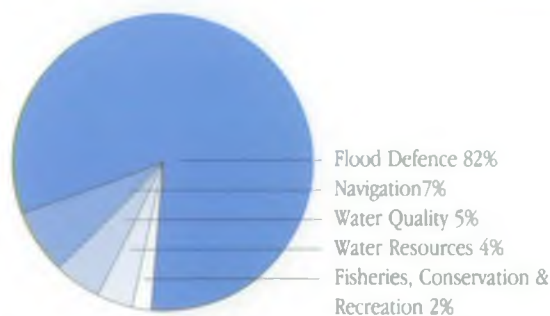
*Informal
recreation on
the Green
Lanes stream,
Hogsmill
River*

6. ACTIVITY PLAN

Implementation of the plan is based on the 33 key issues set out in the following tables. These have been modified in the light of consultation responses and their resolution is considered necessary in order that the plan can be successful in delivering real sustainable improvements within the river catchment. The issues are presented with a number of prioritised actions (High, Medium, Low) each with a target timetable and identification of parties responsible. Issues which are similar or interdependent have been grouped under the nine strategic objectives spawned by public consultation. New issues and actions raised following consultation are identified (in italics) together with activity options which will not be progressed within the 5 year life span of the CMP. Staff responsible for delivering NRA activities are identified by their initials in the Activity Plan for progress monitoring purposes and as an initial point of contact for interested external parties. Full names, telephone numbers and a Glossary of Abbreviations for partners in the Activity Plan are given in Appendix D.

The NRA activities will be incorporated into the appropriate annual Business Plan through the Corporate Planning process. This clearly defined process endeavours to match the agreed needs and priorities for action, as set out in the CMPs, with available resources and National NRA Strategies. These National Corporate and Functional Strategies are encapsulations of the NRA's intent for the organisation and each of its functions, whilst CMPs reflect the desired status of individual river catchments. Corporate Planning resolves the tensions between these requirements to produce annual Business Plans. These plans include NRA commitment of resources to specific actions and are used to cascade objectives and tasks to individual members of staff. The marginal NRA costs (£K) detailed in this CMP Activity Plan form part of budgeted total payments of over £20 million for the SE Area of NRA Thames Region in 1995/1996. This is largely used for routine operational, monitoring and enforcement duties throughout all the river catchments in the SE Area. It should be noted that the sum for flood defence includes the costs of associated river habitat conservation /enhancement schemes and operation and maintenance of the Thames Barrier.

TOTAL BUDGETED PAYMENTS (£20M) FOR SE AREA (1995/96)



OBJECTIVE 1 : TO PROTECT AND IMPROVE SURFACE AND GROUNDWATER QUALITY.

Activity	Resp	Cost	95	96	97	98	99	P
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ISSUE 1 : POOR CHEMICAL RIVER WATER QUALITY DOWNSTREAM OF THE THREE TWUL SEWAGE TREATMENT WORKS

- | | | | | | | | | |
|---|-------------|-------|---|---|---|---|---|---|
| 1/1 Undertake improvement works at Worcester Park STW to achieve short-term RQO of RE4 by year 2000.
(Output - Construction works by 1999). (PJL). | TWUL | 11350 | ■ | ■ | ■ | ■ | ■ | H |
| 1/2 Undertake improvement works at Hogsmill STW to achieve short-term RQO of RE4 by year 2000.
(Output - Construction works by 1999). (PJL). | TWUL | 12290 | ■ | ■ | ■ | ■ | ■ | H |
| 1/3 Undertake improvement works at Beddington STW to maintain downstream RQO at RE4; currently achieved through over-performance; and improve screening.
(Output - Construction works by 1999). (PJL). | TWUL | unk | ■ | ■ | ■ | ■ | ■ | H |
| 1/4 Establish feasibility of LTRQO of RE3 downstream of Beddington and Worcester Park STWs subject to appraisal of cost benefits. (Output - NRA report 4/97). (PJL) | NRA
TWUL | unk | | | ■ | ■ | ■ | H |

ISSUE 2 : LINDANE DISCHARGES FROM THE CATCHMENT CONTRIBUTE TO FAILURE OF EC DANGEROUS SUBSTANCES DIRECTIVE IN MAIN RIVER THAMES

- | | | | | | | | | |
|--|--------------------|-----|---|---|--|--|--|---|
| 2/1 NRA to fully discuss with DoE implications of directive non-compliance.
(Output - to be reported in annual CMP review). (JE). | NRA
DoE
TWUL | unk | ■ | ■ | | | | M |
|--|--------------------|-----|---|---|--|--|--|---|

ISSUE 3 : IMPACT OF URBAN STORMWATER RUNOFF ON RIVER WATER QUALITY

- | | | | | | | | | |
|---|------------|-----|---|---|---|---|---|---|
| 3/1 Utilise Local Authority Town and Country Planning, NRA Land Drainage consents and other appropriate controls to minimise impacts from new developments.
(Output - new developments which meet this aim).(JVL). | NRA
LAs | N/A | ■ | | | | | H |
| 3/2 Implement recommendations from Source Control pilot project on the Middle Lee as appropriate
(Output - NRA report 4/97). (MJT). | NRA
LAs | N/A | ■ | ■ | ■ | ■ | ■ | L |
| 3/3 Create 2 wetlands on Tooting Bec Common to mitigate impact of urban stormwater run-off.
(Output - Construction Works ongoing). (DW).
(see also activity 14/1). | LBW | unk | ■ | ■ | ■ | | | M |

OBJECTIVE 1 : TO PROTECT AND IMPROVE SURFACE AND GROUNDWATER QUALITY.

Activity	Resp	Cost	95	96	97	98	99	P
ISSUE 4 : NUISANCE MIDGE SWARMS BELOW WORCESTER PARK SEWAGE TREATMENT WORKS								
4/1 Introduce more stringent discharge consent.(PJL).								Investment under activity 1/1 as part of AMP2 negotiations should solve problem of midge swarms.
4/2 Continue to jet wash silts at appropriate times of year to disseminate midge swarms. (Output - jet washing as required).(PJL).	NRA	3						L
4/3 Instigate feasibility study into enhancement of river channel morphology to reduce silt entrapment. (Output - NRA Report 4/97).(PJL).	NRA	unk						M
4/4 Implement local sampling study to determine relationship between silt accretion and sewage treatment works effluent quality. (Output - NRA Report 7/95). (PJL).	NRA	1.5						H
ISSUE 5 : CONFLICT BETWEEN INCREASED PUBLIC ACCESS TO WATERFRONT AND PUBLIC HEALTH CONSIDERATIONS.								
5/1 NRA to liaise with London Walking Forum to produce and distribute appropriate information to all interested parties. (Output - Information Leaflet 12/95).(CJW).	NRA LWF	2						H
5/2 Identification and removal of illegal foul sewer connections to surface water outfalls. (Output - statistics in annual CMP review).(PJL).	NRA TWUL	N/A						M
5/3 NRA to continue working with DoE in defining appropriate bacteriological standards for the inland recreational waters. (Output - DoE guidance to be reported on availability in annual CMP review).(PJL).	NRA DoE	N/A						M
5/4 Investigate cost/benefit of improving bacteriological quality of consented treated sewage effluent discharges within the catchment.(PJL).								Action deemed inappropriate at the current time in the absence of appropriate guidance from the DoE.

OBJECTIVE 1 : TO PROTECT AND IMPROVE SURFACE AND GROUNDWATER QUALITY.

Activity	Resp	Cost	95	96	97	98	99	P
ISSUE 6 : PRESENCE OF BLUE GREEN ALGAE IN STILL WATERS								
6/1 Richmond Park ponds survey complete. (Output - NRA Report to Royal Parks Agency).(PJL).	NRA RPA	N/A						N/A
6/2 <i>Instigate Carsbalton Ponds survey on Upper Wandle.</i> (Output - NRA Report to LBS as appropriate).(PJL).	NRA	1						H
ISSUE 7 : FREQUENCY OF POLLUTION INCIDENTS IN CONTROLLED WATERS								
7/1 Public awareness raised by ongoing pollution prevention campaigns e.g. 'oil care' and 'emergency hotline', school talks and NRA attendance at local events. (Output - Distribution of PR resources).(PJL).	NRA	N/A						H
7/2 <i>NRA contribution to new exhibition on the River Wandle at the Old Liberty Mill Wheelhouse.</i> (Output - PR leaflets and static display boards).(RMH).	WHL NRA	1						M
7/3 NRA programme of pollution prevention at; Davis Road, Cox Lane, Chessington (Hogsmill); Longmead Industrial Estate, Epsom (Hogsmill); Garth Road Industrial Area, Morden (Beverley); Deer Park Road Industrial Area, Merton (Wandle); Willow Lane Industrial Estate, Mitcham (Wandle).(PJL).	NRA	2 2 2 3 4						H
7/4 <i>NRA Emergency Response Plans to be drawn up to improve response to pollution incidents.</i> (Output - Hogsmill River Emergency Plan; River Wandle Emergency Plan; Beverley Brook Emergency Plan.).(PJL).	NRA LAS	1 0.5 0.5						H
7/5 Evaluation of new technology and improved working methods for identifying, tracing and alleviating impacts of water pollutants. (Output - update in CMP review as appropriate).(PJL).	NRA	unk						M
7/6 <i>Implementation recommendations from NRA sponsored R&D Report into pollution from highway drainage.</i> (Output - CIRIA Report No. 142).(PJL/MF).	NRA							L
7/7 <i>Pollution investigation into nuisance odours from Tolworth Brook under low flow conditions.(PJL).</i>								Postponed pending direct pollution complaints to NRA Emergency Hotline.

OBJECTIVE I : TO PROTECT AND IMPROVE SURFACE AND GROUNDWATER QUALITY.

Activity	Resp	Cost	95	96	97	98	99	P
ISSUE 8 : VULNERABILITY OF LOCAL GROUNDWATER QUALITY TO POLLUTION								
8/1 Promote NRA 'Policy and Practice for the Protection of Groundwater' to raise public awareness. (Output - distribution of document and associated PR material as appropriate).(SMH).	NRA	1	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	H
8/2 Prepare and promote 1:100 000 vulnerability maps showing aquifers to be protected and detailed maps showing areas around key boreholes which require protection. (Output - maps 5/96).(SMH).	NRA	unk	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	H
8/3 Hold technical seminar for local authorities and all interested parties on local groundwater quality issues. (Output - Seminar 4/96).(MJH).	NRA IAs	3	<div></div>					H
8/4 Improve and review groundwater quality monitoring programme. (Output - ongoing).(SMH). See also activities 3/2, 3/3, 7/1, 7/6.	NRA	unk	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	H
8/5 Raise awareness of impact of Golf Course development proposals on water environment. (Output - Compile and promote specific NRA guidance note to all interested parties 4/96).(AB).	NRA	1	<div></div>	<div></div>				H

OBJECTIVE 2 : TO PROTECT LOW FLOWS FROM REDUCTION AND INVESTIGATE ALLEVIATION.

Activity	Resp	Cost	95	96	97	98	99	P
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ISSUE 9 : PERIODIC LOW FLOWS IN SPRING-FED PONDS ON THE UPPER WANDLE.

9/1 NRA to ensure that where necessary measures to protect spring fed ponds are in place, effective and operated in accordance with license conditions. (Output - NRA Report to LBS 09/95).(VKR).	NRA LBS SDW	1						II
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ISSUE 10 : IMPACT OF URBAN DEVELOPMENT ON GROUNDWATER RESOURCES

10/1 Set minimum acceptable groundwater levels for all water dependent SSSIs within the catchment.(AD).								Not to be progressed as Stones Road Pond SSSI does not fit MAFF priority criteria for water level management plans due to location on non-main river.
10/2 Identify development pressure points through NRA Thames 21 and NRA TR Water Resources Strategies and ensure statutory development plans promote suitable policies for sustainable groundwater resource usage. (Output - developments which meet aim).(HRH/BPA).	NRA LAs	unk						H
10/3 Promote efficient use of water. (Output - distribution of appropriate PR material).(BPA). See also activity 8/5	NRA LAs WUs	1						M

ISSUE 11 : LOW FLOWS IN BEVERLEY BROOK D/S OF THE FLOOD RELIEF CULVERTS

11/1 Set up multifunctional NRA project to expand consultants brief on a proposed strategic flood study of the Beverley Brook catchment to establish acceptable water levels. (Output - update in annual CMP review).(DJW).	NRA	50						H
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OBJECTIVE 3 : TO INTEGRATE THE MANAGEMENT OF ENVIRONMENTALLY SENSITIVE FLOOD DEFENCE WORKS WITH CONTROL OF SURFACE WATER RUN-OFF.

Activity	Resp	Cost	95	96	97	98	99	P
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ISSUE 12 : LACK OF HISTORIC AND MODELLED CATCHMENT FLOODING DATA

12/1 Complete Section 105 Surveys for all 3 rivers (CEC/DJW)

Programme to be determined by NRA Board 06/95

12/2 Complete strategic flood studies on Beverley Brook and Wandle (Output- NRA Report on potential flood alleviation schemes 12/99). (DJW). Links with Issue 13

NRA	500							H
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ISSUE 13 : REDRESS THE BALANCE BETWEEN THE NEED FOR FLOOD PROTECTION ON THE HOGSMILL RIVER AND ENVIRONMENTAL REQUIREMENTS

13/1 Completely rebuild existing river channel following cost/benefit analysis.(CEC).

All activity held in abeyance pending satisfactory funding and resolution of Issue 12.

13/2 Modify existing channel as one scheme following cost/benefit analysis.(CEC).

13/3 Modify channel as redevelopment opportunities arise.(CEC).
see also activity 23/3.

ISSUE 14 : NRA TR HAS NO EFFECTIVE LEGISLATIVE CONTROL IN SETTING SURFACE WATER RUN-OFF STORAGE/CRITERIA FROM NEW DEVELOPMENTS

14/1 Complete surface water zoning exercises for the River Wandle and Hogsmill River.
(Output - catchment zoning maps 4/96).(BNC).
links with activity 8/4.

NRA	20							H
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14/2 Promote zoning maps and appropriate policies to Local Authorities for inclusion in statutory development plans.(MJT).
(Output - developments which meet this aim).

NRA	N/A							H
Las								

14/3 NRA and all interested parties to seek appropriate changes in legislation.
(Output - update in annual CMP review).(JVL).
see also activity 3/1.

NRA	N/A							M
DoE								

ISSUE 15 : INSUFFICIENT DATA ON RIVER LEVELS WITHIN CERTAIN RIVER REACHES

15/1 Install appropriate river level gauges on upper reaches of Beverley Brook and Norbury Brook.
(Output - construction works 12/98).(CMH).

NRA	20							M
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OBJECTIVE 3 : TO INTEGRATE THE MANAGEMENT OF ENVIRONMENTALLY SENSITIVE FLOOD DEFENCE WORKS WITH CONTROL OF SURFACE WATER RUN-OFF.

Activity	Resp	Cost	95	96	97	98	99	P
ISSUE 16 : SEEK TO MINIMISE IMPACT OF ARTIFICIAL RIVER CHANNEL AND CORRIDOR.								
16/1 NRA to desilt culverts at:								
A3 crossing Beverley Brook u/s of Wimbledon Common; Pyl Brook near Anton Crescent Wetland. (Output - maintenance works 04/96).(DJW).	NRA	50 10	■	■				H
16/2 Implement desilting programme in Anton Crescent Wetland as part of agreed prescriptive management plan for the site. (Output - desilting works 04/96).(DJW).								
	NRA LBS	50	■	■				H
16/3 NRA to implement miscellaneous improvements to:								
River Wandle, Morden Hall, reed planting;	NRA	5	■	■				M
River Wandle, Beddington, reed planting (Output - improvement works 04/96).(DW).		10						M
16/4 Complete feasibility study into options for full/partial channel enhancement and wetland creation on a tributary of the River Wandle at Colliers Wood and implement agreed scheme. (Output - Consultants Report 12/95).(RMC).								
	NRA LBM NT	150	■					M
16/5 Complete feasibility study into options for enhancement of Norbury Brook channel and implement agreed scheme. (Output - Consultants Report 4/96).(DW).								
	NRA LBC	20	■	■				M
16/6 Seek partnership approach to funding long term maintenance of channel enhancement schemes. (Output - update in annual CMP review).(DW). see also activities 13/1-3,18/1,18/2								
	NRA LAs CG WT	N/A	■	■	■	■	■	M

ISSUE 17 : SAFETY RISK TO SMALL CRAFT ON THE RIVER THAMES FROM RIVER TIDGSMILL INFLOWS.

17/1 NRA to liaise with BCU and SC to discuss need / feasibility of additional actions over and above existing practice of exhibiting 'strong current' notices at lock sites on River Thames during spate conditions. (Output - outcome of liaison meetings to be reported in annual CMP review).(PJG).	NRA BCU SC	1	■	■				M
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OBJECTIVE 4 : TO PROTECT AND ENHANCE PERMANENT WATERBODIES.

Activity	Resp	Cost	95	96	97	98	99	P
ISSUE 18 : DEFICIENCY OF PERMANENT WATERBODIES WITHIN FLOOD STORAGE AREAS								
18/1 NRA to design-in permanent waterbodies within new flood storage areas where appropriate and to encourage partnership approach with external bodies in actively managing resource for conservation, recreation and education purposes. (Output - Creation of flood storage areas which meet this aim - progress to be reported in CMP reviews).(DJW).	NRA LAs CGNT	unk						H
18/2 Retrofit permanent waterbodies within appropriate existing flood storage areas. (Output - Permanent waterbody in Derwent Road flood storage area on Beverley Brook 12/96).(DJW).	NRA LBM	10						M
18/3 NRA in partnership with local authorities and conservation groups to compile a catchment list of historic, existing and potential sites for permanent waterbodies and promote various funding initiatives available. (Output - Update in annual CMP review).(DW). See also activities 3/3, 3/4, 8/4.	NRA LAs CGNT	2?						H
ISSUE 19 : NEED TO MAXIMISE ENVIRONMENTAL AND RECREATIONAL POTENTIAL ASSOCIATED WITH THE STRATEGIC PROVISION OF FLOOD STORAGE WITHIN THE BEDDINGTON/MITCHAM AREA OF OPPORTUNITY (BMAO).								
19/1 NRA to work in partnership with TWUL, LBS and other interested parties to realise the potential of the BMAO for a variety of water uses following outcome of the Public Enquiry on proposed gravel extraction and landfill proposals. (Output - works which meet these aims).(JVL).	NRA TWUL LBS CGWT	N/A						H
ISSUE 20 : NEED TO PROTECT AND ENHANCE STILL WATERS								
20/1 NRA, Local Authorities and all interested parties to resolve conflict between uses of Wimbledon Park Lake and other water bodies. (Output - outcome of liaison meetings to be reported in annual CMP reviews).(TK/CW).	NRA LAs WS	N/A						H
20/2 NRA to raise public awareness of its duties and responsibilities regarding still waters; particularly within urban catchments.(GWP). see also activity 18/3.	NRA	2						H

OBJECTIVE 5 : TO IMPROVE MANAGEMENT TECHNIQUES FOR INSTREAM AND BANKSIDE HABITATS AND LANDSCAPES

Activity	Resp	Cost	95	96	97	98	99	P
ISSUE 21 : NEED FOR APPROPRIATE MANAGEMENT TECHNIQUES FOR RIVER REACHES								
21/1 Initiate river reach specification methodology based on pilot study on Blackwater River for Wandle, Beverley, Hogsmill Catchment. (Output - maps and guidance notes 04/97).(CEC/DJW).	NRA	unk	■	■	■			M
21/2 Promote NRA Wildlife and Conservation Handbook. (Output - circulate promotional material to consultees 12/95).(RMH).	NRA	1	■					H
21/3 Raise awareness of riparian owners to their rights and responsibilities regarding riverbank maintenance. (Output - Distribution of NRA 'Riverside Owners Guide' to consultees 12/95).(RMH).	NRA	1	■					H
21/4 NRA to liaise with relevant LAs and interested parties to clarify issues regarding seasonal streams in Caterham/Coulsdon area. (Output - update in annual CMP reviews).(RMH).	NRA LAs	N/A	■	■				L
ISSUE 22 : ECOLOGICAL STATUS OF RIVER WANDLE BELOW BEDDINGTON STW CANNOT BE ASSESSED BY ANY ONE METHOD IN ISOLATION								
22/1 Undertake multi-functional monitoring survey to assess long-term water quality and assist identification of any trends which may influence ecological status. (Output - NRA Report 12/97).(PIL).	NRA	unk	■	■	■			M
22/2 NRA to continue working with DoF in drawing up a GQA biological window to identify ecological quality. (Output - update in annual CMP review).(DL).	NRA	unk	■	■				M
22/3 Complete assessment of plant growth in rivers downstream of Beddington and Hogsmill STWs. (Output - NRA Report 12/97).(DL).	NRA	unk	■	■	■			M
ISSUE 23 : NEED TO PROTECT EXISTING IN-STREAM AND BANKSIDE HABITATS AND LANDSCAPE								
23/1 Update River Corridor Surveys for River Wandle, Beverley Brook and Hogsmill River. (Output - NRA Report 12/99) (DW).	NRA	20				■	■	
23/2 Promote NRA guidance leaflet on 'Management of Invasive Plant Species' to all interested parties. (Output - Distribution to consultees 12/95).(RMH).	NRA	1	■					

OBJECTIVE 5 : TO IMPROVE MANAGEMENT TECHNIQUES FOR INSTREAM AND BANKSIDE HABITATS AND LANDSCAPES.

Activity	Resp	Cost	95	96	97	98	99	P
ISSUE 23 (cont): NEED TO PROTECT EXISTING IN-STREAM AND BANKSIDE HABITATS AND LANDSCAPES								
23/3 Eradication of invasive Japanese Knotweed from Hogsmill River corridor to protect existing flood defence assets and promote diversity of riverbank flora. (Output - eradication of Knotweed by 1999).(CEC).	NRA EEBC RBK	40	■	■	■	■	■	M
23/4 Implement joint Beverley Brook / River Wandle Landscape Assessment incorporating existing assessment of Hogsmill River and seek part funding from interested parties e.g. Local Authorities and Royal Parks Agency. (Output - NRA Report 03/97).(RMC).	NRA LAS RPA	10	■	■				H
23/5 Implement recommendations of NRA R&D project on 'Conservation Targets for CMPs'. (Output - NRA Report F02 03/97).(MF).	NRA	unk 40	■	■				M
ISSUE 24 : NEED TO PROTECT BIOLOGICAL STATUS OF RIVER HEADWATERS.								
24/1 Species level macroinvertebrate surveys of the headwaters of the River Wandle and Beverley Brook to compliment existing data on the Hogsmill River and produce protection / enhancement recommendations. (Output - NRA Report 12/97).(DL). see also activities 3/2, 7/1, 7/3, 33/4.	NRA	5	■	■	■			H
ISSUE 25 (NEW) : NEED TO PROTECT THE ARCHAEOLOGICAL VALUE OF RIVERS AND RIVERBANKS.								
25/1 Promote EA Scoping Guidance and EA Guidance to Developers which incorporates recommendations from NRA R&D Note 289 'NRA and Archaeology'(Output - circulate Guidance to all appropriate consultees 12/95).(RMH).	NRA	1	■					
25/2 Incorporate existing NRA GIS data on sites of archaeological importance/interest on CMP constraints / opportunities map - see also 23/1 (Output - to accompany CMP annual review).(KTF).	NRA	1	■					H
25/3 Raise public awareness through publication of Wandle Trail Guide. (Output - publication by 03/96).(RMH).	NRA	3	■					H

OBJECTIVE 6 : TO MAXIMISE THE ENVIRONMENTAL BENEFIT OF WATER CONTROL STRUCTURES.

Activity	Resp	Cost	95	96	97	98	99	P
ISSUE 26 : MINIMISE THE IMPACT OF SUBSTANTIAL WATER CONTROL STRUCTURES								
26/1 Ensure coarse fish passes are built into existing structures when renovated. (Output - Construction works as appropriate).(SRC).	NRA	unk						M
26/2 Ensure that new structures are subject to full environmental impact assessment. (Output - structures built that meet this aim).(CEC/DJW).	NRA	unk						M
26/3 <i>NRA to work with interested parties to assess feasibility of altering operational regime of water control structures to be more sympathetic with industrial heritage; particularly on the River Wandle.</i> (Output - outcome of liaison meetings to be reported in annual CMP reviews).(DJW).	NRA WIM WHL	N/A						M
ISSUE 27 : MINIMISE ENVIRONMENTAL IMPACT OF THE HALF-TIDE WEIR ON THE RIVER WANDLE.								
27/1 <i>Implementation of an appropriate de-silting programme for the Wandle tidal creek following NRA fishery survey - see activity 31/1</i> (Output - de-silting programme 03/96).(JVL).	LBW NRA	20						H
27/2 <i>NRA to work in partnership with LBW on site specific improvements to lower Wandle pending outcome of second phase Single Regeneration Bid</i> (Output - details of enhancements in annual CMP review).(DW).	LBW NRA	50						H
27/3 <i>NRA and LBW to work with all interested parties to secure funding for a feasibility study into substantial ecological enhancement of the Wandle tidal creek area.</i> (Output - update in CMP annual review).(JVL).	LBW NRA	unk						H
27/4 <i>Promotion of policies for consideration in development site planning briefs to aid sustainable development of Wandle tidal creek area.</i> (Output - planning briefs which meet this aim).(JVL).	NRA LBW	N/A						H
27/5 <i>Review the need for a full environmental/economic reappraisal of the half-tide weir.</i> (Output - update CMP annual review).(JVL).	LBW	unk						L

OBJECTIVE 6 : TO MAXIMISE THE ENVIRONMENTAL BENEFIT OF WATER CONTROL STRUCTURES.

Activity	Resp	Cost	95	96	97	98	99	P
ISSUE 28 : REASSESS ENVIRONMENTAL IMPACT OF THE MICRO-TURBINE ON THE RIVER WANDLE.								
28/1 Undertake 'scoping study' to assess need for post-project appraisal in the light of 'NRA Hydropower Working Party Handbook'. (Output - update in CMP review).(DJW).	NRA	1						H
28/2 NRA requested to support removal of the micro-turbine.(DJW).								Currently no evidence of ecological damage to support this request. Position to be reviewed on completion of 28/1

OBJECTIVE 7 : TO BALANCE THE NEEDS BETWEEN THE RECREATION AND CONSERVATION USES OF CONTROLLED WATERS.

ISSUE 29 : LACK OF A CLEAR DEFINITION OF EFFECTIVE BUFFER ZONE WIDTH

29/1 NRA to work with all interested parties in identifying suitable buffer zones for river reaches. (Output - inclusion in river reach maps; see 21/1).(JVL).	NRA	N/A						M
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ISSUE 30 : CONFLICT BETWEEN RECREATION AND CONSERVATION USES OF CONTROLLED WATERS.

30/1 Preparation of agreed recommendations for resolving existing/potential conflicts based on study of information collected during CMP consultation process. (Output - update in CMP annual review).(CJW). see also activity 18/3, 20/1.	NRA	1						H
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OBJECTIVE 8 : TO MAINTAIN AND IMPROVE FISHERIES STATUS.

Activity	Resp	Cost	95	96	97	98	99	P
ISSUE 31 (NEW) : NEED TO MAXIMISE FISHERY POTENTIAL								
31/1 NRA to continue five year rolling programme of fishery surveys :	NRA							H
River Wandle tidal creek - see activity 27/1;	2							
Beverley Brook;	5							
Hogsmill River;	5							
River Wandle;	7							
(Output - NRA Reports and implementation of report recommendations). (SRC).								
31/2 Implement appropriate recommendations from NRA R&D Project on 'Factors Affecting Coarse Fish Populations in Lowland Rivers'.	NRA	unk						L
(Output - NRA R&D Report D02942 04/98). (SRC).		270						
31/3 Maintain viable populations of coarse fish by annual restocking of headwaters.	NRA	2						H
(Output - annual stocking programme). (SRC).								
31/4 Instigate 'mark and recapture' technique as an integral part of activity 31/1 to increase understanding of local fish population dynamics - links with activity 22/1.	NRA	1						H
(Output - Results in NRA Reports as 31/1). (SRC).								
31/5 Review implications of extending EC designated cyprinid fishery in upper reaches of the River Wandle to include reaches downstream of Beddington STW to the River Thames confluence.	DoE NRA TWUL	N/A						H
(Output - progress to be reported in annual CMP reviews). (PJL).								
see also activities 1/3, 19/1, 26/1, 26/2.								

OBJECTIVE 9 : TO PROMOTE COMMUNITY PRIDE IN LOCAL WATER ENVIRONMENT.

Activity	Resp	Cost	95	96	97	98	99	P
ISSUE 32 : IMPACT OF RUBBISH AND LITTER.								
32/1 NRA to continue working on 'Thames Clean' campaign with Tidy Britain Group and all interested parties of anti-litter and tidy river bank campaigns. (Output - clean-ups events to be reported in annual CMP review).(PJJ).	TBG NRA PLA LAS TWUL	50						H
ISSUE 33 : NEED TO PROMOTE LOCAL WATER ISSUES VIA FORMAL EDUCATION CHANNELS.								
33/1 Promote NRA 'Riverwork' primary school teaching pack, NRA 'Sources' secondary school teaching pack and National RiverWATCH schemes. (Output - every school in catchment to receive free copy of relevant pack by 12/95).(RMH).	NRA	2						H
33/2 Revise and update NRA River Fact File on the Wandle, Beverley Brook and Hogsmill catchment. (Output - publish revised fact file 03/96).(DC).	NRA	2						H
33/3 NRA to work in partnership with local education inspectors and teachers in production of an Education Supplement as an integral part of the annual CMP review. (Output - Education Supplement in annual CMP review 06/96).(TK/KVF).	NRA LAS	N/A						H
33/4 Develop 'key indicators' on well-being of local water environment with all interested parties and adapt for use within primary/secondary schools and LA21 fora within catchment. (Output - key indicators in Education Supplement section of annual CMP review 06/96).(MJT/TK).	LEU LAS NRA	1						H

7. FUTURE REVIEW AND MONITORING

The NRA TR will be jointly responsible, with other identified organisations and individuals, for implementing this Action Plan. Progress will be monitored and reported annually. These annual reviews will examine the need to update the CMP in the light of changes in the catchment, the NRA's priorities and available resources, and will take the form of a short progress report including work achieved compared with that planned. An Educational Supplement for use by local schools will also be included. The period between major revisions will normally be 5 years.

Further details of issues and activities in this Catchment Management Plan can be obtained from:

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Tim Knight, Catchment Planning Officer (SE)
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Riverside Works,
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Tel: 01932 789833



Anton Crescent wetland/flood storage area on the Pyl brook. A valuable conservation and education resource

APPENDIX A: THE RIVER ECOSYSTEM USE CLASSIFICATION

The River Ecosystem scheme provides a nationally consistent basis for setting RQOs. The scheme comprises five classes which reflect the chemical quality requirements of communities of plants and animals occurring in our rivers. The standards defining these classes reflect differing degrees of pollution by organic matter and other common pollutants. The River Ecosystem classes 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 following table shows short-term objectives in terms of RE use for river reaches within the Wandle, Beverley Brook and Hogsmill river catchment and should be considered as achievable stepping stones along the way to longer term goals.

The formal consultation process highlighted strong support for a further improvement of water quality to a level suitable for high class coarse fish populations downstream of Beddington STW. An RQO of RE4 for the Beverley Brook through Wimbledon Common and Richmond Park was also widely considered as inappropriate for such a high profile area of public open space. The establishment of long-term river quality objectives (LTRQOs) of RE3 downstream of both Beddington and Worcester Park STWs will be considered as part of the AMP3 negotiations between TWUL/OFWAT and NRA which will cover investment after the year 2000.

The River Ecosystem scheme takes forward the core standards from the old NWC scheme, but also incorporates new standards and firm rules on how the scheme should be applied. These are described in detail in the document "Water Quality Objectives: Procedures used by the National Rivers Authority for the purpose of the Surface Waters (River Ecosystem) (Classification) Regulations 1994" available from the water quality planning departments at Regional Offices (see NRA contact address).

RIVER ECOSYSTEM OBJECTIVES FOR RIVER REACHES WITHIN THE CATCHMENT

River	Reach	RQO(Year)	Re Achievement 1991-1993
Hogsmill	Bourne Hall to Hogsmill STW	RE3(1994)	Pass
Hogsmill	Hogsmill STW to River Thames	RE4(2000)	Fail*
Beverley Brook	Worcester Park STW to Pyl Brook	RE4(2000)	Fail*
Beverley Brook	Pyl Brook to the Thames Tideway	RE4(2000)	Fail*
Pylbrook	Sutton STW to Beverley Brook	RE3(1994)	Pass
Wandle (Carshalton Arm)	Source to the Wandle	RE2(1994)	Pass
Wandle (Beddington Arm)	Wandle Park to confluence	RE3(1994)	Pass
Wandle	Confluence to Beddington STW	RE2(1994)	Pass
Wandle	Beddington STW to Thames Tideway	RE4(2000)	Pass

* investment works scheduled in activity plan to ensure compliance with short-term RQO.

APPENDIX B: GENERAL QUALITY ASSESSMENT CLASSIFICATION

As well as taking decisions on measures to maintain or improve water 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. For example, using this scheme it is possible to say that overall, 16% (net) of the length of rivers in England and Wales improved in quality between 1990 and 1993.

In order to provide a comprehensive picture of the quality of our rivers, different aspects of the water environment will be looked at. We refer to these aspects as 'windows', because each offers a different perspective on the overall health of the river. A GQA scheme comprising four windows is being developed: a Chemistry Window; a Biology Window; a Nutrient Window and an Aesthetic Window.

- 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 grades are as follows:

A&B	Good
C&D	Fair
E	Poor
F	Bad

Chemistry data collected for 1990-1992 has been reported using the GQA scheme and is documented in *"The Quality of Rivers and Canals in England and Wales (1990-1992)"*.

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 e.g. nitrogen and phosphorous. 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 (e.g. sewage-derived). In other cases, visually unpleasant sights such as foaming or scums may result from natural causes.

APPENDIX C: EXAMPLE LAND USE STATEMENT

The following example relates to a land use issue identified in the Activity Plan; Issue 3: Impact of urban stormwater runoff on river water quality.

UNDERSTANDING THE GENERAL ISSUE OF SURFACE WATER RUN-OFF

New development replaces ground area that is capable of absorbing rainfall, with impermeable hard surfaces such as roofs and paving, thus increasing both the volume and speed with which surface water reaches streams and rivers. This can result in an increased risk of flooding. Other consequential effects may include reduction in both river base flows and aquifer recharge, increased pollution, silt deposition, damage to river habitats and channel instability. This is a problem which can be caused by development anywhere within a river catchment and is not restricted to development in the floodplain.

THE LOCAL CONTEXT

NRA Thames Region has produced surface water zoning maps to address this issue from a flood defence viewpoint (see Section 2.10 Consultation Report). Information is currently only available for the Beverley Brook catchment but will be completed for the River Wandle and Hogsmill River by the start of 1996 (see activity 14/1). NRA Thames Region advise that no new development within a red zone should be allowed to drain to the Beverley Brook upstream from Wimbledon Common. NRA Thames Region would therefore promote to the appropriate Local Authorities (in this case RB Kingston-upon-Thames, LB Merton, LB Sutton and Epsom & Ewell Borough Council) the land use statement given below for inclusion in their statutory development plans. Guidance for Planning Authorities on dealing with surface water run-off from development is contained in DoE Circular 30/92 "Development and Flood Risk"

SURFACE WATER RUN-OFF GUIDANCE STATEMENT

The 'LOCAL AUTHORITY NAME' will resist development which would result in adverse impact on the 'RIVER NAME' due to additional surface water run-off. Development which could increase the risk of flooding must include appropriate attenuation or mitigation measures, including restoration of the floodplain, defined by the 'LOCAL AUTHORITY NAME' in consultation with the NRA and funded by the developer.

NOTE:

NRA Thames Region are currently working on a multi-functional surface water zoning scheme as the current scheme takes no account of minimum acceptable river flows which may be required in "red" zones to sustain ecological abundance and bio-diversity (see activity 3/2).

APPENDIX D

NRA CONTACT TELEPHONE NUMBERS

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ABBREVIATIONS FOR PARTNERS IN ACTIVITY PLAN

BCU	British Canoe Union
BK	Royal Borough of Kingston-upon Thames
BS	Bourne Society
CGWT	All interested Conservation Groups and Wildlife Trusts
DoE	Department of Environment
EN	English Nature
EEBC	Epsom and Ewell Borough Council
LAs	Local Authorities
LBC	London Borough of Croydon
LBM	London Borough of Merton
LBR	London Borough of Richmond-upon-Thames
LBS	London Borough of Sutton
LBW	London Borough of Wandsworth
LEU	London Ecology Unit
LWF	London Walking Forum
MAFF	Ministry of Agriculture, Fisheries and Food
MHS	Merton Historical Society
NT	National Trust
PLA	Port of London Authority
RPA	Royal Parks Agency
SC	Sports Council
SCC	Surrey County Council
SDW	Sutton District Water
TBG	Tidy Britain Group
TDC	Tandridge District Council
TWUL	Thames Water Utilities Limited
WDN	Wandle Delta Network
WG	Wandle Group
WHL	Wandle Heritage Limited
WIM	Wandle Industrial Museum
WUs	Water Utilities

APPENDIX E: GLOSSARY OF TERMS

Abstraction	Removal of water from surface water or groundwater, usually by pumping.
Asset Management Plan	5 year investment programmes for the water undertakers e.g. TWUL; drawn up through consultation with the NRA and others which require OFWAT approval.
Baseflow	The flow in a river derived from emergent groundwater and spring discharges.
Bio-diversity	A rich variety of living plants and animals.
Blue-green algae	Organisms with some properties characteristic of both bacteria and algae - natural inhabitants of many inland waters.
Buffer zone	A strip of land adjacent to a river which is free from any development.
Catchment	The total area of land which drains to a specified watercourse or waterbody.
Coarse fish	A freshwater fish which is not of the salmon family.
Ecosystem	A system involving the interactions between a community and its non-living environment.
Environmental indicator	A measure which can be used to assess the present state of the environment by looking at trends over time.
Floodplain encroachment	Development on low-lying land adjacent to a river where water is naturally stored during flood conditions.
Groundwater	Water which is contained within the pores and crevices of soils and rocks.
Riparian	Of or on the bank of a river; or relating to the legal rights of the landowner of a river bank.
Sustainable development	Management of the environment to meet the needs of the present without compromising the ability of future generations to do the same.

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The NRA is committed to the principles of stewardship and sustainability. In addition to pursuing its statutory responsibilities as Guardians of the Water Environment, the NRA will aim to establish and demonstrate wise environmental practice throughout all its functions.

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