

YOUR VIEWS

local environment agency plan

DARENT LEAP CONSULTATION DRAFT SEPTEMBER 1999



ENVIRONMENT AGENCY

Information Services Unit

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20/09/99



ENVIRONMENT
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The Darent LEAP Consultation Draft describes the issues within our remit that we consider are important for the Darent Catchment. It also includes a range of options for tackling these issues and potential partners. Your responses to this draft will be considered and where appropriate and practicable will be incorporated in the Final Plan which identifies our 5 year environmental enhancement action programme.

We welcome your views which you can submit by:

- 1) completing and returning this questionnaire
- 2) sending a written statement (separately or with the questionnaire).

Unfortunately we are unable to respond individually to your comments but the overall results of the process will be summarised in a Statement on Public Consultation, which will be automatically sent to everyone who makes a response.

COMMENTS ARE REQUIRED BY 24 DECEMBER 1999

All responses should be sent to the LEAPs Officer (Kent) at this address:

The Environment Agency
Orchard House
Endeavour Park
London Road
Addington
West Malling
Kent
ME19 5SH

Privacy Note

Response to this consultation is purely voluntary. The content of all responses will be used by the Agency to assist it in carrying out its statutory duties and the general details will be made public (this includes informing the applicant). Unless you specifically request otherwise or indicate that your response is confidential, we will make public (and provide to the applicant) your name and address and a general summary of your comments in response to this consultation. If you have no objection to or would prefer the full content of your response being made public and copied freely please indicate this in your response.

Your right of access to the information held and right to apply for rectification of the information are as prescribed in current data protection legislation.

Published September 1999

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I wish my comments to remain confidential

I have no objection to my comments being made public

ENVIRONMENT AGENCY



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Our ref AHB/L/G

From Ann Binks

Your ref

Ext. Number 4460

Date 2 November 1999

DARWENT DRAFT LEAP AND ENVIRONMENTAL OVERVIEW

This LEAP forms part of the Kent LEAP also. You may have seen this already. The Kent LEAP having 5 catchment LEAPS incorporated. You will note from page 5 that only strategic issues formed the Kent LEAP, with more local issues being identified within the Darwent.

Regards and Happy reading! **Please return to Brigid Newlands** at the Regional Library on completion of the circulation, enabling it to be part of the Regions library.

A handwritten signature in cursive script, appearing to read 'Ann Binks'.

ANN BINKS
Assistant Technical Planner

JM VE KG

RC AD

Distribution List John Macrae and LEAPs Team, Ipswich, Rona Chellew & LEAPs Team, Brampton, ~~Richard Kisby & LEAPs Team, Lincoln~~, Paul Dykes, Public Relations, last - Brigid Newlands Regional Library.

FOREWORD

The Environment Agency has a unique opportunity to enhance our environment and quality of life in an integrated way whilst furthering the objective of sustainable development. In this work it is able to build on its strong position as one of the most powerful environmental regulators in the world combining the regulation of air, land and water.

Local Environment Agency Plans (LEAPs) aim to identify the means for this improvement to the environment in a co-ordinated way, setting priorities and solving problems for the next five years. The Darent LEAP Consultation Draft provides an opportunity for everyone to take an interest in the environment and be actively involved in making a difference to its future.

This LEAP identifies local issues to support the broader, more strategic ones covered by the Kent Area LEAP. This takes into account the contrast between developed suburbs and a relatively unspoilt rural area. As well as providing a focus for achieving environmental enhancement by all participants in a sustainable manner it includes the identification of partnership opportunities.

This plan represents a shared vision for the future of our environment recognising the ever competing pressures present and will play a vital role in balancing the costs and benefits for its protection.

I would like to thank you for your time spent studying this plan and welcome any comments you wish to make about it. Your responses to this consultation exercise will be considered and where appropriate, incorporated into the final LEAP identifying how the Agency will enhance the environment of the Darent Catchment during the next five years.



Dr Binny Buckley
Kent Area Manager

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1. THE ENVIRONMENT AGENCY

The Agency's vision is:-

- *A better environment in England and Wales for present and future generations.*

The Agency's aims are:-

- to achieve major and continuous improvements in the quality of air, land and water
- to encourage the conservation of natural resources, animals and plants
- to make the most of pollution control and river-basin management
- to provide effective defence and warning systems to protect people and property against flooding from rivers and the sea
- to reduce the amount of waste by encouraging people to re-use and recycle their waste
- to improve standards of waste disposal
- to manage water resources to achieve the proper balance between the country's needs and the environment
- to work with other organisations to reclaim contaminated land
- to improve and develop salmon and freshwater fisheries
- to conserve and improve river navigation
- to tell people about environmental issues by educating and informing
- to set priorities and work out solutions that society can afford

The Agency will do this by:-

- being open and consulting others about our work
- basing our decisions around sound science and research
- valuing and developing our employees; and
- being efficient and businesslike in all we do

The Environment Agency has a wide range of duties and powers relating to different aspects of environmental management. (These duties together with those areas where the Agency has an interest, but no powers in, are described in more detail in the Environmental Overview). The Agency is required and guided by Government to use these duties and powers in order to help achieve the objective of sustainable development. The Brundtland Commission defined sustainable development "*as development that meets the needs of the present without compromising the ability of future generations to meet their own needs*".

At the heart of sustainable development is the integration of human needs and the environment within which we live. Indeed the creation of the Agency itself was in part a recognition of the need to take a more integrated and longer-term view of environmental management at a national level. We therefore have to reflect this in the way we work and in the decisions we make.

Taking a long-term perspective will require the Agency to anticipate risks and encourage precaution, particularly where impacts on the environment may have long-term effects, or when the effects are not reversible. The Agency must also develop its role to educate and inform society as a whole, as well as carrying out its prevention and enforcement activities, in order to ensure continuing protection and enhancement of the environment.

One of the key outcomes of the United Nations "Earth Summit" held in Rio de Janeiro in 1992 was agreement by governments that, in order to solve global environmental problems, local action is crucial: we must all therefore think globally but act locally.

Against this background the Agency has drawn up an Environmental Strategy to deal with the major problems by an integrated approach to the management of the whole environment. This approach has led to the identification of nine environmental concerns that will be used for the Agency's planning processes:-

- Addressing climate change
- Improving air quality
- Managing our water resources
- Enhancing biodiversity
- Managing our freshwater fisheries
- Delivering integrated river-basin management
- Conserving the land
- Managing waste
- Regulating major industries

1.1 Local Environment Agency Plans

The Environment Agency is committed to a programme of Local Environment Agency Plans (LEAPs) in order to produce a local agenda of integrated action for environmental improvement within the catchment. These will also allow the Agency to deploy its resources to best effect and optimise benefit for the local environment.

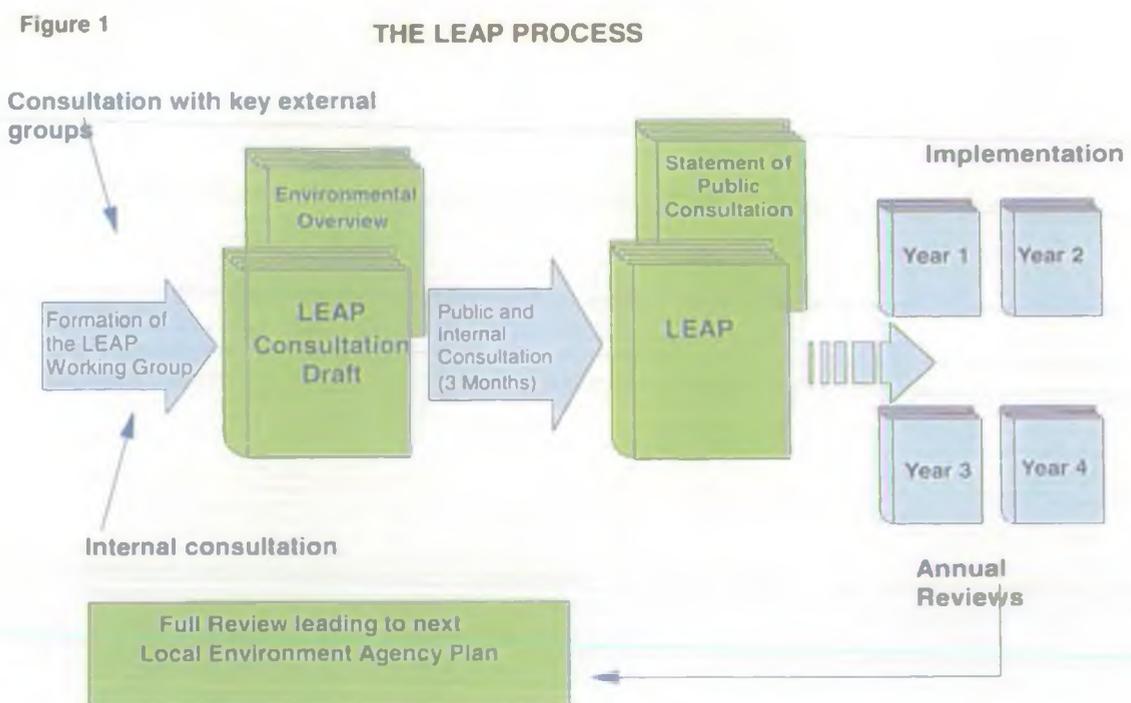
LEAPs help the Agency to identify and assess, prioritise and solve local environmental issues grouped around the nine environmental concerns, taking into account the views of local stakeholders. The outcome of the process is a local programme of integrated action for environmental improvement in order to optimise benefit for the local environment.

LEAPs replace the Catchment Management Plans that were produced by the former National Rivers Authority and build on their success by covering all the Agency's functions.

1.2 The LEAP Process

Each LEAP will take a long term view of local environments and set out a five year plan of action for solving local issues. Published Draft Consultation Reports will cover all parts of England and Wales, including the Southern Region of the Environment Agency, by the end of 1999, but this is only the first milestone in what will be an ongoing national programme of LEAPs, which will be regularly updated, developed and improved.

LEAP Diagram



1.3 LEAP Consultation Draft

The Darent LEAP Consultation Draft concentrates on the prioritisation of environmental issues relevant to the Agency and the identification of possible options for action necessary to restore/improve the local environment. This document is the main focus for public consultation. The issues and options for action put forward to address those issues have been structured around the Agency's nine environmental concerns, which aim to protect and enhance the environment in an integrated way and contribute towards the goal of sustainable development.

The publication of the Consultation Draft is the first output in the LEAP process and marks the start of a three month period of formal consultation. The consultation programme is intended to enable external organisation and the general public to work with the Agency in planning the future of the local environment. It gives you an opportunity to:

- highlight any issue/actions not already identified for the Darent catchment
- work towards establishing and implementing a five year action plan.

Please send your response in writing to the LEAP Officer at the address given on the cover of this report by *24 December 1999*.

At the end of the consultation period a Statement on Public Consultation will be produced which will provide feedback on the results of the consultation programme.

1.4 Environmental Overview

An Environmental Overview has been produced as a factual description and analysis of the local environment, looking at the impact of stresses on its state, and generating a list of issues for consideration by the Agency and others. The Environmental Overview supports the Consultation Draft and provides the background to the issues.

1.5 LEAP Plan

The final LEAP Plan will take into account the results of consultation and will be produced by March 2000. It contains a list of actions that take account of costs and benefits, identifying timescales and partner organisations. Agreed actions will be incorporated into the Agency's annual business plans.

1.6 Annual Review

The Agency will monitor implementation of the LEAP and report on progress in an Annual Review. The Annual Review will also identify any additional actions needed to maintain progress in light of any changes in the LEAP area and also whether any actions need removing or amending where they are no longer appropriate. After five years, or sooner if required, the Agency will carry out a major review of the progress that has been made. At this stage the Agency will produce a new LEAP Consultation Draft to reflect these changes to further improve the local environment.

1.7 Relationship with the Kent LEAP

In the Kent Area of the Agency an Area-wide LEAP has been prepared addressing strategic and significant issues. Local issues of particular relevance to the Darent catchment are addressed in this document (other catchment LEAPs for the Eastern Rother, Kentish Stour, Medway and North Kent are being produced separately). If you would like a copy of any of these LEAPs, as they become available, please send a request to the Agency at the address on the cover.

2. THE DARENT CATCHMENT

*... the silver Darent, in whose waters cleane
Ten thousand fishes play, and decke his pleasant streame...*

(The Faerie Queen, Edmund Spenser 1590)

The Darent has been shaped by human activity since early time and its beauty frequently celebrated by poets and artists. This environment seen today in the Darent Catchment is largely dependent on the underlying geology and the way it has been shaped by human and natural forces.

To the south lies the oldest formation in the area, the Lower Greensand. Above that lies thin bands of Gault Clay and Upper Greensand. These are overlain by the main bed in the catchment, the thick block of the Chalk forming the North Downs. Above this are smaller sections of London Tertiaries, largely corresponding with the main urban area.

The source of the Darent is to the west of Westerham and from here it flows to Otford, where it is joined by a major tributary, the Honeypot Stream, which is fed by springs from the Lower Greensand and Chalk. It then flows north fed by more chalk springs, particularly to the north of Shoreham, to its tidal limit at Dartford and is joined by the River Cray in its tidal length of Dartford Creek. The River Cray rises at Orpington and runs mainly on the Chalk through the edge of the urban area where it receives extensive run-off from paved areas during heavy rain. It is joined near Bexley by the River Shuttle, which is made up of almost entirely of urban run-off.

The rivers themselves bring valuable green corridors into the urban areas and the opportunities for their enjoyment have been enhanced by the development of footpaths running their lengths. They are also a focus for a range of other recreational activities such as fishing and sailing in adjacent flooded gravel pits including those at Chipstead, Sutton-at-Hone and Ruxley and public open spaces with visitor facilities such as Lullingstone and Hall Place, Bexley.

With rainfall averaging 700mm per year, the catchment is drier than the rest of the Kent Area and considerably drier than most of Britain. During the droughts in the early 1990s the Darent suffered very badly from low flows and completely dried up in places. A low flow alleviation scheme (ALF) has now been implemented to prevent the river drying out during summer months as a result of the combination of prolonged dry weather and increased abstractions for agricultural and development purposes.

The Darent Catchment lies in the north west corner of the Agency's Kent Area covering the area drained by the Rivers Darent, Cray and their tributaries. It is the smallest catchment in the Kent Area, with a land area of 400 km² but the inclusion of the outer suburbs of south east London and the adjoining area of

Kent gives it the highest population density in the Area (approximately 1000/km²). Administratively the Darent catchment falls mainly within Kent, the London Boroughs of Bexley and Bromley with small parts in Surrey and the London Borough of Greenwich.

Despite the small area and the heavily developed suburbs the catchment also includes a range of greatly contrasting landscapes. This changes from the marshland adjoining the Thames Estuary, which still retains some heavy industry, to the largely rural North Downs, with its scenic value recognised nationally by its designation as an Area of Outstanding Natural Beauty (AONB).

The landscape has been shaped by human activity since prehistoric times. A human skull found at Swanscombe, just outside the catchment, is one of the oldest human remains found in Britain and there have been many finds of palaeolithic artefacts, such as flint tools, in the area. More recent Bronze and Iron Age farmsteads are also relatively common. The area was heavily populated during Roman times particularly along the Darent and Cray valleys. The remains of a villa at Lullingstone form one of the most important surviving sites in this country from that period. In the early industrial period the rivers were an important power source for mills not just for corn but also other industries, such as gunpowder. Later, heavier industry was developed, particularly around Dartford, initially with engineering, papermaking and pharmaceuticals and more recently power generation.

These industries and other human activities make their impact on the environment through discharges to air, water and land. The main influences on air quality within the catchment are the industries situated along the Thames Estuary corridor, and transport related emissions, particularly close to the main roads (M20, M25, M26 and A2) running through the area. There are no major discharges into the Darent or Cray since domestic sewage from throughout the catchment is treated at Long Reach Works, near Dartford, which discharges into the tidal Thames. There are 63 licensed waste facilities in the Darent catchment. Landfill remains the principal means of disposal for domestic waste arisings.

Future development will continue to highlight the contrast between the relatively rural nature of the south of the catchment and the urbanised northern part. In the south outside the existing urban boundaries, green belt and AONB designations restrict development. In the north the catchment is at the heart of the Thames Gateway where numerous brownfield industrial sites have been designated for major regeneration. Developments already in place include Bluewater regional shopping centre, the nearby Darenth hospital and Crossways Business Park. Further proposals include the University of Greenwich at Joyce Green and possible follow on development in the catchment when the second phase of the Channel Tunnel Rail Link proceeds, just outside the LEAP boundary.

The aim of this LEAP is to provide the Environment Agency's framework for a sustainable future of the Darent Catchment, an area with important

environmental features that are recognised nationally, but subject to a wide range of pressures, both human and natural. This will take account of the need to protect and enhance the countryside to the south of the area whilst ensuring that the major developments in the north of the catchment are carried out in a sensitive way with as little impact on the environment as possible.

3. ENVIRONMENTAL ISSUES AND OPTIONS FOR ACTION

3.1 Introduction

This section of the LEAP details the environmental issues that the Agency considers need to be addressed within the Agency's future 5 year Action Plan for the catchment. This initial list of issues has been identified from an Agency review of the environment in consultation with the Area Environment Group (AEG) whose members represent a wide range of interests. The Agency has also considered the concerns of organisations with particular interests and responsibilities in the catchment.

Discussion meetings were held with the AEG, various departments of local authorities, and English Nature. The Agency also invited comment by correspondence with other organisations. Comments and ideas have been incorporated wherever possible and the Agency is grateful for the contribution of the time and effort of respondents and consultees. Appendix 1 lists those organisations that were contacted during this preliminary consultation.

The issues presented in this Consultation Draft are intended to encourage debate and seek your views on the environmental issues that face the Darent catchment.

3.2 Classification of issues

The issues are not arranged in order of relative importance but have been grouped in accordance with the Agency's nine principal concerns, as detailed in the Agency's *Environmental Strategy for the Millennium and Beyond*. Many of the issues are inter-related and this reflects the need for integrated environmental management. From the pressures identified in the Environmental Overview seventeen issues have been brought forward into the Consultation Draft for the following reasons:

- they are issues that are of particular significance to the Darent catchment that have not already been addressed on a strategic basis in the Kent Area LEAP;
- they are directly relevant to the Agency's responsibilities and are not being addressed by other organisations (e.g. local authorities);
- they are not matters that can be addressed by the Agency through its day to day responsibilities.

3.3 Options For Action

For each issue, a number of Options for Action have been proposed. Costing of actions has not been attempted for this draft but have been accorded High (H - above £250,000), Medium (M - £50,000 - £250,000), and Low (L - below £50,000). It has to be remembered that these are Agency costs. It can be assumed throughout that the "do nothing" option incurs no costs at present. This could be considered an advantage but it should be remembered that this is a short term situation and may only serve to delay costs until a later date when it will have to be resolved.

ISSUES SUMMARY

Environment Agency Concern*	Issue
Addressing Climate Change	1. Increased summer peak water demand arising from more extreme seasonal climate variation
	2. Impact of sea level rise on the effectiveness of flood defences
Improving Air Quality	Relevant issues already identified in the Kent Area LEAP
Managing Water Resources	3. Deterioration in the balance of water resources as a result of historic development of groundwater for public supply
	4. New economic developments are increasing the pressure on water resources in the Darent Catchment
Enhancing Biodiversity	5. The spread of invasive species through the Catchment
Managing Freshwater Fisheries	6. Excessive unlicensed fishing due to proximity to major urban areas
Delivering Integrated River-Basin Management	7. Loss of water from the catchment
	8. Impact of changing patterns of water abstraction
	9. Accessibility to water based recreation in the Darent Catchment for all people
	10. Management of Dartford Marshes
	11. Operation of weirs and sluices on the Darent
	12. Impact of creosote pollution and siltation at Broomwood Lake
	13. The need for wider adoption of best practice river management
Conserving the Land	14. Potential land contamination problems
Managing Waste	15. scrapyards and water quality
	16. Trans-frontier Shipments of Waste (TFS) at Thames Europort
	17. Flytipping
Regulating Major Industries	No issues identified beyond normal statutory duties.

* From: An Environmental Strategy for the Millennium and Beyond (Environment Agency 1997)

Issue 1: Increased summer peak water demand arising from more extreme seasonal climate variation

A forecast for South East England produced by the Climate Change Review Group suggests an increase in winter rainfall with correspondingly greater potential for aquifer replenishment but this benefit could be off set by hotter dryer summers bringing higher peak period demands on the public supply network. The result could therefore be a net decrease in the balance of resources with drier soils and depleted water table levels.

This effect has been anticipated in the Darent Low Flow Alleviation Scheme to the extent that the Action Plan (Issue 3) includes the facility for augmenting flow at times of severe drought by pumping water into the river from boreholes specially constructed for this purpose. Target flows and levels have been set at key locations and these represent thresholds for the maintenance and protection of the very important plant and invertebrate habitats within the river and associated lake areas. These constitute what has been termed the Environmentally Accepted Flow Regime (EAFR).

If the climate change predictions prove to be substantially correct then the Agency, in order to sustain the EAFR, will need to operate the augmentation boreholes more frequently and for longer periods than envisaged when the scheme was implemented.

Options for Action	Advantages	Disadvantages	Financial Cost	Potential Partners
Ensure that the action plan incorporates adequate drought contingency measures for maintaining river flows and lake levels under all but the most severe conditions.	Provides a secure and rational basis for management of low flows under drought conditions.	Additional operational management responsibility.	L	DETR
Do nothing.	No additional management commitment.	Failure to meet low flow targets under extreme drought conditions.	-	-

Issue 2: Impact of sea level rise on the effectiveness of flood defences

Current climate change models are indicating a rise in sea level of 4mm per year. In addition to this, a relative sea level rise due to the geological tilting of the British Isles means that the total sea level rise in the South East is 6mm per year. The Thames floodwalls are in mid life and their present maintenance needs and operational effectiveness require reassessment in view of this sea level rise.

The Agency's current assessment programme is:

- an asset survey being carried out to determine conditions of the Thames Tidal Flood Defence (TTFD) that will provide data for the Flood Defence Management System, which determines the justification and priority of maintenance and improvement works.
- a TTFD strategy being commissioned to determine the most effective way of managing the flood defences over 50 years.

NB: Earth embankment levels and condition are evaluated against climate change and land use change every 30 years (2000, 2030, 2060, 2090 etc).

Hard structure levels and condition are evaluated against climate change and land use change every 60 years (2030, 2090, 2150 etc), but many more regular checks are carried out.

Options for Action	Advantages	Disadvantages	Financial Cost	Potential Partners
Bring forward complete assessment to be carried out in conjunction with asset survey.	Reliable baseline information.	Cost Contrary to original design recommendations.	M	
Implement TTFD strategy.	More efficient and effective flood warning.	Cost.	M	Landowners/occupiers
Do nothing	No cost.	Potential flood risk harm to life and property.	-	

Issue 3: Deterioration in the balance of water resources as a result of development of groundwater for public water supply

Prior to the implementation of the Darent Low Flow Alleviation scheme, abstraction for the public supply from boreholes in the Chalk and the Lower Greensand aquifers underlying the catchment accounted for more than 2/3 of the average annual effective rainfall, most of which takes place during the winter months. The result has been a progressive depletion in water table levels with a corresponding reduction in the discharge of springs that would normally sustain the flow of the river during the summer and autumn. Average flows in the Darent fell to little more than 1/3 of what would be considered as normal for a river catchment of this size in its natural state; (during the long drought of 1989 -92 flows ceased altogether over long reaches between Eynsford and Dartford).

The cumulative impact of this general reduction in river baseflow has shown itself in a loss of species diversity to the extent that the Darent no longer displays the thriving plant and invertebrate communities that characterise a healthy chalk stream habitat. This has in turn reduced the amenity value of a popular local resort. It was for these reasons that the Darent was given high priority under the Agency's National Low Flow Alleviation Programme.

This year sees the completion of Phase I of the Action Plan, which commenced in 1994. Phase I has achieved about half the target flows necessary to secure an environmentally acceptable flow regime. This has been achieved partly by reducing the quantities of groundwater abstracted by Thames Water from the Greensand and Chalk aquifers underlying the river catchment and partly by the construction of flow augmentation boreholes sited near the river and operated as "artificial springs" to sustain flows at times of exceptionally low water table levels.

Work is still necessary to ensure that, other than at times of severe drought, there will always be sufficient flow in the river to support a healthy stable "chalk stream" habitat with its characteristic diversity of plant and invertebrate species. This will be the objective of Phase II, which it is hoped will see the return of a fully sustainable brown trout population. The most likely course of action is one which has been given the full support of Thames Water and South East Water and this will involve further substantial reductions in the quantities of water pumped from boreholes at sensitive locations in the valley. Losses in public supply capacity incurred by the companies will need to be made up from new sources outside the catchment. One possibility now under investigation would involve the construction of new chalk boreholes in the vicinity of Swanscombe Quarry where large volumes are currently pumped to waste to prevent flooding of the excavation works. This proposal has the support of the department of the Environment Transport and Regions (DETR) as a wholly sustainable option which would bring the additional benefit of materially reducing wastage of the area's water resources.

Options for Action	Advantages	Disadvantages	Financial Cost	Potential Partners
Implement Phase II of the Darent Action Plan.	Flows in the River Darent will be maintained at environmentally acceptable levels. Acceptable bio-diversity will be restored to the river. Economically sustainable.	Relatively small recurrent costs associated with river augmentation schemes. Relocation of Water Company abstraction sources may occasionally create new difficulties elsewhere.	L	Water companies DETR OFWAT
Do nothing.	No further expenditure.	River flow will fail to reach environmentally acceptable levels for significant periods. Environmental damage will persist. The existing spend of £7.5M by water companies and the Environment Agency will have been wasted.	-	-

Issue 4: New developments are increasing the pressure on water resources in the Darent Catchment

Recent and planned developments in North West Kent are increasing water demand in the Dartford and Gravesham Borough areas, although this is partly offset by a local decline in consumption for industrial purposes. These developments include the Bluewater Retail Park, the Crossways Business Park and a new hospital and university. There are proposals for an International Railway Station at Ebbsfleet, redevelopment of the BCI chalk quarries at Swanscombe and the construction of approximately 10,000 housing units.

The Darent Action Plan is aimed at reducing the impact of groundwater abstraction on the low flow regime of the river and, as explained under Issue 3, the resulting loss of public supply capacity will need to be made up by the creation of new sources elsewhere, most likely within the area of Swanscombe chalk quarry. Work is now in progress on the assessment of the water resources of the Swanscombe area and this information will ensure that future groundwater abstraction is sustainable and presents no threat to the environment. We will, in this respect, need to give special attention to the protection of designated wetland areas.

Options for Action	Advantages	Disadvantages	Financial Cost	Potential Partners
Assess groundwater resource potential of the Swanscombe Chalk block and establish limits for future development compatible with regional strategy.	Provides a secure basis for the sustainable management of water resources.	Risk that available water resources found to be inadequate to meet projected demand.	L	Water companies BCI DETR EN
Do nothing.	No cost.	Failure to secure the proper use of resources.	-	-

Issue 5: The spread of invasive species through the catchment

The native white clawed crayfish was common more than thirty years ago but the population collapsed due to the fungal *crayfish plague*, which was introduced into Britain with signal crayfish and Turkish swamp crayfish by commercial crayfish farmers. The white clawed crayfish is now subject to EC Directive protection and the only residual stock of the species in the catchment is to be found at Dunton Green, Sevenoaks. Consideration should be given to the needs of white clawed crayfish when constructing in-stream habitat for fisheries improvement, and any other changes that may affect the river habitat.

Chinese mitten crabs (*Eriocheir sinensis*) have been unwittingly imported to estuarine and freshwaters in the South East of England having been discharged in ships ballast water to the Thames estuary. The crabs have spread into the lower reaches of the Rivers Cray & Darent including some of the connected lakes. These crabs are aggressive and may destroy the native white clawed crayfish in the catchment. They may also be a problem for the flood defences due to their burrowing habit undermining the riverbanks.

The spread of invasive species and diseases present problems particularly:

- Chinese mitten crabs which may cause damage to riverbanks, compromise flood defences and increase predation of the native white-clawed crayfish;
- the white-clawed crayfish is at threat of mass mortality from the introduction of *crayfish plague*, a fungal disease, via the non-native signal crayfish or from spores transferred on wet footwear or nets;
- the spread of alien plants, particularly Japanese knotweed, Himalayan balsam and giant hogweed;
- the introduction of exotic fish species and large carp to fishing lakes which may result in the introduction of fish diseases and the possibility that these fish will escape to the rivers and interfere with the natural balance of species.

Japanese knotweed, giant hogweed and Canadian balsam were unwittingly imported to estuarine and freshwaters in ship's ballast have invaded and are now widespread. The Environment Agency is charged with monitoring their expansion and encouraging others to control them. Giant hogweed has a particularly toxic sap that can cause burns and blisters to the unwary.

Options for Action	Advantages	Disadvantages	Financial Cost	Potential Partners
Assist landowners, local authorities, fishing clubs and other interests in identifying and implementing a strategy for the control of giant hogweed and other invasive species.	Preservation of native species and habitats. Protect angling and recreation interests.	Cost and resources.		EN Landowners Angling clubs Fisheries LAs
Monitor the spread of alien species that live in or near water.	Provides baseline information in order to determine policy.	Resources.	M	Angling clubs Landowners EN
Destroy the mitten crabs.	Only limited control expected to be possible. Possible legal implications.	Resources.	M	Angling clubs Landowners
Monitor the spread Of the crabs.	Improved knowledge of the extent of the problem.	Resources.	L	Angling clubs Landowners

Options for Action	Advantages	Disadvantages	Financial Cost	Potential Partners
Improve habitat for the white clawed crayfish.	Construct appropriate in-stream habitats.	Resources.	L	Landowners
Do nothing.	No cost.	Progressive invasion. Threat to public health. Possible extinction of BAP species. Possible undermining of flood defence embankments.	-	-

Issue 6: Excessive unlicensed fishing due to proximity to major urban areas

A large proportion of the anglers who fish in Kentish waters live in suburban London. With respect to travel time and cost, the Darent and Cray Valleys are their local playgrounds and large numbers of anglers fish there. As a result the occurrence of unlicensed anglers, which also applies to some extent throughout the Kent Area, is a particular problem in the Darent Catchment.

Options for Action	Advantages	Disadvantages	Financial Cost	Potential Partners
Increase and improve licence checking and communication systems.	Maintain control of fisheries. Addition to income stream.	Resources.	M	Fishing interests Landowners
Extend the "Waterwatch" scheme to the Darent catchment.	Better communications and intelligence.	Resources.	M	Fishing interests Landowners
Do nothing.	No cost.	Potential adverse environmental impact due to uncoordinated operation. Loss of revenue.	-	-

Issue 7: Loss of water from the catchment

Almost all the wastewater generated within the Darent catchment is sewered outside the area for treatment and discharge. Consequently, virtually none of the groundwater abstracted is returned to benefit the water balance. Investigations in the early 1990s leading to the formulation of the Darent Action Plan included, among the options considered to restore low flows, the local treatment and discharge of waste water. However it was discounted on economic grounds and because of the relatively modest volume of treated water that would become available.

Large trunk sewers run down the Darent and Cray valleys, often parallel and close to the rivers. There is a possibility that the older trenches, and indeed the sewers themselves, inadvertently drain groundwater from the vicinity of the rivers thereby inducing losses from the rivers.

Options for Action	Advantages	Disadvantages	Financial Cost	Potential Partners
Re-evaluate options for waste water treatment and return flow to the river.	Sustainable return of flow to river.	Relatively expensive. Risk of deterioration in river water quality.	H	Water companies DETR OFWAT
Investigate and eliminate drainage effects of trunk sewers.	Potential reduction in river bed losses.	Maybe a red herring and therefore could result in wasted effort. Relatively high cost of detection and tracking surveys.	H	Water companies
Do nothing.	No cost.	A potentially sustainable opportunity to boost river flows would be lost. Large capital expenditure by other parties may be compromised. Environmental damage may arise in the Swanscombe area.	-	-

Issue 5: Impact of changing patterns of water abstraction

Background growth in demand for public water supply is intensified locally by new and proposed infrastructure developments in the Thames estuary area, although most of these are located immediately outside the Darent and Cray catchments.

This upward trend has been offset by the decline in industrial abstraction, notably in the lower Cray valley at Crayford and Bexley. This decline may also have contributed to the localised instances of groundwater flooding reported in recent years. In the Darent valley also, there are major reductions in abstraction in progress as the Darent Action Plan is implemented. Conversely, in the upper parts of the Cray valley at Orpington and Sidcup, the upward trend has been steepened due to temporarily increased groundwater abstraction to partially offset the planned losses of supply from the Darent.

The issue therefore centres on maximising the benefits of lower abstractions in the Darent valley and minimising the disbenefits of increased abstractions in the Upper Cray and Thames estuary area.

Options for Action	Advantages	Disadvantages	Financial Cost	Potential Partners
Assess risks to affected areas and formulate water resources management plan.	Sustainable development.	Resources.	H	Water companies DETR OFWAT
Do nothing.	No cost.	Risk of environmental damage in the upper Cray valley and Swanscombe area.	-	-

Issue 9: Accessibility to water based recreation in the Darent Catchment for all people

There are a large number of formal and informal sites in the catchment adjacent to water providing recreational opportunities, some of which are open to the general public and others restricted to members. Examples include:

- Darent Valley Path
- Cray Valley Path
- Lullingstone Visitor Centre
- Lullingstone Roman Villa
- Chipstead Sailing Club
- Eynsford Ford, Farningham Bridge & Franks Lane
- Ruxley Lake
- Sutton at Hone Lakes
- Thames Estuary and Dartford Creek Flood Walls

Due to the large urban population nearby, many of these sites come under extreme pressure from large numbers of vehicles creating traffic and parking problems. Illegal entry to private facilities, in particular fishing lakes, inappropriate uses such as horseriding, mountain biking or driving vehicles in the river and demands for additional uses of flood defences, which may be incompatible with their maintenance, have adverse impacts. Access needs to be managed to meet the demand for recreation in a way that does not damage these habitats and the environment in general.

The Agency also encourages the development of access for fishing and there is a need for quality fishing accessible to people living in the area with varying degrees of mobility, especially in the urbanised London fringe within the catchment. Whilst opportunities for fishing appear to be extensive in both the river and adjacent gravel pits, most of the waters are controlled by angling associations. There is a particular need to open up access for casual anglers and encourage the development of facilities for physically disabled people.

Options for Action	Advantages	Disadvantages	Financial Cost	Potential Partners
Support provision of facilities in appropriate locations to allow enjoyment of the environment with minimal negative impact need some local examples	Improve enjoyment of the environment. Reduce the harm of uncontrolled access.	Resources.	L	LAs KCC NWKCP Landowners Local interest groups
Establish and participate in consensus building group amongst recreation groups.	Resolution of conflicting demands from different groups.	Resources.	L	Recreation groups
Develop and implement strategy and liaison procedure for Agency owned or maintained flood defences which seeks to maximise opportunities whilst minimising potential conflicts.	Potential to resolve conflict and improve education opportunities	Resources.	L	LAs KCC SUSTRANS EA Thames Region
Highlight alternative day permit waters in outer London in "Fishing in the South."	Inexpensive use of existing publication.	Delay until next edition published (2000).	L	Angling clubs Fisheries owners EA Thames Region
Improve access and construct safe fishing platforms.	Extend enjoyment of the environment.	Resources.	M	Angling clubs Landowners LAs
Do nothing.	No cost.	Degradation of habitat and associated remediation costs.	-	-

Issue 10: Management of Dartford Marshes

There are extensive proposals for development in the catchment, particularly on the Thames Marshes, with implications for flood plain protection, surface water runoff, pollution prevention and conservation habitat protection. The drainage of the marshes relies on gravity which may not continue to be sufficient as sea levels rise or as further land is developed. The situation may be further complicated by developers using land raising to provide flood protection.

Particularly for conservation aspects, Dartford Marshes are similar in character to Crayford Marshes on the western side of Dartford Creek under the jurisdiction of the Agency's Thames Region.

Appropriate management strategies for a range of uses of the marshes need to be developed and implemented taking account of:

- the effect on drainage of the Thames Marshes of new developments, land raising or rising sea level;
- the vulnerability of water levels on Dartford Marshes to changes in the flow of the River Darent;
- the instability of the Dartford Creek channel across the marshes and the impact of possible resolution such as keeping the Dartford Creek Barrier permanently closed;
- the desirability of treating Dartford and Crayford Marshes as one unit with common proposals.

Options for Action	Advantages	Disadvantages	Financial Cost	Potential Partners
Develop Management Plan for the Dartford Marshes.	Provides a coherent strategy for future management.	Resources.	M	Landowners LAs Conservation organisations EA Thames Region EN
Encourage developers to design revised drainage arrangements.	Identifies best possible drainage solutions.	Cost to developer.	L	Developers
Determine revised drainage methods.	Identifies best possible drainage solution.	Resources.	M	Landowners
Install pumps.	Maintains drainage at all water level differences.	Ongoing operating costs.	H	Landowners

Options for Action	Advantages	Disadvantages	Financial Cost	Potential Partners
Review operation of Dartford Creek Barrier.	Provision of permanent standing water behind the barrier with potential recreational opportunities.	Possible adverse impacts upon fish and invertebrate fauna. Need for channel maintenance.	L	Landowners
Do nothing.	No cost.	Potential increase in flood risk. Deterioration of habitats.	-	-

Issue 4: Operation of weirs and sluices on the Darent

There is no clear management strategy for the maintenance, replacement or operation of the large number of structures including sluices and weirs that affect flow control in the catchment. Many of the structures need major repairs or maintenance, which is often the responsibility of the riparian owner. Whilst the Environment Agency has little direct responsibility, the operation of these sluices often has a significant effect on flood defence.

Apart from the operational impact, some of the weirs act as significant barriers to migrations of fish or other aquatic species to the detriment of biodiversity.

Options for Action	Advantages	Disadvantages	Financial Cost	Potential Partners
Commission a fluvial flood defence strategy for the Darent.	Clear understanding to develop these issues.	Resources.	H	Property owners
Develop and implement a local Action Plan.	Effective management.	Resources.	H	Property owners
Agree operating procedures with owners.	Improve flood defence operations and reduce flood risk.	Resources.	L	Property owners
Do nothing.	No cost.	Risk of deteriorating structures causing localised flooding.	-	-

Issue 12: Impact of creosote pollution and siltation at Broomwood Lake

Broomwood Lake is progressively silting up over a bed polluted by creosote from industrial operations that have now ceased. The lake acts as an on-line balancing pond to absorb surface water run-off and to minimise flooding downstream. The lake is losing its effectiveness due to the reduced volume caused by siltation.

The silt has blanketed the creosote and an example of an important habitat, a swampy alder / willow carr, is developing naturally at the head of the lake. Dredging the lake to restore its original flood defence purpose would probably release the creosote to the river with serious polluting effects.

Options for Action	Advantages	Disadvantages	Financial Cost	Potential Partners
Investigate pollution alleviation measures applied in similar circumstances.	Prepared for any corrective action.	Resources.	L	
Apply pollution alleviation measures to remove creosote.	The danger of further pollution is removed.	Danger of releasing creosote into the Cray and destroying fisheries.	H	
Do nothing.	No disturbance of pollution. Creation of valuable carr habitat.	Loss of flood capacity. Potential pollution risk from large flood events.	-	-

Issue 13: The need for wider adoption of best practice river management

It is important that flood defence bankside maintenance work is carried out in a sensitive manner to preserve riparian vegetation that forms important aquatic environments. In addition this vegetation acts as a buffer strip giving added protection to the river against the adverse effects of diffuse pollution coming from the surrounding environment.

A demonstration length is in place at Westminster Mill, Horton Kirby, where best practice river management of the bankside is carried out by the Agency in partnership with local landowners. This sets an example that could be adopted more widely.

Options for Action	Advantages	Disadvantages	Financial Cost	Potential Partners
Introduce best practice on more lengths of the Darent.	Improve fishery / crayfish quality with habitat enhancement structures.	Resources. May increase flood risk.	M	NWKCP Angling clubs Landowners
Trial other techniques along selected stretches.	Provides opportunity to optimise river management.	Resources.	M	Landowners
Do not continue best practice anywhere.	Low cost.	Reduction in environmental value.	L	
Do nothing (continue best practice on demonstration lengths only).	No cost.	No further improvement.	-	-

Issue 14: Potential land contamination problems

The legacy of old industrial use in the catchment may have led to localised pockets of land contamination sites. In many cases potential pollutants become immobilised and avoiding disturbance is the most appropriate way of avoiding pollution (see Issue 12).

Where there is a clear threat or evidence of harm to the environment the Agency will take appropriate action within its remit. In other cases there is no firm evidence of harm or pollution but there is subjective evidence that there is an environmental problem, possibly related to contaminated land. One example of this is a closed landfill site near the River Darent at Otford, where historic leachate containment problems do not appear to have impacted the water quality of the Darent.

Options for Action	Advantages	Disadvantages	Financial Cost	Potential Partners
Identify and monitor sites that could be affected at a low level by land contamination.	Better knowledge of the problem.	Resources.	L	Landowners
As above plus develop Action Plan.	Identify options for resolution.	Resources.	M	Landowners LAs
As above plus implement Action Plan.	Opportunity to completely resolve problem.	Resources.	H	Landowners LAs
Do nothing.	No cost.	Potential pollution problem remains ignored.	-	-

Issue 15: Scrapyards and water quality

In Kent there are approximately 200 sites that will require inspection as part of a National Metal Recycling Project for scrap. At present it is not clear how many of these sites are in the Darent Catchment.

Scrapyards have the potential to affect the quality of groundwater, for which the catchment is particularly reliant for its water supplies. It is also important to maintain the high quality of the water in the rivers to maintain their conservation and fisheries value.

The full effect of scrapyards in the catchment on surface and groundwater is currently unknown but the sites will need to have appropriate environmental control to prevent pollution, harm or serious detriment to local amenities. This may be achieved through compliance with the regime of waste management licensing.

Options for Action	Advantages	Disadvantages	Financial Cost	Potential Partners
Identify all scrapyards that could impact on water quality.	Determination of the scale of potential problems.	Resources.	M	
Undertake targeted pollution prevention campaign.	Has the potential to mitigate pollution quickly.	Resources.	H	
Do nothing.	No cost.	Potential pollution sources are remaining undetected.	-	-

Issue 16: Trans-frontier Shipments of Waste (TFS) at Thames Europort

Thames Europort is a known entry and exit route for the United Kingdom to and from Europe and the rest of the world for TFS waste. The majority of the shipments of waste passing through this port are Green Listed wastes but the exact volume and composition of this waste is unknown, although the actual volume is considered to be small, consisting mainly of scrap metal. Amber Listed waste (potentially hazardous) of unknown volume and composition is also imported through Thames Europort although none is processed in the LEAP Area

Random inspections at port facilities are required to monitor and regulate shipments of waste passing through Thames Europort to ensure that Green Listed wastes are destined for genuine recovery operations, accompanied by the appropriate paperwork and are suitable for inclusion on the Green List (i.e. clean and uncontaminated).

Options for Action	Advantages	Disadvantages	Financial Cost	Potential Partners
Determine the scale of imports.	Better understanding of the scale of the problem.	Resources.	L	
Introduce routine inspection facilities at the port.	Allow inspection of shipments avoiding pollution risks.	Resources.	M	Europort
Do nothing.	No cost.	Potential pollution sources remain undetected.	-	-

Issue 17: Flytipping

There is subjective evidence, including observations by Agency staff, of extensive flytipping close to the urban fringe. This ranges from commercial waste illegally diverted from licensed landfill sites to private individuals failing to use civic amenity sites. There have been concerns that the latter problem may be exacerbated by the residence requirements introduced at civic amenity sites along the Kent / London Borough boundary and height barriers introduced at some sites to stop commercial vehicle access, which can restrict the disposal of *bona fide* household waste.

In areas where flytipping continues to be a major problem the Agency will take evidence if possible and look to take formal action where appropriate. The Agency has no direct, statutory duty to take action on flytipping, unless it has the potential to pollute, but within its aim of protecting and enhancing the environment, encourages a joint response with local authorities.

Options for Action	Advantages	Disadvantages	Financial Cost	Potential Partners
Monitor the extent of flytipping to build up an accurate picture of the extent of the problem.	Better understanding of the problem.	Resources.	M	LAs
Target problem areas by joint campaigns with and undercover operations.	Successful prosecution of offenders should have a deterrent effect.	Resources.	H	LAs
Do nothing.	No cost.	The problem may get worse with the potential for serious pollution risks.	-	-

4. A BETTER ENVIRONMENT THROUGH PARTNERSHIP

4.1 Introduction

The Agency is well placed to influence many of the activities affecting the environment through the Environment Act 1995 (EA 95) and other associated legislation. This section examines the major opportunities for the Agency to address environmental issues through partnerships with others.

The Agency must work in partnership with others to ensure that where appropriate the options for action included in Section 3 become real actions and are implemented so that the environmental issues are addressed.

Close links are already established with local authorities, water companies, industry, farmers, landowners, conservation bodies, angling clubs and recreation groups. New partnerships will be sought, both with these organisations and others. It is hoped that this draft LEAP will help us to achieve even more by working closely with others to address issues in the Darent Catchment and secure a stronger basis for environmental protection and enhancement.

4.2 Partnership Opportunities

4.2.1 Air Quality

Kent Air Quality Partnership

EA 95 Part IV places responsibility for local air quality management on the local authorities. They are required to carry out a three stage review and assessment of air quality within their boundaries, taking into account factors from neighbouring areas. The Agency is a consultee to this process. The review must assess whether it is likely that air quality objectives laid down in the Air Quality Regulations (SI 1997 No 3043) will be complied with by the 31 December 2005. If it is likely that one or more of the objectives will be breached the local authority is required to designate that area where the breach is likely to occur as an air quality management area. An action plan must be prepared which sets out the measures required to achieve these objectives.

The Agency's role is one of liaison, support, technical consultation and provision of data relating to Part A IPC processes. Part B processes (those with lower potential to pollute) are already regulated by local authorities under the Local Authority Air Pollution Control (LAAPC) provisions of Environmental Protection Act (EPA) 90 Part 1.

The Kent Air Quality Partnership is an existing forum that promotes co-operation and co-ordinated action on air quality issues. It is the custodian of an

emissions inventory and air quality model which are now being used to facilitate member local authority Air Quality Reviews. The Agency is a full member of the partnership and Kent County Council (KCC) provides secretarial facilities.

The air quality model is also used by KCC to assist with planning decisions by evaluating the impact of proposed developments.

London Boroughs

Thames Region of the Environment Agency liaises with the London Boroughs, organised as five cluster groups, in a similar way to the Kent Area involvement with the Kent Air Quality Partnership.

4.2.2 Water Resources

The Agency is committed to water-demand management and will work closely with water companies and developers, local authorities and relevant organisations to promote the efficient use of water.

The Agency acknowledges that new resources may be needed in the future and supports a twin track approach of planning for water resource development alongside the promotion of demand-management measures. The Agency seeks to influence planning decisions for new development by encouraging the inclusion of water-conservation measures in new properties, particularly in areas where water resources are under stress, and by ensuring that planning authorities allow for the lead time for resource development.

South East Water Forum

The Environment Agency works closely with the water companies in the Kent Area through the South East Water Forum in order to manage water resources in the area to achieve the proper balance between water development objectives, and the needs of the environment.

South East Region Strategy Group

The Strategy Group is comprised of the water companies, Environment Agency, OFWAT the unitary authorities and local authorities. The Group is currently developing a regional water resources strategy for South East England that will address demand management and resource development across the region.

Water Companies

Specifically within the Darent catchment, the Environment Agency has entered into partnership with two water companies, Thames Water and South East Water, to restore environmentally acceptable low flows to the river, but at the

same time safeguard public water supplies. This is being achieved through the implementation of the Darent Action Plan 1994-2005. The Plan provides for the relocation of substantial groundwater abstraction capacity outside the catchment, and also provides flow augmentation from bankside boreholes when necessary. The Plan also promotes efficient water use through demand management and leakage control.

Darent River Preservation Society

The Darent River Preservation Society (DRiPS) represents another partner in the implementation of the Darent Action Plan. For many years DRiPS has been effective at a political and communal level in advancing the Plan, and in some respects, informally auditing its progress.

4.2.3 Landscape

KCC produces River Landscape Assessments and Design Guidelines, which the Agency uses when working with local authorities and developers to conserve and enhance diverse river landscapes. The Agency will liaise with those organisations which have direct control over archaeological and heritage issues to assist in the conservation and enhancement of these interests.

4.2.4 Biodiversity

The Agency supports action to sustain or improve natural and man-made assets so that they are made available for the benefit of present and future generations. Many development schemes have significant implications for conservation. The Agency will work with developers, local authorities, conservation bodies and landowners to conserve and enhance biodiversity.

Fisheries Consultative Group

Many development schemes have significant implications for fisheries. The Agency will work with anglers, riparian owners, developers and local authorities to protect fisheries. In particular the Environment Agency works closely with the Kent Fisheries Consultative Association (KFCA) which contains representatives sitting on the Agency's Regional Fisheries, Ecology, Recreation, Navigation and Conservation Committee and the Kent Environmental Group (AEG). In turn the KFCA serves four catchment fisheries groups including one for the Darent. Representatives from the Darent Fisheries Group also sit on the DRIPS committee.

The North West Kent Countryside Project (NWKCP)

The NWKCP collaborative project has been in existence for over ten years led by KCC with funding from a number of local authorities and the Environment Agency. In that time a wealth of expertise and a broad base of local contacts has been established. The NWKCP works closely with landowners to enter land into MAFF's Countryside Stewardship Scheme. The Project's objectives include:

- conserving and enhancing river corridors, landscape features and their associated wildlife;
- increasing the public's knowledge and understanding of the countryside;
- assisting with the positive enhancement of the countryside and informal recreation opportunities within the Metropolitan Green Belt and urban fringes.

Previously the Agency provided funding for the Darent Valley Enhancement Programme through the NWKCP. Particular actions that will be implemented through liaison with NWKCP and landowners relate to the native white-clawed crayfish. The River Darent was once renowned for its crayfish population but many factors have contributed to the decline of the species in the river. These are known to include the crayfish plague, periods of low flow, and habitat modification. However, remaining populations have been identified and priority areas for enhancement targeted.

Managing the Marshes

Dartford Marshes is one of the last remaining fragments of grazing marsh and associated tidal mudflats within the M25. The Marsh contains a variety of species and habitats, including a thriving population of water voles. The Environment Agency is just one of the contributors of funding to support the *Managing the Marshes* conservation project. This support is specifically being used to produce and implement a Water Level Management Plan for this complex site. This plan will contribute to safeguarding the site's nature conservation interest by ensuring positive management of the area.

Farming and Wildlife Advisory Group

The Farming and Wildlife Advisory Group (FWAG) based at Wye operates in the Darent Valley providing conservation advice to farmers and advising on Countryside Stewardship applications.

4.2.5 Flood Defence

Planning liaison is the link between the Agency's functions and local authority planners. The Agency is committed to developing close working relationships

with local planning authorities to promote effective links between planning and environmental protection.

The Agency will encourage best practice, including source control measures and common standards, among local authorities and riparian owners to protect and enhance the environment.

4.2.6 Waste Management

The Agency will work with waste producers, the waste-management industry and local authorities to reduce the amount of waste produced, increase re-use and recycling and improve standards of disposal; and with users of the radio-active materials to ensure that radio-active wastes are not unnecessarily created, and that they are safely and appropriately disposed of.

Waste Minimisation

In Kent over the last two years a major project (the Medway and Swale Waste Minimisation Project including Glaxo Wellcome, Dartford) helping companies minimise waste at source has been backed by the Agency and Kent County Council. This project was co-ordinated by the Centre for Exploitation of Science and Technology and supported by the Government's Environmental Technology Best Practice Programme.

4.2.7 Recreation

The Agency will work with the Countryside Agency, English Sports, British Waterways, the Central Council for Physical Recreation and other recreational and amenity organisations to optimise recreational use of the water environment.

As well as a number of scenic riverside and Darent Valley walks there are lakes such as at Chipstead which provide a resource for dinghy sailing and canoeing.

4.2.8 Education

The Agency will seek to educate and influence individuals, groups and industries to promote best environmental practice. It will work in partnership with statutory and voluntary groups to carry out improvement projects and develop a wider public awareness of environmental issues.

The Agency is actively developing an education strategy to help schools and colleges at all levels of the curriculum. We encourage local liaison and project-related work with schools such as initiatives that assist schools with environmental enhancement projects.

Local Agenda 21

The Agency recognises the potential of Local Agenda 21 (LA21) and will continue to work with local authorities to ensure protection and enhancement to improve the local environment. A number of the local authorities in the Darent catchment have produced LA21 Action Plans. A number of the proposals for action within the LEAP could be implemented through LA21 Action Plans.

Kent Sustainable Business Partnership

The Agency is a partner in the Sustainable Business Partnership project led by Kent County Council, which is seeking to target small and medium business in the area.

4.3 Summary

Many other partnerships occur or are planned within the Agency, all of which are designed to deliver the mutual objectives of the partners involved. The Agency has a diverse network of relationships with many national, regional and local organisations as well as landowners and the general public. One significant area for future development will be the building of partnerships to aid environmental education. It is through these partnerships that we are able to contribute fully towards the goal of sustainable development.

APPENDIX 1:**DUTIES, POWERS AND INTERESTS OF THE ENVIRONMENT AGENCY**

The Environment Agency has a wide range of interests in the areas of water management, waste management and pollution prevention and control. Whilst many of these interests are supported by statutory duties and powers, much of the Agency's work is advisory, with the relevant powers resting with other bodies such as local planning authorities. The following list identifies the Agency's principal interests (full details are given in the Kent Area LEAP):

- Water Resources
- Flood Defence
- Water Quality
- Air Quality
- Integrated Pollution Control
- Radioactive Substances
- Waste Management
- Contaminated Land
- Conservation including landscape and archaeology
- Fisheries
- Recreation
- Navigation

APPENDIX 2: CONSULTATION UNDERTAKEN

In addition to extensive consultation with members of the Environment Agency, consultation was also undertaken with external consultees. These included the local authorities whose jurisdiction falls within the LEAP area, and various interest groups.

The following organisations were consulted during the preparation of this Local Environment Agency Plan:

CBI
CPRE Kent*
Country Landowners Association
Countryside Commission
Darent River Preservation Society
English Heritage*
English Sports Council (SE Region)
Farming and Rural Conservation Agency*
Kent County Council
Kent Fisheries Consultative Association*
Kent Wildlife Trust*
London Borough of Greenwich*
MAFF*
Managing the Marshes
Mid Kent Water
National Farmers Union (SE Region)
NW Kent Countryside Project
Port of London Authority*
RSPB
Salmon & Trout Association
South East Water*
Southern Water*
Sutton & East Surrey Water plc*
Tandridge District Council
Thames Water plc
Tonbridge & Malling Borough Council*

* = Response received

Meetings were held with the following organisations:

Dartford Borough Council
English Nature
London Borough of Bexley
London Borough of Bromley
Sevenoaks District Council

APPENDIX 3: GLOSSARY

Abstraction	Removal of water from surface water or groundwater, usually by pumping.
Aquifer	A layer of underground porous rock which contains water and allows water to flow through it.
Catchment	The total area of land which contributes surface water to a specified watercourse or water body.
Effective rainfall	The rain remaining as runoff after all losses by evaporation, interception and infiltration have been allowed for.
Flood plain	This includes all land adjacent to a watercourse over which water flows or would flow, but for flood defences, in times of flood.
Groundwater	Water which is contained in underground rocks (aquifers).
Internal Drainage Boards	Autonomous public bodies under the control of board members (including those elected by agricultural ratepayers and those nominated by local authorities), with responsibilities and powers for flood defence on ordinary watercourses (non-Main Rivers) under the Land Drainage Acts.
Sustainable development	'Development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs' (definition from World Commission on Environment and Development, 1987. Our Common Future - The Brundtland Report).

APPENDIX 4: ABBREVIATIONS

AEG	Area Environment Group
BCI	Blue Circle International
DETR	Department of the Environment, Transport and Regions
DRiPS	Darent River Preservation Society
EA	Environment Agency
EA 95	Environment Act 1995
EN	English Nature
FWAG	Farming and Wildlife Advisory Group
IPC	Integrated Pollution Control
KCC	Kent County Council
KFCA	Kent Fisheries Consultative Association
LAs	Local Authorities
LA21	Local Agenda 21
LAAPC	Local authorities air pollution control
LEAP	Local Environment Agency Plan
MAFF	Ministry of Agriculture, Fisheries and Food
NWKCP	North West Kent Countryside Project
OFWAT	Office of Water Services
TFS	Trans-frontier shipment
TTFD	Thames tidal flood defence

APPENDIX 5: FURTHER INFORMATION

Further information may be obtained from the following publications which have been produced by the Environment Agency (or its constituent organisations):

Action Plan for Land Quality, Bristol 1998.

An Action Plan for Recreation, Bristol 1998.

An Environmental Strategy for the Millennium and Beyond. Bristol. 1997

Darent Fisheries Strategy, Southern, 1997

Darent Action Plan, Southern NRA, 1993

Environment Agency Corporate Plan 1999-2000. Bristol. 1998

Fishing in the South. Southern Region, Worthing.

Guidance for the Control of Invasive Plants near Watercourses, Bristol.

Money for nothing - your waste tips for free, Bristol 1998.

Sustaining Our Resources. Southern Region, Worthing. 1997

Policy and Practice for the Protection of Floodplains. Bristol. 1997

Policy and Practice for the Protection of Groundwater. Bristol. 1998

Policy Regarding Culverts, Bristol, 1999

Saving Water: Taking Action. Bristol. 1998

Saving Water: On the Right Track. Bristol. 1998

The Agency's Contribution to Sustainable Development, Bristol. 1997

Viewpoints on the Environment. Bristol. 1997

Waste Minimisation and Waste Management, Bristol. 1997

Water Related Recreation Strategy for the Southern Region. Consultation Draft.

Southern Region/English Sports Council, Worthing. 1997

MANAGEMENT AND CONTACTS:

The Environment Agency delivers a service to its customers, with the emphasis on authority and accountability at the most local level possible. It aims to be cost-effective and efficient and to offer the best service and value for money.

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The 24-hour emergency hotline number for reporting all environmental incidents relating to air, land and water.

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