POOLE HARBOUR & PURBECK CATCHMENT MANAGEMENT PLAN CONSULTATION REPORT

NRA

National Rivers Authority
South Western Region
November 1995

Published November 1995

Cover Illustration : Corfe Castle and the southern shores of Poole Harbour © Dave Cooling

The NRA and the Environment Agency

The National Rivers Authority will form the major part of a new organisation which will have responsibilities for the environmental protection of water, land and air. The new Environment Agency starts its work of managing the environment in England and Wales on April 1 1996.

POOLE HARBOUR & PURBECK

CATCHMENT MANAGEMENT PLAN

CONSULTATION REPORT

YOUR VIEWS

Poole Harbour & Purbeck is the third Catchment Management Plan (CMP) produced by the South Wessex Area of the National Rivers Authority (NRA). CMPs will be produced for all catchments in England and Wales by 1998.

Public consultation allows people who live in or use the catchment to have a say in the development of NRA plans and work programmes.

This Consultation Report is our initial view of the issues facing the catchment. We welcome your ideas on the future management of this catchment :

- *Have we identified all the issues ?*
- *Have we identified all the options for solutions ?*
- *Have you any comments on the issues and options listed ?*
- *Do you have any other information or views which you wish to bring to our attention ?*

This is your opportunity to influence our future plans.

We look forward to hearing from you.

Howard Davidson
Area Manager, South Wessex Area

Please send your comments by 31 January 1996, preferably by writing to :

South Wessex Area Catchment Planner
NRA South Western Region
Rivers House
Sunrise Business Park
Higher Shaftesbury Road
Blandford Forum
Dorset DT11 8ST
Tel : 01258 456080 Fax 01258 455998

THE NATIONAL RIVERS AUTHORITY

The National Rivers Authority (NRA) is responsible for protecting and improving the water environment in England and Wales. We have a wide range of responsibilities which include :

- *improving water quality and controlling pollution*
- *managing water resources and controlling water abstraction*
- *protecting and improving fisheries and recreation facilities*
- *providing flood defences and flood warning systems*
- *conserving and enhancing the nature, landscape, archaeology, geology and amenity interest in inland and coastal waters*

To achieve its aims, we must work with or seek to influence central government, local government, industry, commerce, farming, environmental organisations, riparian owners and the general public.

Our mission is :

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 interest of all who benefit from and use rivers, groundwaters, estuaries, and coastal waters. We will be business like, efficient and caring towards our employees.

Our aims are to :

- *achieve a continuing overall improvement in the quality of rivers, estuaries and coastal waters, through the control of pollution*
- *manage water resources to achieve the right balance between the needs of the environment and those of abstractors*
- *provide effective defence for people and property against flooding from rivers and the sea*
- *provide adequate arrangements for flood forecasting and warning*
- *maintain, improve and develop fisheries*
- *develop the amenity and recreational potential of inland and coastal waters and associated lands*
- *conserve and enhance wildlife, landscape and archaeological features associated with inland and coastal waters of England and Wales*
- *improve and maintain inland waters and their facilities for use by the public where the NRA is the navigation authority*
- *ensure that dischargers pay the costs of the consequences of their discharges, and, as far as possible, to recover the costs of water environment improvements from those who benefit*
- *improve public understanding of the water environment and the NRA's work*
- *improve efficiency in the exercise of the NRA's functions and to provide challenge and opportunity for employees and show concern for their welfare*

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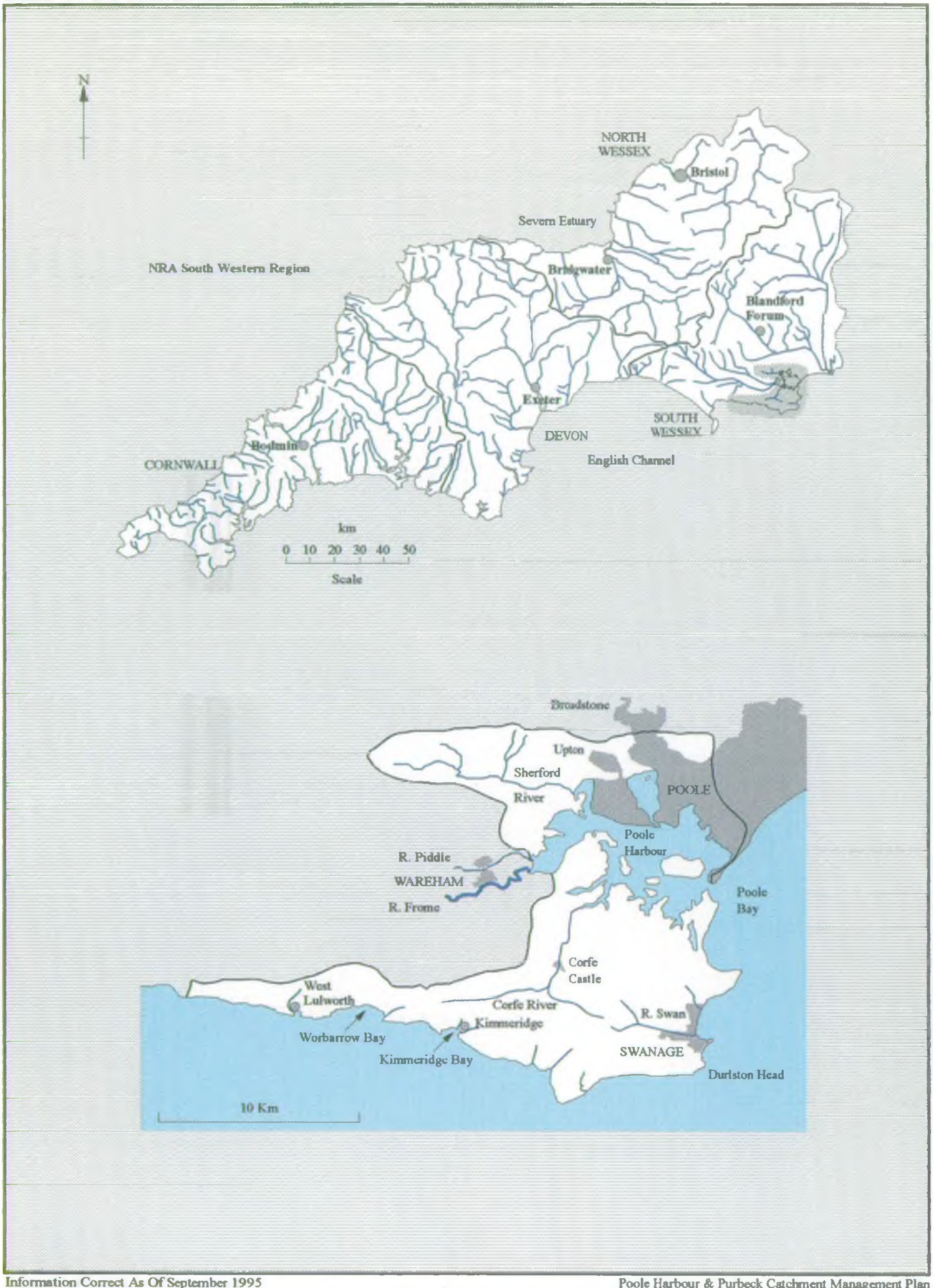
MAP 1 : POOLE HARBOUR & PURBECK CATCHMENT - LOCATION



1. CATCHMENT VISION

The Poole Harbour & Purbeck catchment is an area of high amenity and ecological importance, greatly valued by locals and visitors alike. Poole Harbour, with its variety of wetlands, and the Purbeck coast are protected by a number of conservation designations. The sheltered waters of Poole Harbour and the exceptional bathing beaches of the Purbeck coast make an important contribution to the local economy through tourism and recreation. Poole town is located on the northern shores of the Harbour, and includes the commercial port.

The ecological, recreational and commercial importance of the catchment means that the water environment is subject to considerable pressures. Our management of the catchment must recognise the needs of water users and the needs of the water environment itself, and seek to balance these needs.

Our vision for the catchment is towards a future where :

- *using the cleansing capacity of rivers and coastal waters to assimilate treated sewage effluents does not impair their considerable recreational and amenity potential*
- *abstractions of water are in balance with the ecological needs of rivers*
- *there is minimal risk to people and property from flooding*
- *the abundance and diversity of wildlife in the catchment is maintained and increased*
- *people's enjoyment and appreciation of the rivers and coastal waters continues to grow*

The realisation of this vision will involve the commitment of all those who have an interest in the water environment, and we recognise the importance of establishing links with the local communities and their representatives. It is important that local authorities include policies in their local plans which protect and enhance the water environment. We have a commitment to work with all relevant parties to implement the principles of sustainable development.

2. INTRODUCTION

2.1. Catchment Management Plans

Sustainable development can be defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs, and it is at the heart of UK policy on the environment. A recent government publication, Sustainable Development - The UK Strategy (HMSO 1994), recognises the inland freshwaters of the UK as a vital and highly valued component of the UK environment and ecology, along with the conflicts that may arise between different purposes and uses of the water and water environment.

An holistic approach to river management is required to plan for environmental sustainability and improvement. To this end, we have developed the concept of Catchment Management Plans (CMPs); these allow the full range of water management issues to be identified and considered within a geographical area which is both relevant and meaningful. CMPs are strategic in nature, since individual catchments cover large areas of land, often straddling local authority boundaries.

2.2. Planning in the Coastal Zone

The Poole Harbour & Purbeck CMP considers issues that affect both freshwater and the coastal zone. Above the low water mark, the Town & Country Planning System provides the means of regulating development and requires the local authorities to consult the NRA on planning issues which may impact on the water environment. Below the mean low water mark, regulation is sectoral and controlled by a number of government departments.

Historically there has been considerable concern about the sectoral approach in that it allows government departments to take a single issue view discouraging an integrated approach. The government has rejected a seaward extension of the planning system as the most effective means of controlling development in the marine environment. The view taken is that voluntary cooperation and self regulation, with local authorities taking the lead role, is the best way to control activity and development.

2.2.1. Dorset Coast Forum

In response, Dorset County Council have taken the lead role in setting up a Coast Forum for Dorset, consisting of local authorities, environmental agencies, central government departments, businesses and other interest groups. The aim of the Forum is to promote a sustainable approach to the management of the coastal zone and to develop an integrated coastal zone management policy.

2.2.2. Poole Harbour Aquatic Management Plan

The Aquatic Management Plan was produced by Poole Harbour Steering Group and aims to promote the sustainable use of Poole Harbour, and is a practical example of the multi-agency approach (Appendix 10.2 identifies Steering Group members with statutory responsibilities within the Harbour). Central to this aim is the recreational zoning plan, which provides a framework for the management of the harbour that balances the needs of recreational and commercial users with the needs of the environment and other legitimate interests. The Aquatic Management Plan is seen as a key part of an integrated management plan for the Poole Harbour area.

We are a member of the Dorset Coast Forum and Poole Harbour Steering Group and support the aims of these groups. The Poole Harbour & Purbeck CMP is intended to contribute towards this integrated management of the coastal zone.

2.3. The Consultation Report

This Consultation Report includes the following sections :

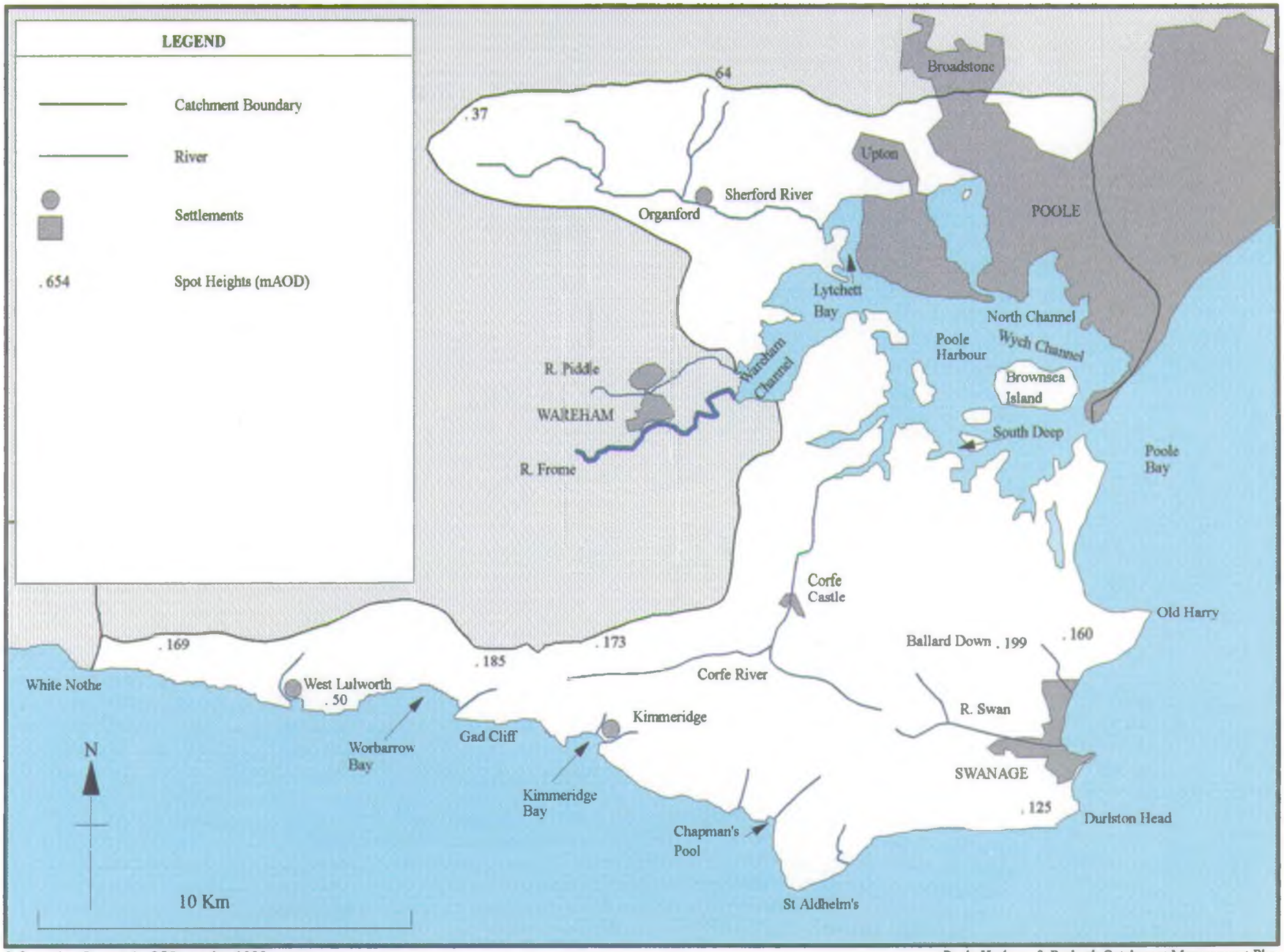
- ***Catchment Characteristics**, which provides a brief and general introduction to the catchment describing its key features*
- ***Catchment Uses**, which describes the activities that take place in the catchment which may influence the water environment or have requirements of it. We include notes about our role and objectives in managing or promoting these uses*
- ***Catchment Status**, where we assess the state of the catchment in relation to the water environment, and identify environmental quality targets where we can*
- ***Issues and Options**, where we identify situations where targets are not being met or we are failing to meet our objectives. Where possible we identify options and invite comment on the possible courses of action to resolve the issues*

2.4. The Action Plan

We will collate the responses to this Report and publish an Action Plan in March 1996. The Action Plan will be reviewed annually and a progress report published. The Plan will normally be subject to a major review every 5 years.

We have also set up a Steering Group comprising representatives of organisations and individuals representing interest groups in the catchment. They have helped us produce this Report, and will monitor our progress with the Actions.

MAP 2 : POOLE HARBOUR & PURBECK CATCHMENT



Information Correct As Of September 1995

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Poole Harbour & Purbeck Catchment Management Plan
NRA South Western Region

3. CATCHMENT CHARACTERISTICS

3.1. Catchment Description

Poole Harbour is centrally located on the South Coast of England, and is one of the largest and shallowest natural harbours in the world, with an area of approximately 38km^2 at high water spring tides despite land having been reclaimed on the northern margins in both historic and recent times. Within the Harbour there are three main channel systems, the Wareham and North Channel, the South Deep and the Wych Channel. There are several islands in the Harbour, of which Brownsea is the largest.

The Harbour is of exceptional ecological value and is protected by a multitude of conservation designations. Central to the ecological value are the intertidal mudflats, sandflats and marshes (80% of area at low water) and the diversity of shoreline ranging from reed and marsh to sand and shingle.

The main freshwater inputs to the Harbour are the Rivers Frome and Piddle, which enter at Swineham Point; these rivers are the subject of a separate CMP which was published in March 1995. There are two other significant freshwater inputs, the Corfe and Sherford Rivers.

The Corfe rises north east of Kimmeridge and runs parallel to the Purbeck ridge to Corfe Castle. Here it turns north to flow across the heath, being joined by a number of streams, and drains into the Harbour through the Wych Channel. The Sherford rises in the coniferous plantations of Wareham Forest and flows south-east to Organford, eventually draining to Lytchett Bay. Few watercourses cross the remaining catchment area; the Swan flows across the Isle of Purbeck into Swanage Bay and several smaller streams drain to the southern coastal strip, including those at Lulworth and Kimmeridge.

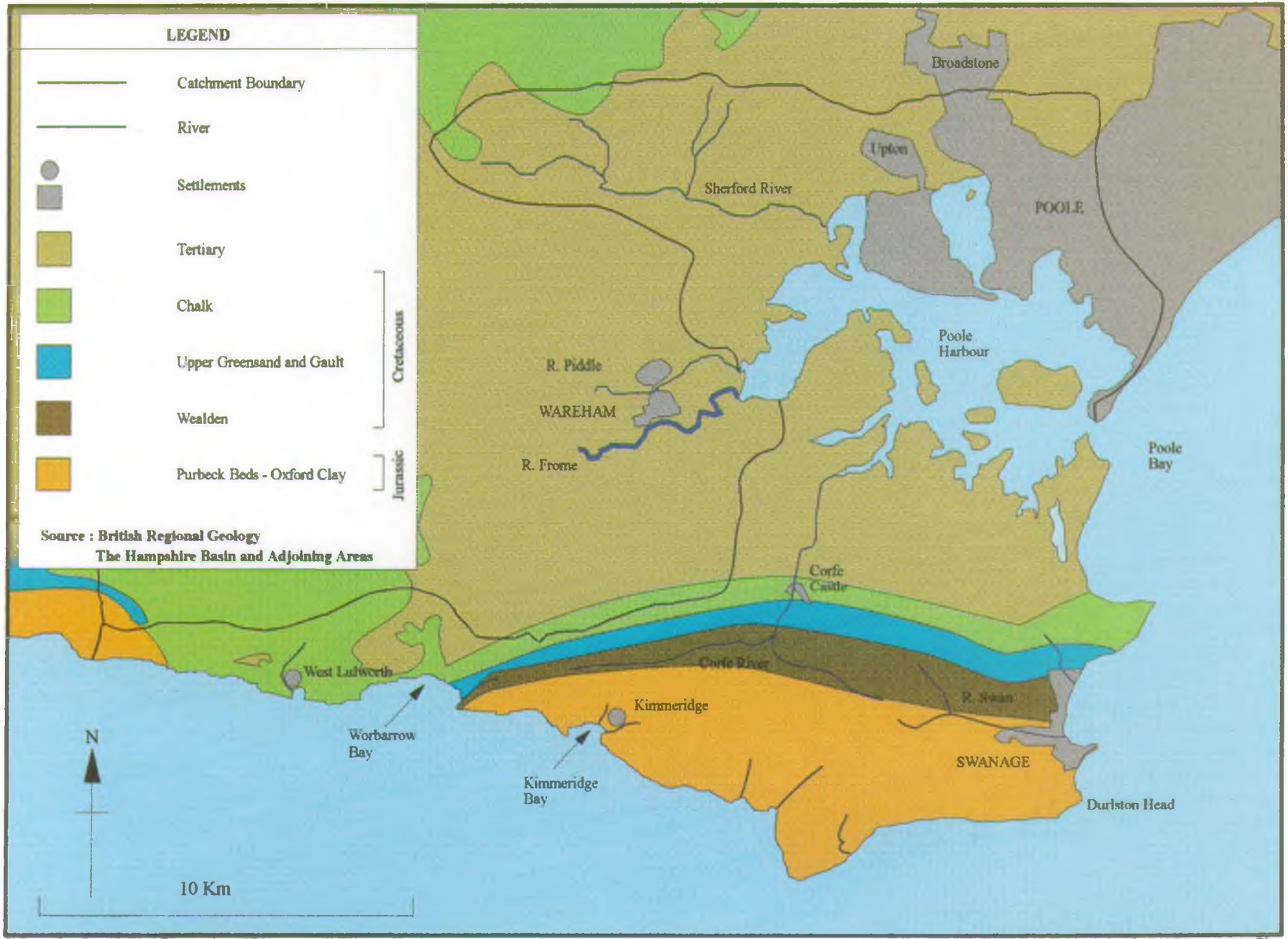
In the west of the catchment, the Purbeck coast between White Nothe and Gad Cliff is characterised by vertical cliffs topped with open grassland. Softer coastline is found between Gad Cliff and Chapman's Pool, East of St Aldhelm's the remains of Purbeck limestone quarries can be seen in the cliff faces. Chalk re-emerges at Ballard Down, north of Swanage, terminating at the well known landmark, Old Harry. From here the coast is lower-lying with bays and sandy beaches.

The catchment lies entirely within the county of Dorset, with a land area of 220km^2 and a population of 82,600 (1991 census). The part of Poole within the catchment has a population of 61,090; Purbeck is predominantly rural, the major settlement being Swanage (population 9,430). Other centres include Corfe Castle, West Lulworth, Kimmeridge and the military establishment at Lulworth Camp.

No specific population growth rates are available for the catchment, but forecasts for the Poole BC and Purbeck DC areas are. The catchment is within these areas but does not wholly coincide with them; for example Wareham is outside the catchment area but within the Purbeck DC boundary. Forecasts for Poole indicate growth across all age groups, from 137,900 (1994) to 140,000 (2001) and 145,400 (2011). Estimates for Purbeck indicate an increase from 44,000 (1994) to 46,200 (2001) and 49,700 (2011).

Several main roads cross the area including the A35 Bridport-Bournemouth road and the A351 connecting Poole and Swanage. Poole is linked to Hamworthy and Holton Heath by rail along the Weymouth-Waterloo line which crosses the catchment.

MAP 3 : POOLE HARBOUR & PURBECK CATCHMENT - GEOLOGY



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Poole Harbour & Purbeck Catchment Management Plan
NRA South Western Region

Industrial development in the majority of the catchment is light, with most activity being related to agriculture. The exception is the northern shore of Poole Harbour which has been the focal point for Poole's urban and industrial development.

3.2. Geology, Soil and Land Use

The low-lying northern part of the catchment on both sides of Poole Harbour is underlain by the Bagshot Beds, soft sandy strata of Eocene (early Tertiary) age. These give rise to acid, sandy soils characterised by heath and woodland habitats. Within the layers of sand are beds of ball-clay which are quarried and mined on a large scale for pottery manufacture and other industrial use. Below the Bagshot Beds come the London Clay, the Reading Beds, and the Upper Chalk. Near to Poole Harbour, the top of the Chalk is 100-200m below ground level.

To the south, these layers form into a fold that runs east-west and raises the chalk to form a high narrow ridge, the Purbeck Hills. Soils are calcareous and well drained with grass and woodland the dominant landscape features. This fold persists westward to Lulworth Cove and Durdle Door.

Further south, the strata bend back to near horizontal and include the Wealden Beds (clays and sands), the Purbeck and Portland limestones (quarried for building stone), the Portland Sands, and at the base the Kimmeridge Clay with its beds of oil-shale.

South of the Purbeck ridge there is a band of clay and loamy soil which is seasonally waterlogged; similar soils are found in the vicinity of Kimmeridge. The remaining area is dominated by shallow well- drained soils over limestone. Westward along the coast, soil type follows geologic formations with characteristic chalk soils at Lulworth and a change to loamy soils nearer Ringstead. Typical land uses are grass, woodland and cereal cropping.

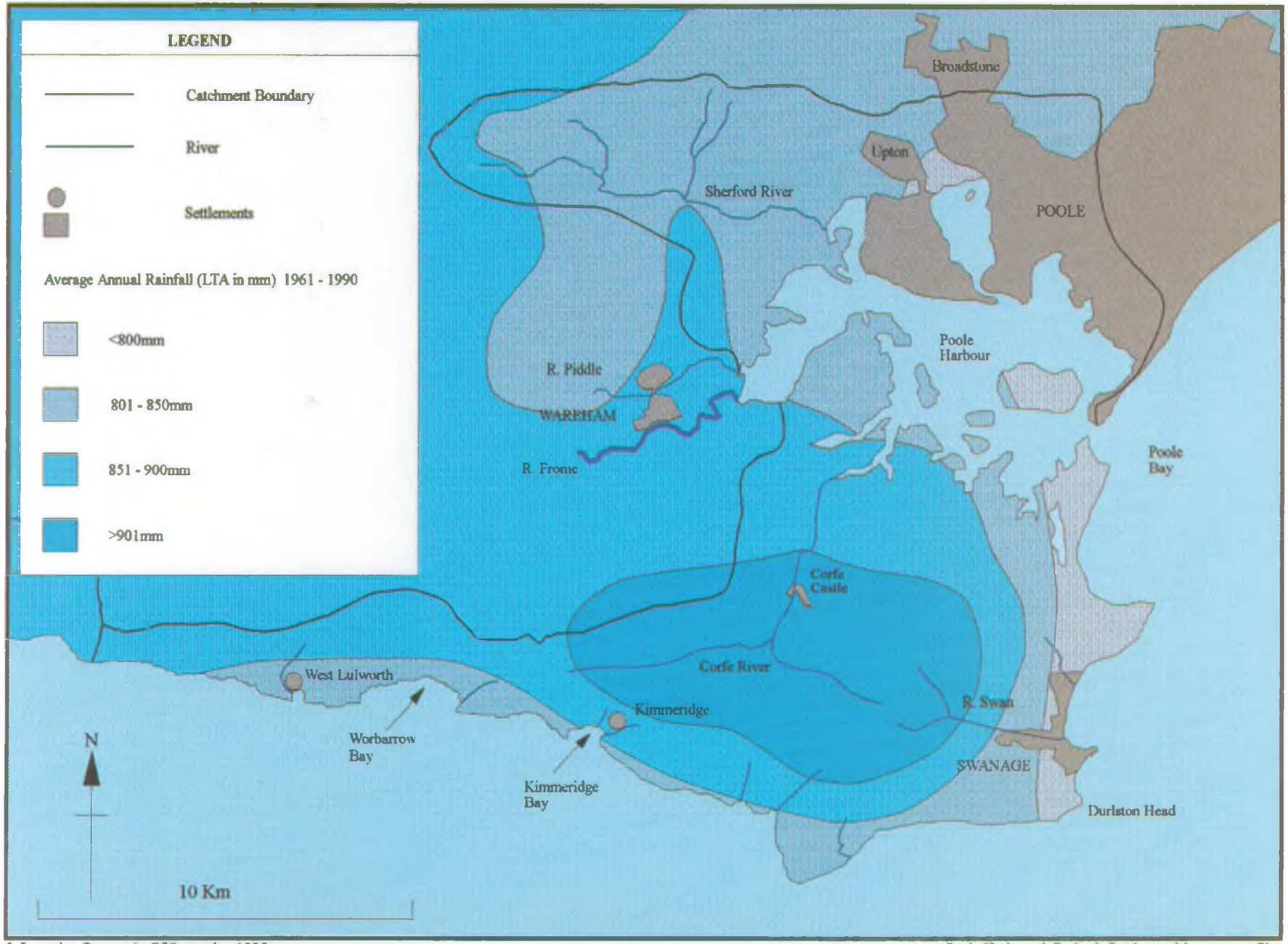
Along the south shores of Poole Harbour is the Wytch Farm Oilfield, the largest onshore oilfield in Britain. The oil does not come from the Kimmeridge Clay but from the Triassic Sherwood Sandstone at depths of about 1.5km. Within Poole Harbour itself, subtidal bedrock is rare, with the sandstone outcrop under the Haven Channel being the only one of significance. Shellgravel and sand are common substrates in the Harbour channels. Beach material is varied, including mud, sandy shingle and boulders.

3.3. Hydrogeology

The Bagshot Beds are a minor aquifer with water, sometimes under artesian pressure, in the sand layers. The Sherford rises from springs in the Chalk at Bloxworth in the north-west extremity of the catchment. Not all the Chalk groundwater breaks surface here; some of it continues south-eastward to feed submarine springs in Poole Bay, where the Chalk outcrops on the sea bed between Swanage and the Isle of Wight. Boreholes have been drilled recently near Wareham and at Bulbury and Lytchett Minster in the Sherford catchment to investigate the feasibility of intercepting this deep groundwater flow.

The Chalk of the Purbeck Hills is rather harder and less porous than normal because of the compressive forces involved in folding the rock. Nevertheless there are no surface streams on the Chalk outcrop. Groundwater flows laterally through fissures to spring sources at Corfe Castle and a borehole at Ulwell near Swanage, both used for public supply. At West and East Lulworth, the Chalk maintains its major aquifer status by supplying important boreholes and spring abstractions.

MAP 4 : POOLE HARBOUR & PURBECK CATCHMENT - HYDROLOGY



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Poole Harbour & Purbeck Catchment Management Plan

NRA South Western Region

South of the Purbeck Hills, relatively small amounts of groundwater are stored in the Lower and Upper Greensands and sandstones in the Wealden Beds. The Purbeck and Portland limestones are heavily fissured; water readily drains out of them to the south and east, as was demonstrated in 1989 when 2 tonnes of drilling mud escaped from a trial borehole for oil and travelled 1300m eastward through Portland limestone to a submarine spring in Durlston Bay. The Portland Sands are a minor aquifer but there is no significant groundwater in the Kimmeridge Clay.

3.4. Rainfall

Rainfall is measured daily at four Meteorological Office approved gauges within the catchment; these sites have been used to produce the long term annual average rainfall (1961-90). There are also telemetry raingauges at Poole and Swanage which can record rainfall intensity.

Map 4 shows how the average annual rainfall varies across the catchment. The highest rainfall, over 900mm, occurs in the south-east of the catchment; annual average rainfall decreases in all directions with the remainder of the catchment experiencing between 800-900mm.

3.5. River Flow

Flows of the Frome and Piddle are monitored near the Harbour at East Stoke and Baggs Mill respectively. Analysis of recorded flows from these stations can be found in the Frome & Piddle CMP. Their combined long term average daily mean flow is 8.910 cumecs. There are no permanent river flow gauging stations within this catchment.

Manual spot gaugings are taken periodically in the catchment and are supplemented by a level-only measuring weir at West Lulworth and the manual monitoring of four boreholes. Figure 1 shows sample hydrometric data for the catchment.

3.6. Tides

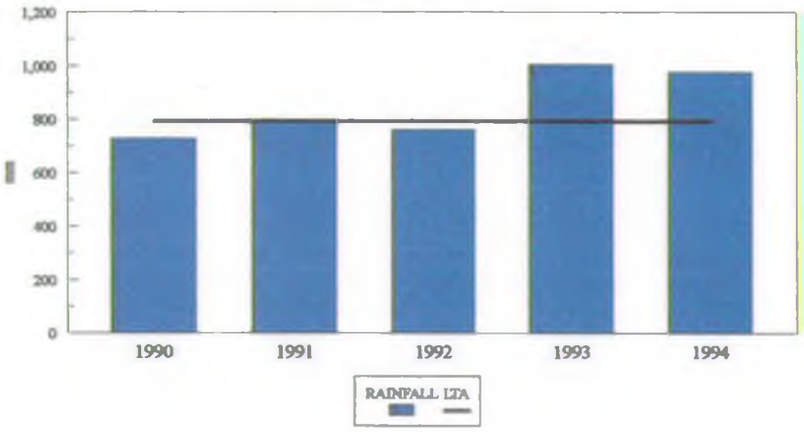
Tidal ranges throughout the catchment are small, and Poole Harbour is unusual in experiencing double high waters. Tidal currents are important for the movement of sediments in the Harbour, with speeds up to 4.5 knots on spring tides in the Haven Channel, and most channels exceed 0.5 knots. Circulation within the Harbour is complex, and flushing is likely to be highly variable depending on the location. Sediment load is low throughout the Harbour, mainly as a result of limited wave impact due to the sheltered nature of the Harbour.

Tidal Range (in m)	Entrance	Town Quay	Pottery Pier	Wareham (R. Frome)	Swanage	Lulworth
Mean Neap	0.4	0.4	0.4	0.5	0.4	0.5
Mean Spring	1.5	1.5	1.2	1.3	1.5	2.0

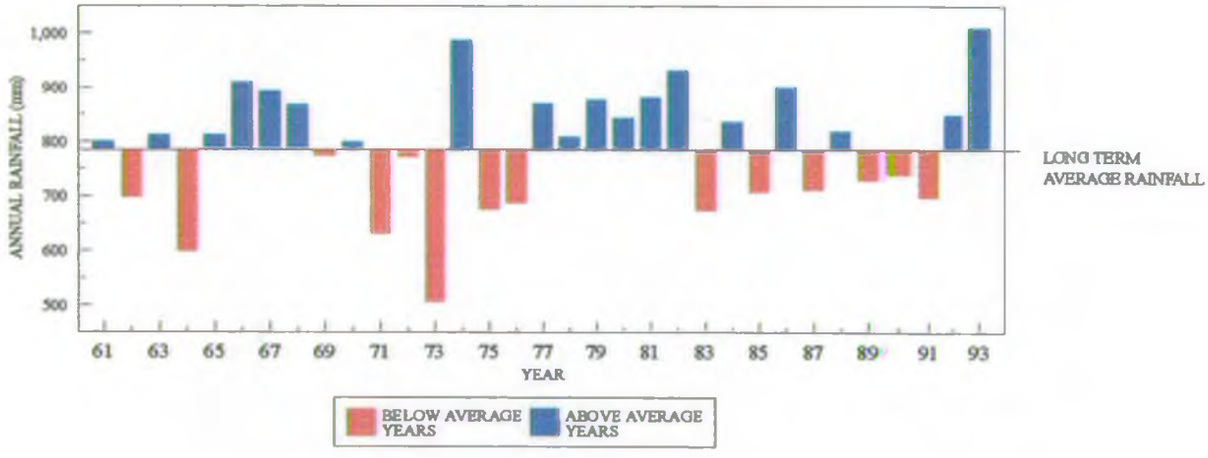
Data from 1995 Admiralty Tide Tables

FIGURE 1 : POOLE HARBOUR & PURBECK CATCHMENT - SAMPLE HYDROMETRIC DATA

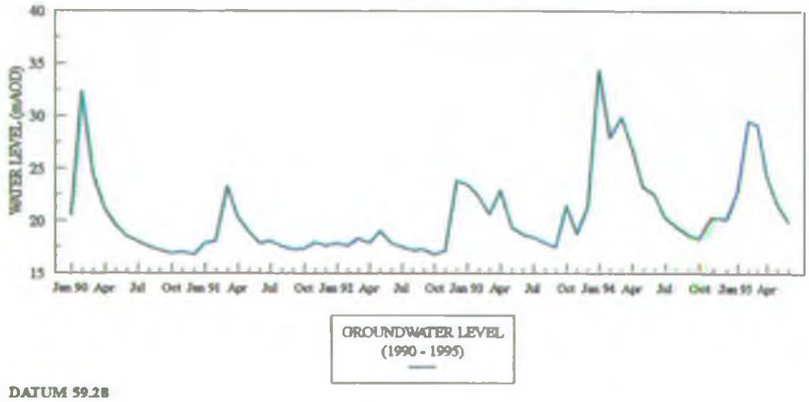
RAINFALL RECORD FROM POOLE NUFFIELD ROAD
(SZ 016 934)



SWANAGE RAINGAUGE STATION (SZ 030 794)
GRAPH OF ANNUAL RAINFALL 1961 - 1993



GROUNDWATER LEVEL FROM WHITE GATES COTTAGE
1990 - 1995 (SY 857 818)



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4. CATCHMENT USES

4.1. Water Abstraction and Supply

Here we consider the abstraction of water from the surface or below the ground for public water supply, industry and other uses.

4.1.1. Our Objective

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

4.1.2. The Role of the NRA

Our management of water resources is guided by European Union and UK legislation. We have duties and powers to :

- *ensure water is used properly, regulating abstractions using licences*
- *conserve water supplies and protect them from over use*

Our work involves a range of activities :

- *enforcing abstraction licence conditions to protect the water environment and the rights of other abstractors*
- *working on a system of mapping the availability of groundwater*
- *developing and implementing a consistent approach to determining licences*
- *working on ways of defining acceptable river flows to help us determine licences*
- *supporting selective domestic metering where resources are stressed*
- *defining groundwater protection zones and publishing groundwater vulnerability maps to protect resources from development and pollution risks*
- *trying to influence the business plans of water companies, promoting measures to alleviate the detrimental affect of their abstractions, and improving flows in affected rivers.*

4.1.3. Local Perspective

Nearly 90% of licensed abstraction in the catchment is derived from groundwater, and the chalk aquifer is the dominant source of supply.

There are a total of 64 licences in the catchment with a licensed daily quantity of 19.42Ml and an annual quantity of 3007.25Ml. Licensed daily quantity represents how much could legally be abstracted each day and where no specific daily quantity is available, the average of the weekly licensed value is used. The way that annual quantities are calculated means that the licensed daily quantity cannot be taken every day of the year.

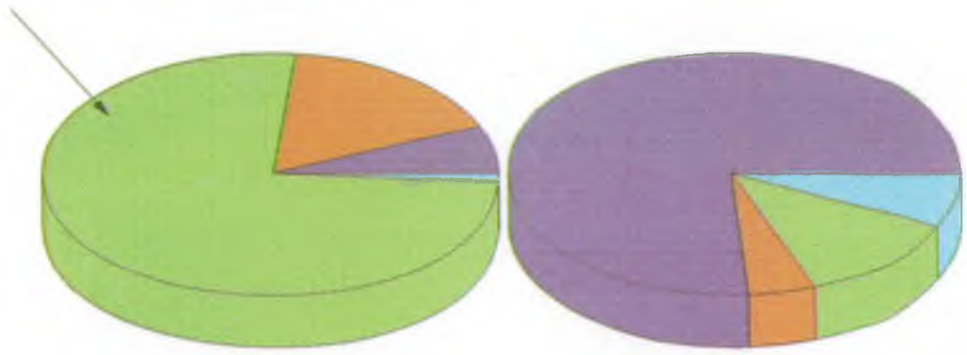
Figure 2 shows the breakdown of groundwater and surface water use in the catchment. The largest groundwater use (by licensed volume) is public water supply (PWS), although general farming has the largest number of licences. The largest licensed surface water use is for leisure and commercial purposes, although the actual numbers of licences are evenly spread between uses.

Licensed abstractions fall into two basic categories, consumptive and non-consumptive use. Consumptive use generally involves the loss of a proportion of the water abstracted e.g. PWS. Non-consumptive use returns virtually all the abstracted water back into the catchment close to the point of abstraction e.g. fish farms. Consumptive uses may have more impact on rivers than non-consumptive uses, though these can still have localised impacts depending on the rates of

FIGURE 2 : POOLE HARBOUR & PURBECK CATCHMENT - LICENSED ABSTRACTIONS

Groundwater

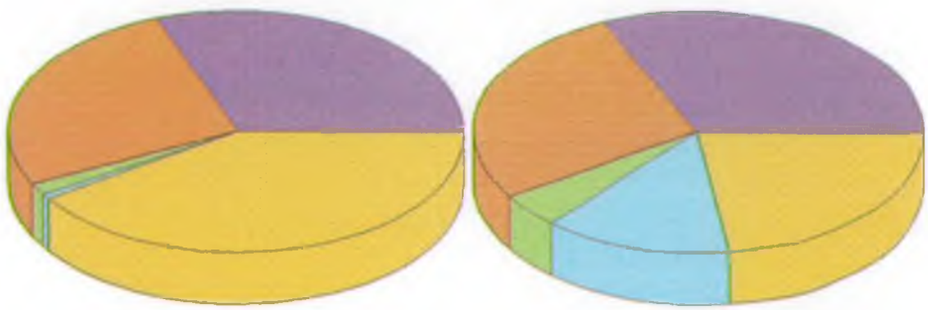
NOTE: WWS Lulworth Springs licence allows for 1MLd of the licensed 6MLd to be used for stream support, the yearly licensed quantity is combined. For clarity the abstraction is shown all as public supply.



% Of Abstractions **Number Of Licences**

%'s based on yearly licensed quantities
See text regarding public supply quantities

Surface Water



% Of Abstractions **Number Of Licences**

%'s based on yearly licensed quantities
Other - Leisure and Commercial
Spray Irrigation - Agriculture and Leisure

abstraction and local conditions. The majority of abstraction within the catchment is consumptive.

The table below indicates the actual use of water compared to licensed quantities for the catchment for the period 1993-94. It is based on returns made to the NRA, a condition on most abstraction licences (not all the licences within the catchment are included).

Source	No Of Licences Data Based On	Licensed Quantity (Ml)	Actual Quantity (Ml)	% Use
Groundwater	13	1615.14	605.64	37.50
Surface Water	7	193.41	30.24	15.64
Total	20	1808.55	635.88	53.14

Public Water Supply

Wessex Water Services (WWS) are the sole suppliers of mains drinking water in the catchment, with the main demand at Poole and Swanage. At the local level, Poole is supplied with water imported from the companies groundwater sources in the Piddle catchment, and from boreholes at Sturminster Marshall in the Stour catchment. Swanage is served by local groundwater sources at Ulwell.

WWS have five licensed abstractions in the catchment (see Map 5). The sources, licensed quantities and conditions are identified in the table below.

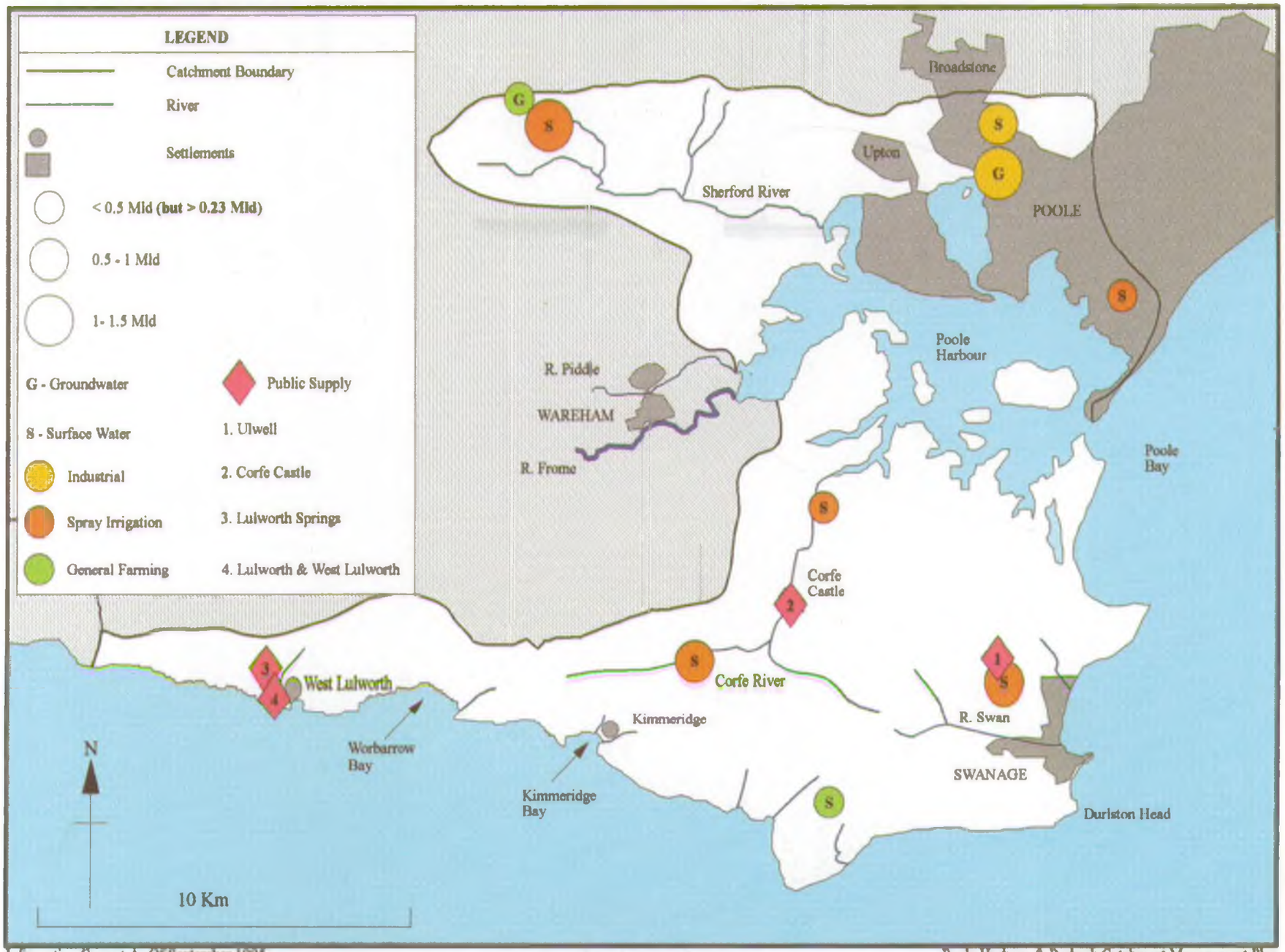
Source	Yearly Licensed Quantity (Ml)	Daily Licensed Quantity (Ml)	Comments
Ulwell	340.95	3.270	
Lulworth	272.76	0.909	These licences are conjunctive, that is the total allowed is the larger of the two sources, not the sum of them
West Lulworth	45.46	0.636	
Lulworth Springs	1000.00	6.000	This source is not currently in use, but the licence is conjunctive with the two above, and includes 1Ml/d for stream support when operational
Corfe Castle	681.90	3.000	

Transfers and Conjunctive Use Schemes

WWS have been investigating options for developing alternative sources to enable them to reduce abstraction from their Briantspuddle source in the neighbouring Piddle catchment. The aim is to replace half the current Briantspuddle abstraction; 9Mld is being sought, and studies are focusing on boreholes at Bulbury and Lytchett Minster in the Sherford catchment, as these may have the potential to intercept groundwater at depth in the underlying chalk aquifer which currently drains to offshore springs in Poole Bay.

Where necessary, WWS have the ability to augment supplies to Poole from their Blashford sources which lie to the east of Bournemouth and are likely to make use of their Lulworth Springs licence to help meet demands in neighbouring areas outside the catchment. This is likely to include Wareham and Winfrith.

MAP 5 : POOLE HARBOUR & PURBECK CATCHMENT - SIGNIFICANT LICENSED ABSTRACTIONS



Information Correct As Of September 1995

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Public Water Supply and Water Conservation

The groundwater sources in this catchment are rarely affected by drought. However, should it become necessary, WWS can take action to limit demand. This area is not currently under sufficient resources stress to necessitate selective metering, though WWS routinely install meters in new properties.

The NRA is currently seeking information from WWS on their leakage and pressure control strategy for the strategic supply zone within which this catchment is located.

Future Demand and Public Water Supply Options in the Catchment

The licensed source at Lulworth, which is currently not developed, is likely to be used to meet future demands. The scheme incorporates stream flow support arrangements. This means that there will be an element of environmental gain when abstraction eventually takes place under this new licence. The timescale for this depends upon the growth rate of PWS demand over the next decade.

Private Water Supply Resources

The table below summarises other uses.

Use	% Of Total Annual Licensed Quantity		Predicted Annual Growth Rate	Comments
	Ground	Surface		
Non-mains domestic supply (many are exempt from licensing by being less than 20m3/d for private domestic household use)	1.02	0.75		In areas with low population density there may be difficulties in supplying mains water at reasonable cost. In these circumstances ground or surface water supplies provide a useful alternative, yields permitting.
Agriculture (some are exempt from licensing control being from surface water and less than 20m3/d)	6.50	30.72		The South Western Region Water Resources Strategy predicts little growth in this use.
Spray irrigation (agriculture, horticulture & leisure, such as golf courses)		26.55	1.7% (1995 - 2001) 1% (2002 - 2021)	Demand generally occurs at times of year when rivers are naturally low and impacts can be high. We will generally expect any such schemes to include the provision of storage to protect the water environment. Growth rates taken from South Western Regions Water Resource Strategy.
Industrial	16.87	1.51	0.75% (to 2021)	Growth rates taken from South Western Region Water Resource Strategy.
Other (commercial, public services & leisure)		40.47		This use includes off-stream amenity ponds

4.2. Effluent Discharges

Here we consider the discharge of effluent directly to rivers, estuaries, the sea or into the ground. Effluent includes sewage, industrial and farm wastes. We regulate the disposal of effluent by issuing consents to control discharges, and by taking action if there is accidental pollution.

Natural waters can render the main constituents of many effluents harmless by natural processes providing that the effluent discharge is properly controlled.

4.2.1. Our Objective

To protect the water environment from harm caused by the disposal of effluent, and allow the widest possible use to be made of natural waters.

It is illegal to discharge sewage effluent or trade waste without our consent. We consider applications for consent to discharge on a case-by-case basis, and can refuse to consent a discharge if it will cause an unacceptable deterioration in water quality.

4.2.2. The Role of the NRA

We have duties and powers to :

- *authorise discharges through a system of consents*
- *monitor discharges to see if they comply with standards. We may prosecute dischargers if they exceed their consent conditions*
- *monitor the impact of discharges on the receiving waters*
- *prevent illegal discharges*
- *influence investment in sewerage and sewage treatment by the water companies in line with AMP2 guidelines*

Our work involves :

- *working with planning authorities to control development where the sewers or sewage works are overloaded*
- *liaising with private owners, trade dischargers, farmers and WWS, carrying out regular site inspections and monitoring discharge quality*
- *constantly reviewing and developing our approach to water sampling and monitoring*

4.2.3. Improvements to WWS Discharges

Improvements to WWS discharges over the next ten to fifteen years are subject to available funding approved by OFWAT, the water industry's economic regulator. A strategic business plan, (Asset Management Plan AMP2), for these schemes was developed based on guidelines agreed between the NRA, Department of the Environment (DoE), Water Services Companies and OFWAT. The plan was submitted to OFWAT early in 1994.

In order of priority, schemes included are :

- *those required to meet and maintain current EC and domestic statutory obligations*
- *those required to meet and maintain new EC and domestic statutory obligations*
- *those which already have been separately justified to maintain river quality relative to the 1990 survey or to achieve river or marine improvements*

OFWAT declared the associated customer charging base in July 1994. The NRA has agreed improvement plans for the schemes shown over.

Scheme	Treatment Level	Investment Driver	Statutory Completion Date
Swanage Combined Sewage Overflows (CSO)	Improve 16 CSOs	EC Bathing Water Directive	1997
Swanage Outfall	Primary treatment Possible outfall relocation	EC Urban Waste Water Treatment Directive (UWWTD)	2000 2005
Lulworth Outfall	Fine Screening Possible outfall relocation	EC UWWTD (Appropriate Treatment)	2005
Poole Sewage Treatment Works (STW)	See text Section 4.2.4	Completion of scheme underway during AMP1	Summer 1996
Wareham STW	Improved treatment	UWWTD Maintenance of load	2005

4.2.4. Continuous Discharges

There are 21 sewage treatment works (STWs) with dry weather flows (DWFs) greater than 5m3/day discharging to rivers and coastal waters in the catchment (see Map 6). Eleven are operated by WWS, the majority of which receive domestic effluent, and discharge consent conditions are mainly aimed at controlling the loads of biochemical oxygen demand (BOD), suspended solids and ammonia.

Poole STW is currently undergoing a series of major improvements. Phase 1 and 2 are designed to reduce the volume and frequency of storm sewage discharges and we have recently issued an interim discharge consent that reflects these improvements. This STW also receives a significant component of trade effluent and the interim consent also contains conditions to control the discharge of specific metals and a range of List 1 organic substances. WWS have appealed against the organic chemical limits.

Phase 3 of the proposed improvements involves the construction of a biological aerated filter unit which will result in a major improvement in the quality of treated sewage effluent discharged. The scheme is due for completion by summer 1996 and it is expected that the improvements will result in a major reduction in the impact of the works on Holes Bay and Poole Harbour.

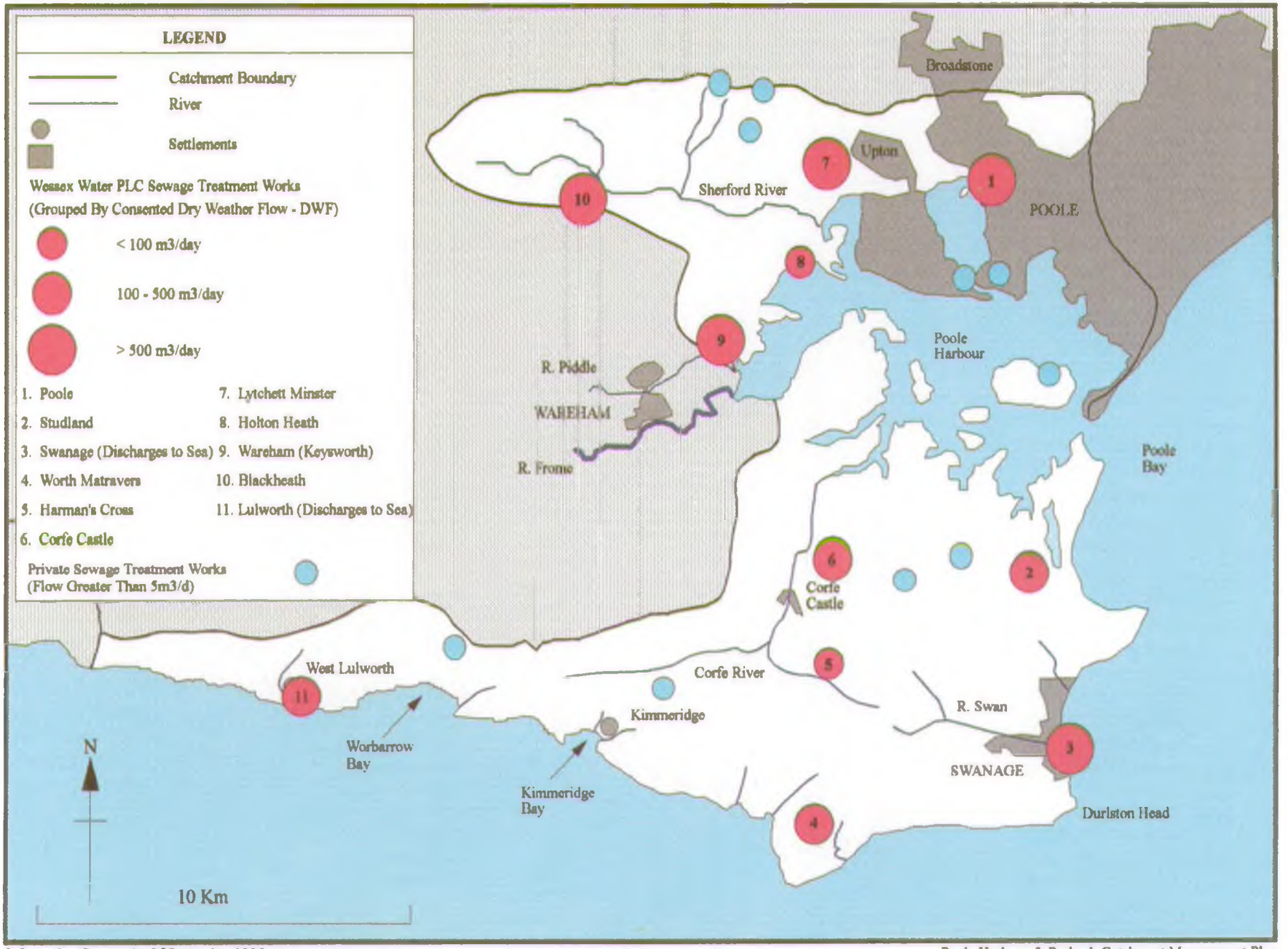
Holton Heath STW receives a trade effluent component from the Holton Heath Industrial Estate and discharges into a small stream that flows into Poole Harbour. Wareham STW, which discharges to the tidal section of the Piddle, also treats a small component of trade effluent.

Lytchett Minster STW and Studland STW discharge into Poole Harbour. Blackheath STW treats sewage for Bere Regis and surrounding villages and discharges to the Sherford. At Lulworth, screened sewage discharges to sea via an outfall at Lulworth Cove.

Swanage is served by a combined surface water and foul water sewerage system that discharges through an outfall at Peverill Point. The sewage is macerated before discharge but receives no further treatment. The relocation of this outfall is subject to the outcome of comprehensive studies (see Section 5.1.5). The combined sewerage system also incorporates a number of sewer overflows which frequently discharge into the Swan and directly to the sea. Proposed improvements at Swanage are outlined in Sections 4.2.3 and 5.1.2.

There is a discharge from the Merck site at West Quay Road to Holes Bay that is authorised by Her Majesty's Inspectorate of Pollution (HMIP) under Integrated Pollution Control (IPC) Regulations and which meets our requirements.

MAP 6 : POOLE HARBOUR & PURBECK CATCHMENT - EFFLUENT DISPOSAL



Information Correct As Of September 1995

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BP operate the oilfield at Wytch Farm. The gathering station used to discharge treated water into Wych Lake with an HMIP authorisation. This discharge has now ceased and the treated water is now injected into oil bearing strata. Other well sites operated by BP have consents to discharge clean surface water from bunded areas within their site.

The United Kingdom Atomic Energy Authority (UKAEA) Winfrith site has a sea outfall which discharges at Arish Mell

4.2.5. Pollution Incidents

During 1994 there were 65 substantiated pollution incidents in the Poole Harbour & Purbeck Catchment. The most common cause of reported incidents was road traffic accidents involving spillage of diesel and petrol. Minor pollution incidents commonly involve discharges of oil, paint, dyes, vehicle washings and suspended solids from industrial premises to surface water drainage systems and watercourses.

In Poole there are oil storage facilities, chemical works, plating factories and other commercial activities which represent a pollution risk to small watercourses and Poole Harbour.

In recent years more serious incidents include the spillage of 20,000 litres of light fuel oil to Poole Harbour during a ship to shore transfer operation, and a discharge of wood preservative to a small stream at Holton Heath from the nearby industrial estate. These incidents were investigated and the polluters subsequently prosecuted.

The NRA investigates all reported pollution incidents and, where appropriate, collects the necessary evidence to support prosecution. Post-investigation work includes follow up visits to ensure that the necessary remedial actions are taken to mitigate the effect of any pollution, and that the necessary pollution prevention measures are taken.

Historically, pollution has occurred in Holes Bay by consented and unconsented discharges of heavy metals. While intensive efforts by water quality staff have reduced metal inputs to an acceptable level, the metals persist in estuarine and marine sediments in the Bay.

Prevention is better than cure, and we commit substantial resources to site visits to advise local business and farmers on the best ways to avoid pollution.

4.3. Farming

Over 80% of the land in England and Wales is farmland, and the way this land is used affects the quality of our water environment. We are concerned about the pollution of surface and groundwater from animal wastes, fertilisers and pesticides. Soil erosion, land drainage and stock damage to river banks can also lead to problems. A sustainable farming system that conserves the soil, and minimises and recycles wastes will reduce the risk of damage to the water environment.

4.3.1. Our Objectives

To protect the water environment from potentially damaging farming activities and to encourage agricultural practices that improve the water environment.

4.3.2. The Role of the NRA

We control and prevent pollution in the same way that we do with any other industry, but there is only a limited range of things we can do to influence the way that farmers use land. Other agencies such as MAFF can encourage sensitive farming practices using financial incentives.

We have duties and powers to :

- *prevent and control pollution*
- *deal with pollution incidents*
- *issue consents to discharge from farms. However we encourage farmers to dispose of farm wastes to land rather than discharging treated wastes directly to rivers*
- *regulate the abstraction of water for use on farms*
- *supervise matters relating to flood defence*

Our work involves a range of activities :

- *assessing the impact of farming on water quality, prioritising our work where there are gaps in our knowledge*
- *promoting the designation of water protection zones (for example Nitrate Sensitive Areas) and stopping certain activities within them*
- *targeting our pollution prevention work where it is needed most*
- *inspecting farms so that pollution can be prevented*
- *developing best practices to prevent pollution from the storage and disposal of farm wastes, and from the management of farmland. This may include things like buffer zones or other schemes to prevent pollution and improve rivers and wetlands for wildlife*
- *developing a public relations plan to educate farmers and improve public awareness of pollution caused by farming*
- *working with other agencies such as MAFF to make the most of our pollution prevention work*
- *controlling certain works which may affect rivers*
- *maintaining the river system to provide flood defence for agricultural land*
- *developing Water Level Management Plans for environmentally important sites on main river*
- *providing flood warnings to mitigate damage to property and risks to stock*
- *promoting the Code of Good Agricultural Practice for the Protection of Soil*

4.3.3. Local Perspective

Farming has shaped the appearance of the Isle of Purbeck over the centuries and is an important economic activity in the catchment. The table below identifies current land use and the change in stock numbers over the 1979-93 period. Broad changes include a reduction in the numbers of dairy units and an increase in sheep farming in the catchment.

1993 Land Uses	hectare	%	Change in Use 1979-93	hectare/units	%
Total agricultural land (% catchment area)	9212	42	Change in cattle/calves	-2286	-18
Grassland (% total agricultural land)	6800	74	Change in dairy units	-14	-26
Arable (crops & fallow)	1858	20	Change in sheep	7176	81
Set Aside	260	3	Change in pigs	-229	-6
Farm Woodland	96	1	Change in fowl	-8003	-14
			Change in cereal (ha)	-787	-40

This information was taken from census statistics provided by MAFF Land Planning Unit. The data are derived from parishes and do not correspond exactly to catchment boundaries.

4.3.4. Pollution Risk

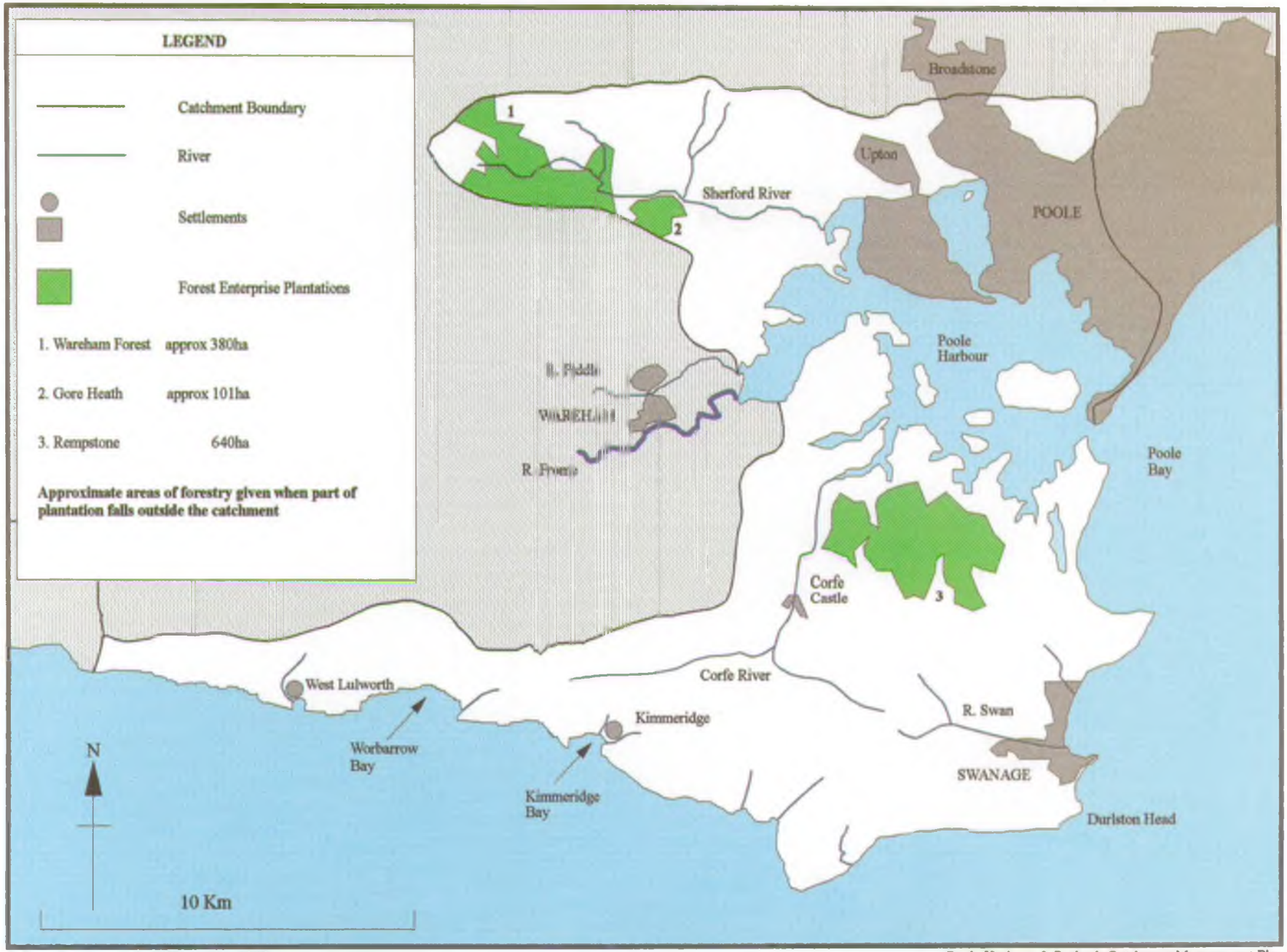
There has been considerable investment in farm waste storage facilities in recent years and this has resulted in a reduction in the number of incidents of farm pollution.

There were 10 substantiated farm pollution incidents in the catchment between 1992-94. These mainly originated from dairy farms and most incidents were minor in nature, involving slurry from agricultural yards.

The Code of Good Agricultural Practice for the Protection of Water provides farmers with advice on how to avoid pollution. The disposal of slurry and sewage sludge should comply with the code. The code also provides farmers with advice on the safe application and disposal of pesticides, herbicides and sheep dips.

We are working with farmers throughout the catchment, advising them of their responsibilities and ensuring that the risk of pollution from all agricultural activities is minimised. We encourage the active use of Farm Waste Management Plans; this task has been made more difficult since the removal of Grant Aid.

MAP 7 : POOLE HARBOUR & PURBECK CATCHMENT - FORESTRY



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4.4. Forestry

Well managed forestry in the right places does not harm the water environment and will often bring benefits. However, in some circumstances, woodland planting and management can cause problems. Acidification, soil erosion, pollution, water yield, increased flood risk and damage to wildlife habitats concern us in some parts of England and Wales, but in the South Western Region the planting and management of new woodland does not usually cause problems for the water environment.

The Forestry Authority regulates forestry in the UK by licensing some operations using felling licences and providing grant aid through the Woodland Grant scheme. The Forestry Authority has published a series of guidelines on forests and : water, nature conservation, landscape design, archaeology and recreation. The Guidelines encourage environmentally sympathetic planting, management and harvesting. The Farm Woodland Premium Scheme operated by MAFF also provides grant aid for new woodlands on farms.

4.4.1. Our Objectives

To protect the water environment from the negative effects of forestry activities and to encourage forestry practices that improve the water environment.

4.4.2. The Role of the NRA

We have duties and powers to :

- *regulate some forestry works using land drainage legislation*
- *deal with pollution incidents*

Our work involves :

- *working with the Forestry Authority and local authorities to ensure that the most significant forestry schemes consider effects on the water environment. We welcome the opportunity to comment on these schemes and on Indicative Forestry Strategies where they are being developed*
- *identifying areas that might be sensitive to the planting of forests to the Forestry Authority, Forest Enterprise and local authorities*
- *consenting significant planting within the main river floodplain under land drainage byelaws. With the Forestry Authority we are looking at the prospects for new floodplain woodlands in the lowlands of England and Wales, and considering their potential impact on flood storage*
- *promoting the Forest and Water Guidelines and developing best practice techniques through our R&D programme*
- *working with the Forestry Authority to improve the way we consider the environmental impact of proposed forestry schemes. At the moment, only new planting schemes require an Environmental Impact Assessment but large-scale woodland management activities can cause as much damage to the water environment as can new planting schemes*

4.4.3. Local Perspective

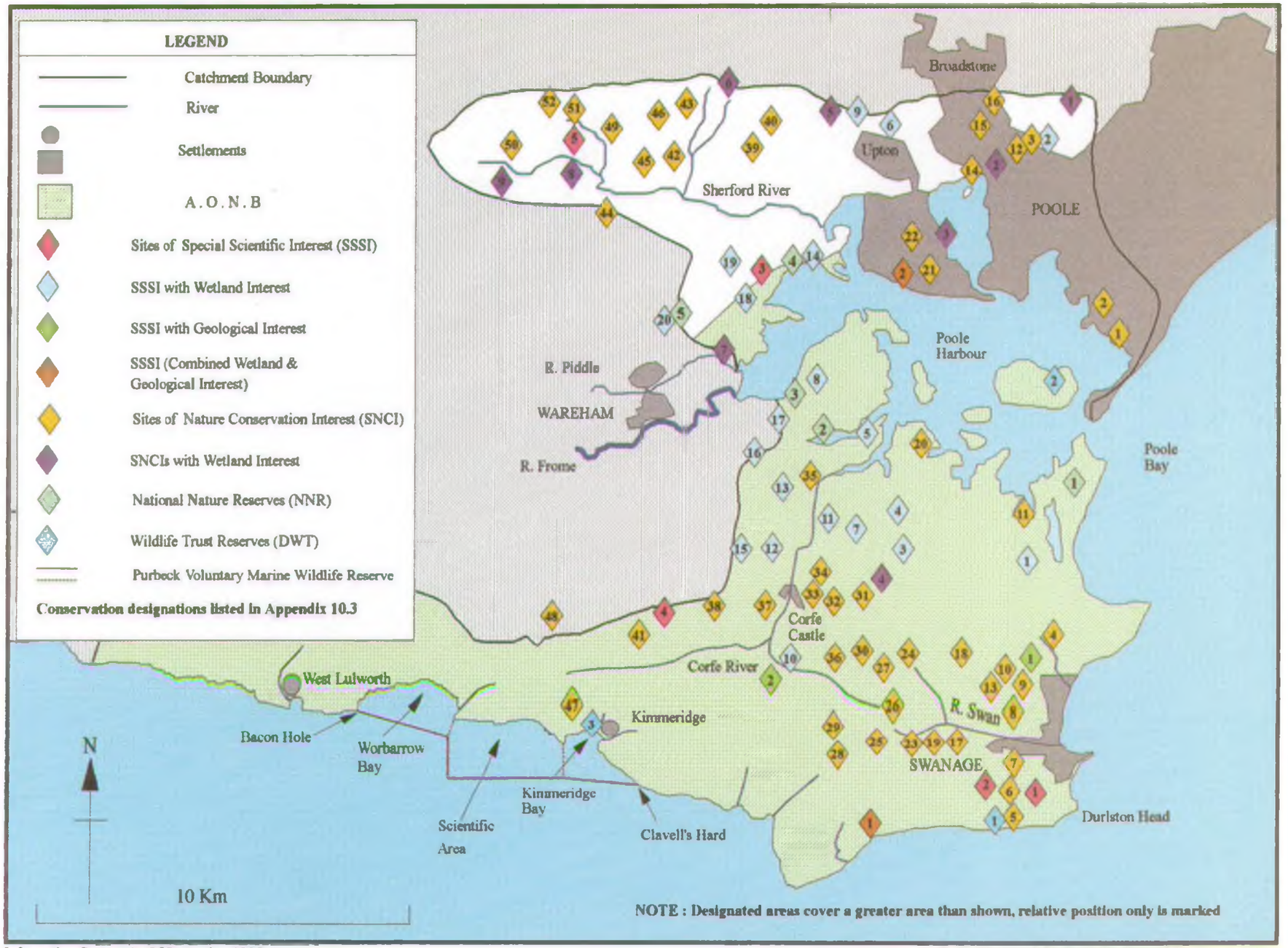
During 1992, the Forestry Commission was reorganised into two bodies, the Forestry Authority which has a regulatory role over the whole industry, and Forest Enterprise which manages the Commission's forest estate.

CATCHMENT USES

There are approximately 1121ha of forest managed by Forest Enterprise within the catchment, and in excess of 500ha of private woodland. MAFF statistics indicate 96ha of farm woodland (1993).

There are no designated acid sensitive areas in the catchment. The Sherford drains Wareham Forest and Morden Park, and flows along the northern boundary of Gore Heath. Several small streams drain the forested areas to the south side of Poole Harbour; none of these streams is known to be affected by forestry activity. Brownsea, Furzey and Green Islands are partially forested.

MAP 8 : POOLE HARBOUR & PURBECK CATCHMENT - CONSERVATION



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4.5. Conservation - Landscape, Wildlife and Archaeology

Here we consider how we protect and manage the natural environment and the historic built environment associated with rivers and wetlands.

4.5.1. Our Objectives

To ensure that these features are not degraded through neglect, mismanagement, or insensitive development and, where we can, to take measures to enhance them.

4.5.2. The Role of the NRA

We promote the conservation of landscape, wildlife and archaeology through our work to safeguard water quality, manage water resources, and provide flood defence. An important part of our work is to influence land use planners and land managers to look after rivers and wetlands sensitively.

We have duties to :

- *conserve and enhance landscape, wildlife and natural features, especially in rivers and wetlands*
- *protect and conserve buildings, sites and objects of archaeological, architectural or historic interest*

Our work involves a range of activities :

- *studying river and wetland wildlife. We are developing better methods for doing this*
- *developing standard ways of reviewing the effects of our work on wildlife*
- *establishing a national database to store wildlife information*
- *improving the way we consider and carry out environmental assessments*
- *encouraging local planning authorities and developers to promote wildlife conservation on rivers and wetlands and we encourage the development of new river management techniques*

4.5.3. Local Perspective

The catchment is dominated by Poole Harbour and the Purbeck ridge. Dividing the two, on the low-lying undulating tertiary deposits, is a mix of wet grasslands, heathland, scrub, conifer plantations and deciduous woodland. These continue around the western side of the Harbour as far as the outskirts of Poole, only interrupted by the pastures of the lower Frome and Piddle valleys.

The landscape between Worbarrow Bay and Swanage is dominated by the Corfe and Swan valleys with a patchwork of fields and hedgerows. Adjacent to this is open farmland sloping steeply to the south and the sea. Chalk uplands dominate the extreme west of the catchment.

The Dorset County Landscape Assessment : Landscape Character (Countryside Commission, 1993) defined landscape character areas for the county. We outline below the areas relating to the catchment with brief details of some of their distinguishing features.

Area	Features
Purbeck Limestone Plateau	Virtually no trees, fields enclosed by stone walls.
West Purbeck Coast	Patchwork of irregular fields, separated by hedgerows, fragments of woodland.
Corfe Valley	Patchwork of pastures interspersed with small woodlands across the valley. Corfe Common, unimproved acidic grassland interspersed with patches of bramble, gorse and bracken.
Purbeck Chalk Ridge	Relatively flat ridge top, extensive area of unimproved semi-natural chalk grassland. North side densely wooded, south side small-scale patchwork of fields, more fragmented on steeper slopes. Small villages and farmsteads at foot of ridge.
Chalk Uplands	Large arable fields defined by a network of sparse narrow hedgerows. Small blocks of woodland (beech, ash and oak). Few settlements.
East Dorset Woods & Farmland	Irregular small-scale patchwork of pasture fields. Deciduous and coniferous woodlands on higher terrain. Numerous small villages, hamlets and farmsteads.
Heathland	Low, gently undulating terrain. Heather predominant, fragmented at margins; irregular patchy mosaic of pastures and woodland.

4.5.4. Designated Areas

The large number of designated sites of local, national and international importance indicates the significance of this catchment for landscape and wildlife.

There are 29 designated Sites of Special Scientific Interest (SSSIs), 22 with a wetland interest; 61 Sites of Nature Conservation (SNCIs), 9 with a wetland interest; 5 National Nature Reserves (NNRs) and 3 Dorset Wildlife Trust (DWT) reserves in the catchment. Arne is an RSPB reserve as well as an SSSI. There is one Voluntary Marine Nature Reserve at Kimmeridge, and three Sensitive Marine Areas (SMAs) identified by English Nature (EN) covering virtually the whole of the Dorset Coast. Details are given in Appendix 10.3.

The catchment includes two proposed Special Protection Areas (SPAs) under the EC Birds Directive; Poole Harbour and part of the Dorset Heathlands SPA. Poole Harbour is also a proposed RAMSAR site in recognition of its international wetland importance.

A number of proposed Special Areas of Conservation (SACs), designated under the EC Habitats Directive, fall wholly or partly within the catchment; Dorset Heaths, Studland Dunes, Isle of Portland to Studland Cliffs and St Aldhelm's Head to Durlston Head.

The South Devon and Dorset Coast is a proposed World Heritage Site for its geology and geomorphology; this has been designated by the World Heritage Convention which is supported by UNESCO.

The Purbeck Heritage Coast is a non-statutory designation covering most of the coastline within the catchment. It was designated by the Countryside Commission, and is managed in conjunction with Dorset County Council and Purbeck District Council to resolve conflicts between land-use interests and to decide on policy for future management.

There are a number of built conservation areas within the catchment, and some activities carried out or consented by the NRA could affect these areas. The Corfe, for example, plays a key part in the landscape of Corfe Castle, and Kimmeridge and West Lulworth are both dissected by small streams.

Durlston Country Park covers about 105ha of coastal grassland and cliffs near Swanage. It was established in 1973 and now has 300,000 visitors a year. The Coastwatch Scheme was launched in

1992 as an integral feature of the Park, and places particular emphasis on monitoring the status of the guillemot colony on the cliffs and the marine mammals, especially bottle-nosed dolphins. One possible outcome of these studies could be the designation of the offshore area as a Marine Research Area.

Dorset Coastlink is a voluntary initiative forming a network which gives a coordinated approach to the promotion and protection of Dorset's coastal waters and wildlife. Durlston Country Park, the Purbeck Marine Wildlife Reserve at Kimmeridge, and Lulworth Cove & Heritage Coast are participating centres in this catchment.

4.5.5. Rare Species

The catchment contains a wealth of important and extensive marine and wetland wildlife habitats, many of which are interlinked, for example, mudflats, saltmarsh, reedbeds, carr woodland and wet heathland. These habitats support many scarce and restricted species too numerous to list, but include many British Red Data Book or Dorset Scarce Species; some key species are given here.

Poole Harbour itself is internationally important for wintering shelduck *Tadorna tadorna* and black-tailed godwit *Limosa limosa* and nationally important for a further five species of wildfowl and five species of waders including gadwall *Anas strepera*, goldeneye *Bucephala clangula*, avocet *Recurvirostra avosetta*, grey plover *Pluvialis squatarola*, redshank *Tringa totanus* and curlew *Numenius arquata*.

Other coastal areas of particular importance are Studland Bay, Swanage Bay and Durlston Head; the last supports breeding guillemots *Uria aalge* and razorbills *Alca torda*, and nearby Dancing Ledge has breeding puffins *Fratercula arctica*.

Reedbed habitat is important for breeding bearded-tit *Panurus biarmicus* and Cetti's warbler *Cettia cetti*. Brownsea, Green and Furzey Islands support important populations of the red squirrel *Sciurus vulgaris*.

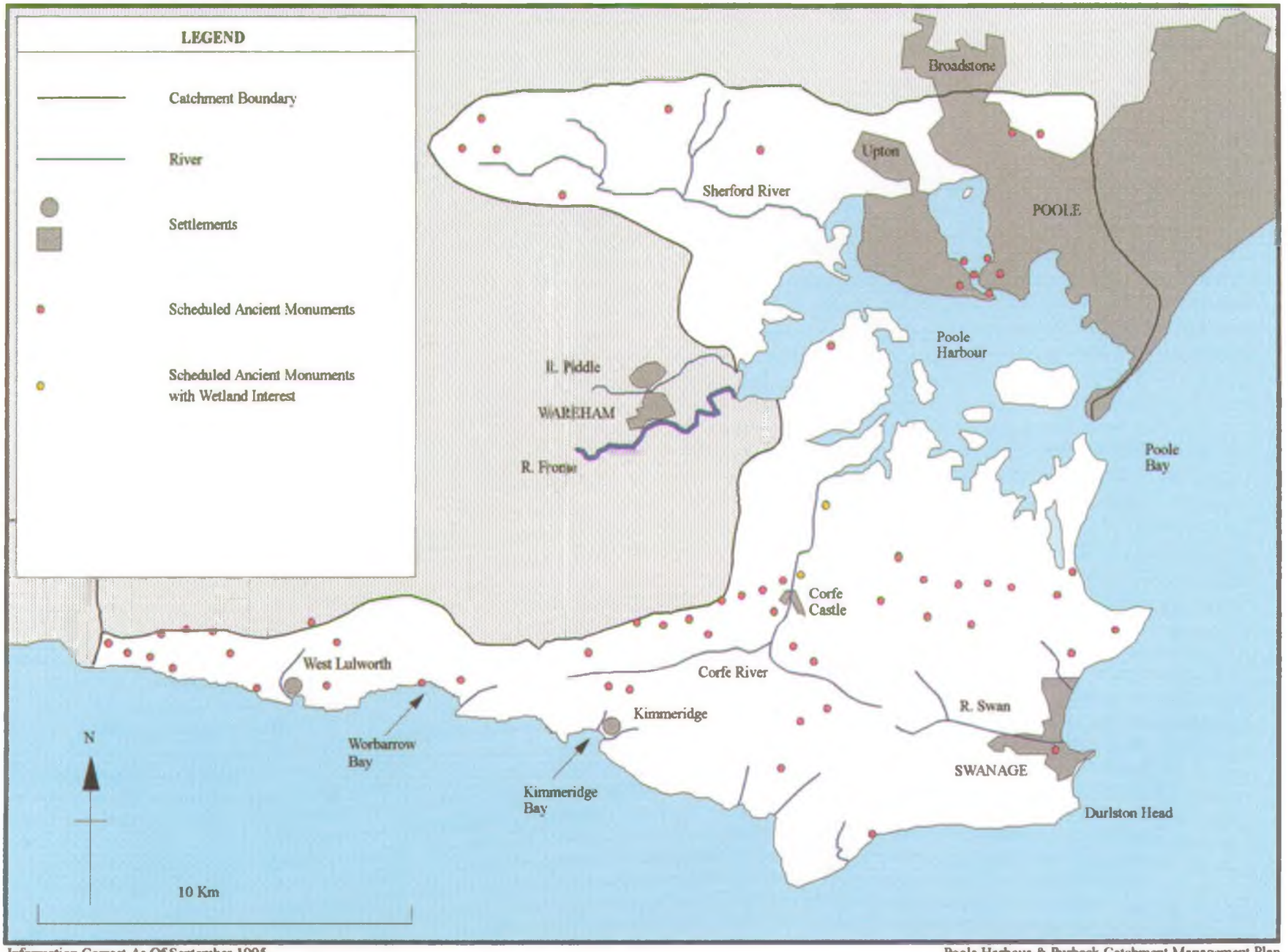
Inland wetland habitats support several rare plants and invertebrates including marsh gentian *Gentiana pneumonanthe*, bog sedge *Carex limosa*, brown beak sedge *Rhyncosphora fusca*, small red damselfly *Coenagrion tenellum*, scarce blue-tailed damselfly *Ishnura pumilio*, the diving beetle *Graptodytes flavipes* and the rove beetle *Paederus caligatus*; all of these species require standing water, peat bogs or marshland.

Two rare plant species, the wild cabbage *Brassica oleracea* and carrot broomrape *Orobanche maritima*, are found within the South Dorset Coast SSSI; seablite *Suaeda vera* occurs on the salt marshes around Poole Harbour. The endemic early gentian *Gentianella anglica* is still found associated with coastal chalk around Lulworth.

There are reports of otters *Lutra lutra* within the catchment area but recent NRA and national surveys have found no evidence of tracks or signs. Populations are probably at very low levels although neither habitat quality nor food appear to be limiting.

We have a byelaw which requires that fyke nets, which are commonly used to catch eels in the Harbour, are fitted with guards to prevent otters becoming trapped in them. We have given special attention to enforcing this over the last two years.

MAP 9 : POOLE HARBOUR & PURBECK CATCHMENT - SCHEDULED ANCIENT MONUMENTS



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4.5.6. Invasive Plants

There is currently insufficient data available on the locations and abundance of invasive plant species in the catchment. Our current policy regarding Japanese Knotweed, Giant Hogweed and Himalayan Balsam is to take measures to control them where work is being undertaken, and to offer advice on control methods; we produce a free leaflet on this subject.

4.5.7. Archaeology

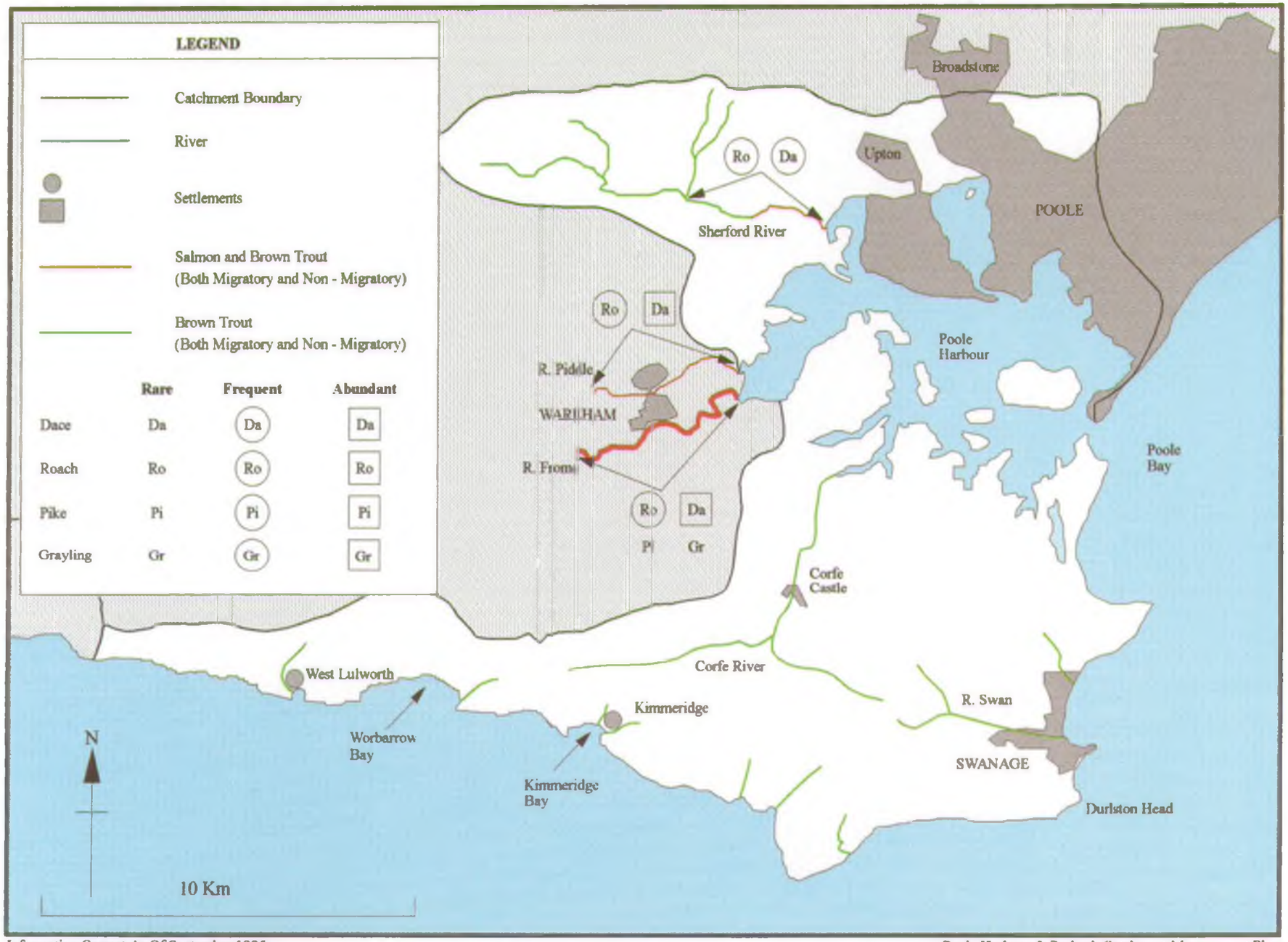
Most of the visible evidence of archaeology interest in the catchment is concentrated on higher ground, where relatively poor soils and low levels of cultivation have meant that major features have been retained relatively intact. Older examples include the Iron Age enclosures at Bindon Hill, the Iron Age fort at Flowers Barrow and the Rempstone stone circle. More recent features include the Norman Chapel on St Aldhelm's Head, the ruins of Corfe Castle, and the early 19th century Clavell's Tower folly at Kimmeridge.

There are 62 Scheduled Ancient Monuments in the catchment of which only two have wetland interest. Relatively little is known of the wetland archaeology of the area, along the coast and around and within Poole Harbour. It is likely that there are many more sites of interest in these areas, and waterlogging of artefacts generally assures a better degree of preservation than on a dry site.

There is evidence of prehistoric habitation on the heathland around the Harbour, revealed by excavations at Bestwall and Wytch Farm. Changing water levels may mean that some sites are now under water in the Harbour. An Iron Age dugout canoe has been recovered from the Harbour. By Roman times the catchment was extensively inhabited and there are numerous sites of interest including the bath suite at Bucknowle near Corfe Castle.

Poole was a significant medieval port, and numerous finds have been associated with the habourside including a limestone slab causeway and a reclaimed 15th century waterfront with shipbuilding artefacts. The wreck of a Spanish merchant vessel found in Studland Bay has been dated to around 1500.

MAP 10 : POOLE HARBOUR & PURBECK CATCHMENT - SALMON AND COARSE FISH DISTRIBUTION



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4.6. Fisheries

We consider here the conservation of wild populations of freshwater fish, and the maintenance and development of their environment. We also consider how we manage the exploitation of these stocks by angling and by other forms of fishing.

We only have limited responsibility for fisheries in Poole Harbour and the Purbeck coastal waters; Southern Sea Fisheries District Committee are the statutory Sea Fisheries Authority. The NRA regulate the fisheries in Poole Harbour for eels and migratory salmonids, and work with MAFF and Southern Sea Fisheries District Committee on issues which may affect these fisheries.

4.6.1. Our Objectives

To protect stocks of fish by maintaining water quality, water resources and other physical habitat features appropriate to the catchment, and protecting the passage of migratory fish.

4.6.2. The Role of the NRA

We maintain rivers so that they can sustain angling at an appropriate level, in balance with the needs of other catchment uses. We also ensure that neither angling nor commercial fishing takes place in a manner that could over-exploit fish stocks.

We have duties and powers to :

- *maintain, improve and develop the wild fish resource of the catchment*
- *ensure chemical water quality in those stretches designated under the EC Freshwater Fish Directive complies with standards. We also set river quality objectives to safeguard fisheries*
- *control the movement and introduction of fish into waters to protect the genetic integrity of indigenous stocks*
- *maintain, improve and develop fisheries, allowing for a sustainable harvest of fish by anglers and commercial fishermen where appropriate*
- *regulate angling and raise money for fisheries management by issuing rod licences for freshwater angling, and restricting fishing methods and seasons*
- *enforce regulations and byelaws to prevent illegal angling and fishing*
- *regulate commercial fishing by a system of licensing. This includes the control by limiting the numbers of licences issued, and, with the approval of the Minister, we may also make byelaws to regulate commercial fishing by restricting fishing methods and seasons*
- *ensure that water quality is suitable for shellfisheries where appropriate*

4.6.3. Fish Populations

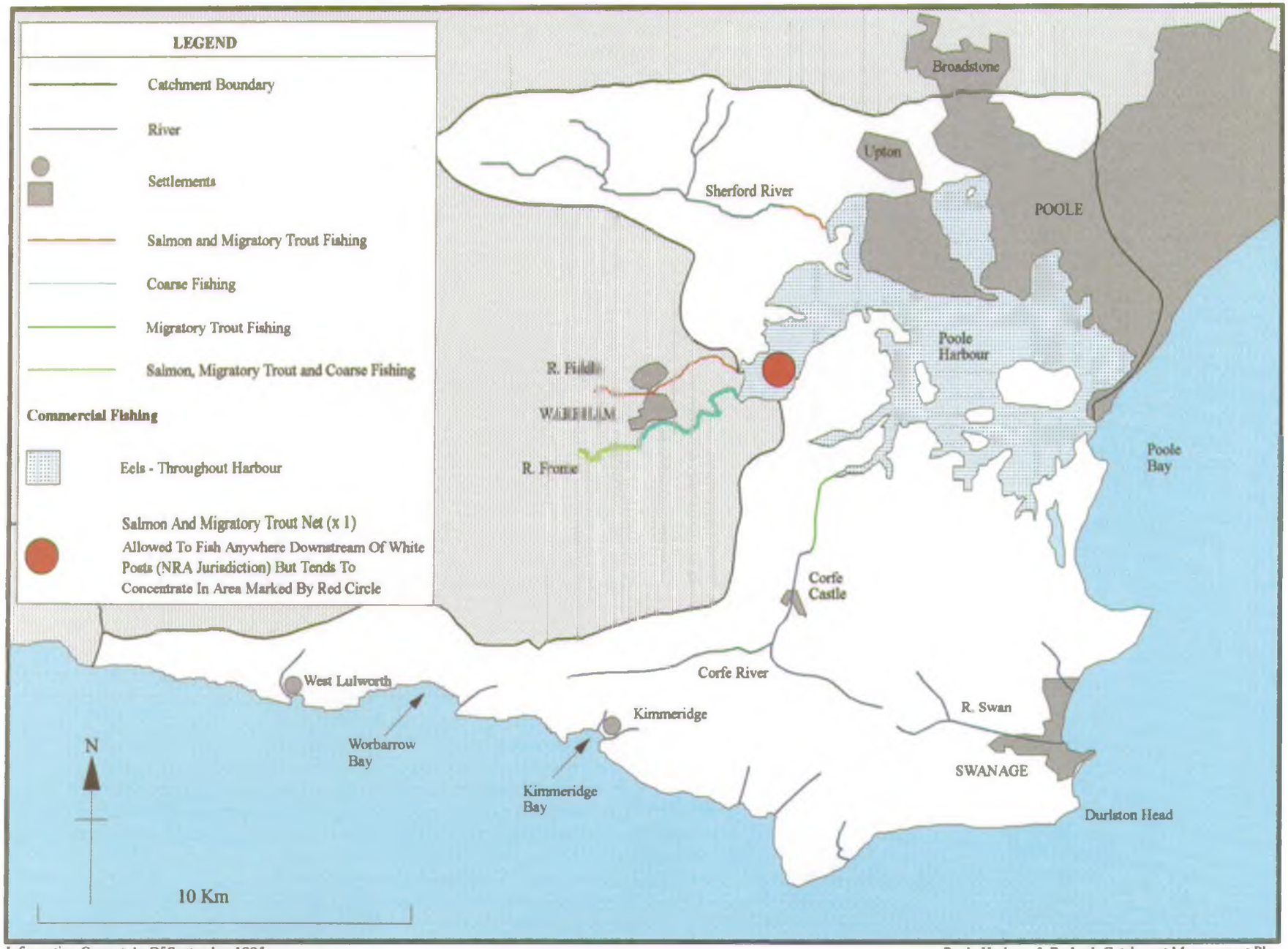
Fish populations are good indicators of the overall health of our rivers. We use special survey equipment and information from catch returns, counters and fish traps to assess the health of fish populations.

Salmon and Migratory and Non-Migratory Trout

Poole Harbour is on the migration route for salmon and sea trout for the Frome & Piddle Catchment. These stocks are reported in the Frome & Piddle CMP. Both species move through the Harbour all year round, with the peak run of fish being May to September.

Salmon have been recorded in the tidal reaches of the Sherford, although no juveniles have ever been found. It is likely that they are also occasional visitors to the tidal reaches of the Corfe.

MAP 11 : POOLE HARBOUR & PURBECK CATCHMENT - ANGLING AND COMMERCIAL FISHING



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Brown trout dominate the Swan, and there is believed to be a migratory component. The population of the non-tidal Corfe is composed entirely of brown trout with a large migratory component. Both migratory and non-migratory trout are present throughout the Sherford.

Other Species

Small populations of roach and dace exist on the Sherford; eels, bullhead and minnows are present in the Swan, Sherford and the Corfe; stoneloach are also present in the Corfe.

Poole Harbour contains a diverse population of marine fish species for which we have no statutory responsibilities. Mullet, bass and flounder are found in the tidal Sherford, mullet and flounder in the Corfe and all in the tidal reaches of the Frome and Piddle.

Anadromous twaite shad and smelt have been recorded in the Harbour.

4.6.4. Angling

All fishing in the catchment is privately owned, and controlled by local estate syndicates or clubs. There are small fisheries for migratory salmonids in the tidal parts of the Sherford and Corfe, but we believe that few fish are taken. There is no recognised fishing on the Swan.

We own a fishery in the tidal reaches of the Frome, and allow National Rod Licence holders to fish for coarse fish free of charge. We also own a fishery in the tidal reaches of the Piddle and let rods for salmon and sea trout angling on an annual basis. Coarse angling is allowed from November to March.

4.6.5. Commercial Fishing

We license one seine netsman for salmon and sea trout in Poole Harbour, in the Wareham Channel (Frome and Piddle joint estuary) immediately downstream of the NRA owned fishery (Map 11). We also license a number of eel fishermen in the Harbour, mostly using fyke nets.

There are shellfish fisheries in the Harbour, and small-scale facilities in Poole Park Lake. The Harbour supports an important commercial fishery for a variety of wild and farmed shellfish particularly the native and Pacific Oyster, clams, mussels and cockles. Edible crabs and prawns are also taken. Lug and ragworm are dug for bait, particularly on the mudflats of the southern shore.

4.7. Recreation and Amenity

Many people spend their spare time enjoying our rivers and coasts. Where we can, we try to improve facilities for these people but we must always safeguard the environment from any damage they might cause.

4.7.1. Our Objectives

To develop the amenity and recreational potential of inland and coastal waters and associated land.

4.7.2. The Role of the NRA

We have duties and powers to :

- *protect and maintain access to beautiful areas or special sites of interest*
- *make sure that land and water under our control is made available for recreation and at all times cater for the needs of the chronically sick or disabled*
- *make byelaws to regulate recreation*
- *make byelaws covering navigational matters where there is a public right of navigation and in the absence of a navigation authority*
- *charge for facilities that we provide for recreation*

We are involved in a range of activities :

- *working with other agencies such as planning authorities and sports associations to develop recreation facilities*
- *working with other organisations to develop plans and strategies for promoting recreation in the water environment*
- *providing information*
- *managing land which we own or lease with recreation in mind*

4.7.3. Local Perspective

As a particularly attractive area with a wealth of sites of ecological, archaeological and general landscape appeal, this catchment is very highly regarded and utilised as a recreational and educational resource. Dorset's rocks and landscape are studied by around 200,000 student visitors every year.

Open space adjacent to watercourses or water bodies in the urban areas of the catchment is a valuable resource. The presence of water is an attraction in itself and the linear nature of rivers means that they work admirably as *green corridors*.

Water-Based Recreation

Coastal waters and the Harbour are used intensively for a wide range of recreational pursuits including swimming, diving, angling, sailing, canoeing and pleasure boating

Poole Harbour Commissioners are the Statutory Harbour Authority for Poole Harbour, exercising control over navigation. The Poole Harbour Steering Group, which includes representatives from PHC and the NRA, have produced an Aquatic Management Plan which aims to promote the sustainable use of the Harbour, balancing the demands on its natural resources and resolving conflicts of interest by a variety of methods including zoning.

The Harbour is home to several marinas and boat havens, and numerous moorings. Boating is also a major activity on the tidal Frome, and this is covered in the Frome & Piddle CMP.

Passive recreation use is popular around Lulworth, Kimmeridge, Swanage (Durlston Head and Swanage Bay), Studland and Sandbanks (Poole). There are 12 major bathing beaches in the catchment which are heavily used during the summer months; 10 of these are designated as EC Bathing Beaches (see Section 5.1.2).

Land-Based Recreation

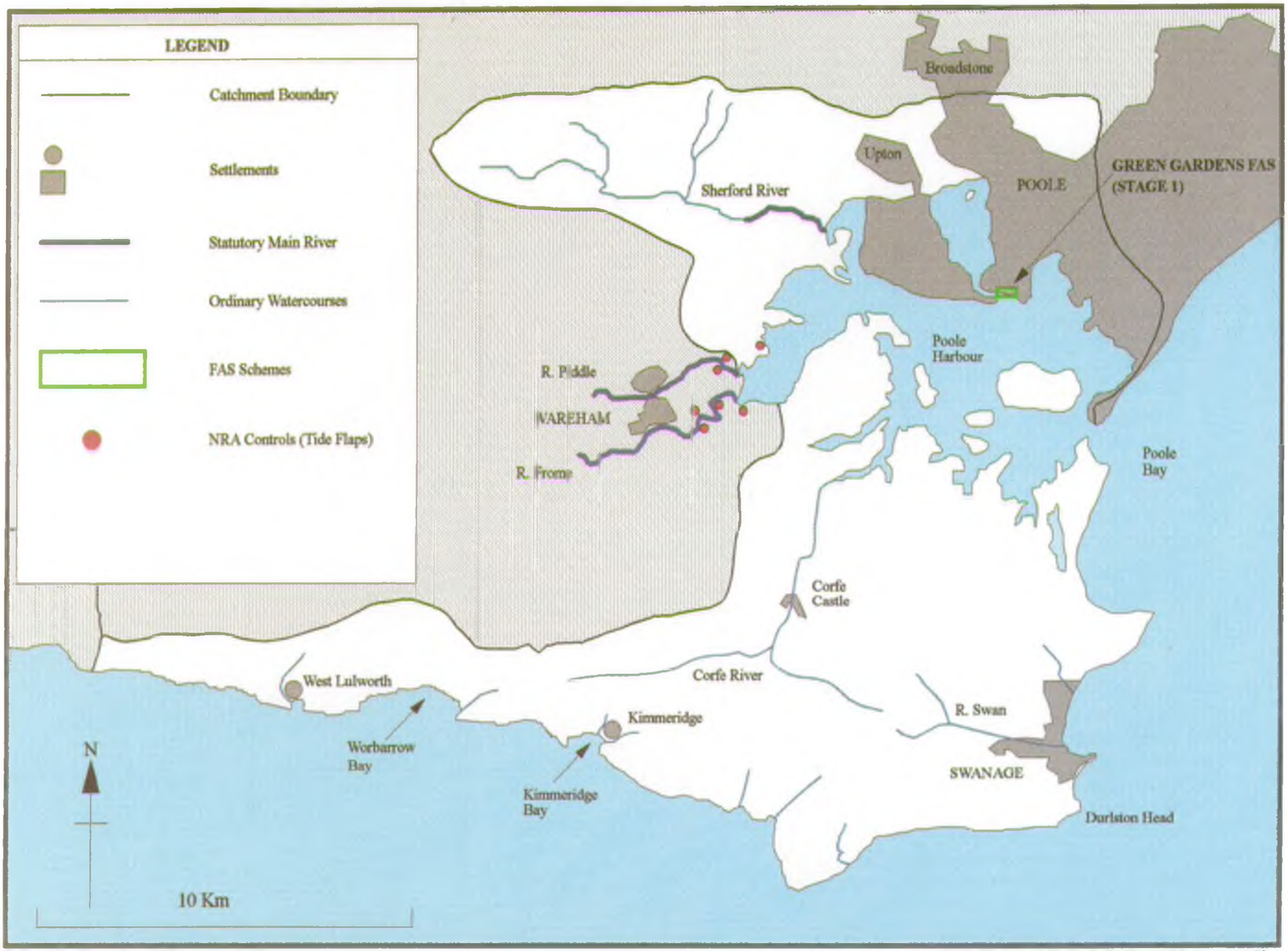
Many footpaths, bridleways and roads cross the catchment affording excellent views and enjoyment of the rivers, Harbour and coast. Several paths follow, cross or come close to the Sherford, Corfe and Swan. Access to streams which drain the coastal strip is possible in some locations by rights of way.

The Coast Path is popular with both long distance and casual walkers; heavy use in some areas has caused erosion and disturbance to wildlife. Some of the path passes through MoD ranges, and access can be restricted at times.

Horse riding, mountain-bike riding, birdwatching and climbing have all grown in popularity in recent years and take place wherever there is suitable public access.

There are a number of sites where recreation, education and conservation facilities have been specially provided. These include the DCC Country Park at Durlston, the RSPB Reserve at Arne, the National Trust properties of Brownsea Island and Studland, and Poole BC's Upton Country Park. Typically, these sites have nature trails, bird hides and exhibitions; some are accessible to the disabled. Other educational facilities exist at Lulworth, Kimmeridge (including a diver's underwater nature trail) and the Holton Lee Environmental Study Centre at Lytchett Matravers, which is designed for disabled users.

MAP 12 : POOLE HARBOUR & PURBECK CATCHMENT - CONTROL STRUCTURES AND STATUTORY MAIN RIVER



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4.8. Flood Defence and Land Drainage

River flows vary widely and are affected by the weather, geology and land use. . We manage flood risk from rivers and the sea using Flood Defence and Land Drainage powers.

Flood risk and land drainage have always affected the way we use land. By improving our control of water, we have been better able to make use of river and coastal floodplain for farming or building towns. This control can take many forms, from simple channel alterations to major floodbanks and artificial washlands. Works constructed for other purposes, such as weirs, mills and bridges, have also altered the natural river system.

Better protection from floods and better land drainage have improved our quality of life. However, unless properly managed, these benefits may result in other problems such as increased downstream flows and a legacy of expensive works for future generations to maintain. Changes in land use, made possible through drainage and flood defence, may also cause significant environmental damage, particularly to wetlands.

Today we manage flood defences and land drainage to balance the needs of all uses with the needs of the environment.

4.8.1. Our Objectives

To provide effective defence for people and property against flooding from rivers and the sea, and to provide adequate arrangements for flood forecasting and warning.

4.8.2. The Role of the NRA

Legislation tells us what we can and cannot do, and our statutory Flood Defence Committees make decisions on flood defence matters. All rivers are classified as either main rivers or ordinary watercourses on statutory main river maps. We supervise all flood defence matters, but have special powers to carry out or control work on main rivers. Local authorities are responsible for flood defence on ordinary watercourses.

Sea defences are constructed to prevent the flooding of land by the sea. We have responsibility for carrying out sea defence works except where defences are privately or local authority owned. Local authorities are responsible for protecting the coast from erosion by the sea.

It is recognised that sea defence and coast protection cannot be in isolation of one another, as each has an effect on the other; hence the recent move to Shoreline Management Plans, now being produced by responsible bodies for defined coastal cells.

We have duties and powers to :

- *control certain works and advise planning authorities on flood defence*
- *maintain and improve those parts of the flood defence system which are under our control*
- *provide flood forecasts and warnings so that risk to life and damage to property is reduced during floods*

We are involved in a range of activities :

- *working closely with other agencies including MAFF, local authorities, conservation and recreation bodies*
- *surveying assets and flood risk areas to improve our management of flood defence*
- *working on a Flood Defence Management Framework and related systems to ensure that flood defence assets are managed properly*
- *setting and monitoring specific targets to improve our performance*
- *supporting R&D and developing best practices for our work*

4.8.3. Local Perspective

There is only 3.10km of main river in the catchment, which is on the lower Sherford. Adjacent land use is predominantly agricultural although the A351 crosses the Sherford and the A35 runs close by. Where rivers drain into the Harbour, the tide will influence their levels; double high tides extend the period of raised water level.

Tidal river defences, consisting mainly of clay earth embankments and associated drainage, exist along the banks of the Frome and Piddle and extend upstream as far as Wareham.

Purbeck District Council are currently constructing a Flood Alleviation Scheme (FAS) on the Swan, to protect Swanage from flooding (see Section 7.3.2).

There is a tidal defence at Green Gardens, Poole which was constructed by Poole Borough Council but is now maintained and operated by the NRA. This tidal defence needs to be extended westwards to Poole Quay which is vulnerable to flooding (see Section 7.3.1).

Maintenance

This work consists mainly of the maintenance of our control structures and defences, management of cut weed, and general maintenance of the river corridor.

Emergency Response

During floods our workforce removes blockages and operates flood hatches. We concentrate on the tidal reaches of the Frome and to a lesser extent on the Piddle. Occasionally we have to take emergency action to protect the tidal embankments from breaching.

Our priorities are to :

- *ensure that FASs, both river and coastal, operate to their design standard*
- *manage high flows on the main river within the catchment*
- *respond to flood situations on ordinary watercourses, where resources allow, in support of local authorities*

4.9. The Built Environment and Development Plans

Here we consider the built environment, and the process of planning and regulating the construction of new development including roads, housing and industry.

County and District Planning Authorities plan and control development; although they must consult the NRA they do not have to follow our advice.

4.9.1. Our Objectives

To protect the water environment from the harmful effects of development and to minimise flood risk.

4.9.2. The Role of the NRA

There are two main ways we can influence development :

- *through the planning system we can assist local planning authorities to allocate land for development by commenting on local plans, identifying constraints and highlighting where the river environment can be enhanced by sympathetic development. We will continue to advise on water-related issues in our comments on structure and district wide local plans*
- *we can advise planning authorities on the control of development by offering formal and informal comments to planning authorities on planning applications and development guides. We can also control some developments using our own powers e.g. Land Drainage Consents*

We are also active at a higher level informing strategic planners of our environmental concerns e.g. rivers affected by over abstraction or water supplies threatened by major pollution hazards.

Local authorities prepare statutory development plans. In January 1994 we published a series of guidance notes for local planning authorities on methods of protecting the water environment through development plans. These notes highlight topics that concern us and offer guidance on model policies.

4.9.3. Planning and Flood Risk

The Government view is that development should be guided away from areas that may be affected by flooding, and should be restricted where it would increase the risk of flooding. To achieve this it expects local authorities to use their planning powers, and the NRA to assist by providing advice on development and flood risk. The work that is underway now on preparing flood plans is an example of this advice (see Section 7.1.1).

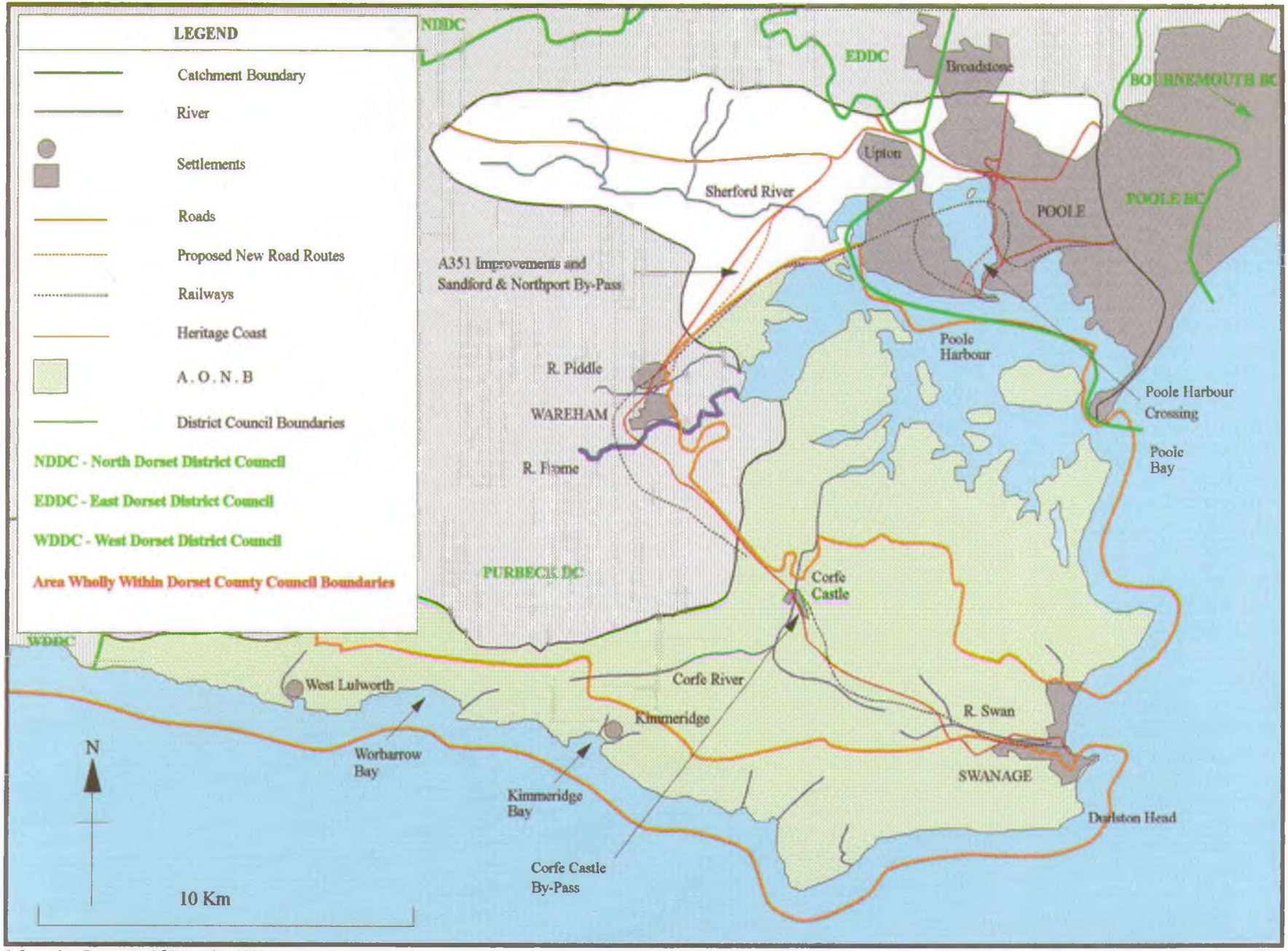
4.9.4. Development Plans

The Regional Planning Guidance for the South West was published in July 1994. This guidance recognises the need to achieve sustainable development and aims to influence the policies in Structure and Local Plans to secure the best development strategy for the region. We were involved in preparing this guidance, which includes advice on rivers, water supply and waste water disposal.

Dorset County Structure Plans

The Poole Harbour & Purbeck Catchment lies entirely within the county of Dorset. The approved plans for the area are the South East Dorset Structure Plan : First and Second Alterations, and the Dorset (excluding South East) Structure Plan : First and Second Alterations.

MAP 13 : POOLE HARBOUR & PURBECK CATCHMENT - DEVELOPMENT



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Both plans recognise that environmental constraints mean that development is likely to be limited in certain areas. The Area of Outstanding Natural Beauty (AONB), Heritage Coast designation, SSSIs and Groundwater Source Protection areas are all recognised as constraints to development..

The Dorset County Structure Plan Consultation Draft (November 1994) outlines the draft policy framework for development up to 2011. We support the principle in this plan that development will only be permitted if the necessary service infrastructure, including drainage, sewerage, sewage treatment and water supply is available or will be provided in order to protect or improve the water environment.

Minerals and Waste Development are dealt with in Sections 4.10 and 4.11.

District Wide Local Plans

Local plans are available for most of the catchment but these are being superseded by the authorities' District Wide Local Plans (DWLPs) which reflect the Structure Plan guidance for the period to 2001. The policies in the DWLPs set out the framework for land use change and (since the enactment of the Planning & Compensation Act 1991) provide the key reference in determining development applications.

Poole Borough Council

The current framework for control of development is established in the following statutory local plans; Poole Town Centre Local Plan (adopted 1987), Broadstone Creekmoor Local Plan (adopted 1987), and Poole Coastal Local Plan (adopted 1992). These plans all contain policies which seek to protect and enhance the water environment.

The DWLP for Poole Borough is being prepared and reflects structure plan guidance up to 2001. The Poole Local Plan contains policies which seek to protect and conserve the natural environment. The combination of green belt, sites of nature conservation interest (including RAMSAR sites, SPAs, proposed SACs, SSSIs, Nature Reserves and other sites) and the coastal zone mean that development is likely to be within currently developed areas. The plan, based on South East Dorset Structure Plan (2nd Alteration), indicates that structure plan requirements for housing have to a large extent already been met. Dorset County Structure Plan Consultation Draft identifies a need for 12,000 dwellings in Poole; the substantial majority would be provided through infill, conversion and redevelopment.

The DWLP includes policies to ensure that development is protected from tidal flooding, provides for the disposal of surface water and does not adversely impact the water environment due to inadequate water services.

There are a number of sites allocated where development may have an impact on the water environment.

These include comprehensive redevelopment of West Quay Road which allows for commercial, leisure and residential development, development of the Pitwines site, and further development of the commercial port area. Poole Harbour Commissioners propose a new boat haven at the eastern end of the Town Quay.

Purbeck District Council

The Purbeck Deposit Plan will not be available until spring 1996; the North East Purbeck Deposit Plan, the adopted Sandford & Northern Wareham Local Plan, the adopted Lytchett Matravers Local Plan, and the adopted Isle of Purbeck Local Plan are used for guidance.

The AONB, Heritage Coast, SSSIs and international conservation designations are all recognised as constraints on development. Most additional development is likely to be located in and around major settlements. An exception is the proposed development of 1000 dwellings at Holton Heath and 450 dwellings at Sandford identified in the North East Purbeck Local Plan. The disposal of surface water and foul sewage are issues that must be resolved before this scheme can progress.

The inadequacy of the combined foul and surface water drainage system in the Swanage and Langton Matravers area is recognised in the Isle of Purbeck Local Plan. The Plan contains an interim development control policy which constrains development until the Flood Alleviation Scheme and subsequent improvements to the foul sewerage system are complete. This is also constraining the expansion of Victoria Road Industrial Estate. There are a number of sites allocated where development may have an impact on the water environment including industrial sites at Upton Heath and small scale developments at Corfe Castle and Lytchett Matravers.

In June 1995, the Purbeck Heritage Committee published Keeping Purbeck Special - A Strategy for the Purbeck Heritage Area. This strategy has been developed to address a number of the pressures that are affecting Purbeck, including Land Use and the Rural Economy, Tourism and Traffic.

East Dorset District Council

A small part of the catchment falls within the East Dorset DC area and is covered by the adopted Corfe Mullen Local Plan; this includes the proposed landfill site at Beacon Hill which is discussed in Section 4.11.

Road Schemes

We are a statutory consultee to the Department of Transport for new trunk roads and advise County and District Councils on their own road schemes. We are involved throughout the process, from route choice to design and construction. Through consultation and negotiation we seek to protect all potentially impacted aspects of the water environment, and where appropriate to secure enhancements for the water environment

Road schemes identified in the catchment include :

- *A31 Harbour Crossing*
- *A351 Sandford Bypass*
- *A351 Corfe Castle Bypass*

Particular areas of concern are pollution risks during and after construction, flood risk from surface water runoff, damage to the amenity and wildlife value of rivers and wetlands. The disturbance of metals-contaminated sediments in Holes Bay during construction of the A31 Harbour Crossing is of concern.

4.10. Mineral Extraction

We recognise the economic importance of quarrying and extraction of sand, gravel, ball clay, oil and gas to the region. However, exploration and extraction can pollute and reduce flows in surface and groundwater locally and across catchments.

4.10.1 Our Objectives

To control the impact of mineral winning and quarrying activities on the water environment and to promote suitable after-use activities.

4.10.2 The Role of the NRA

Our role is to :

- *consent discharges from quarries and operational mines*
- *participate in contingency planning for pollution emergencies*
- *respond to Minerals Plans as a statutory consultee of the planning authority*

Areas of concern include :

- *the loss of aquifer material and groundwater resources as a result of extraction*
- *extraction often involves dewatering, sometimes for substantial periods of time, which can lead to a loss of water supply from nearby wells and boreholes, the removal of natural groundwater supplies to ponds and rivers, and can also affect wetlands*
- *removal of material from above the water table which reduces natural filtration and increases pollution risk to groundwaters*
- *the increased risk of pollution from plant or operations close to or below the water table*
- *the impact of suspended solids inputs to streams on salmonid spawning gravels and nursery areas*

In considering proposals, we will refer to our Policy and Practice for the Protection of Groundwater (PPPG). We will object to a new proposal for mineral extraction when there will be demonstrable harm to water resources or to the water environment, unless measures to mitigate any harm can be agreed in the planning controls.

4.10.3 Local Perspective

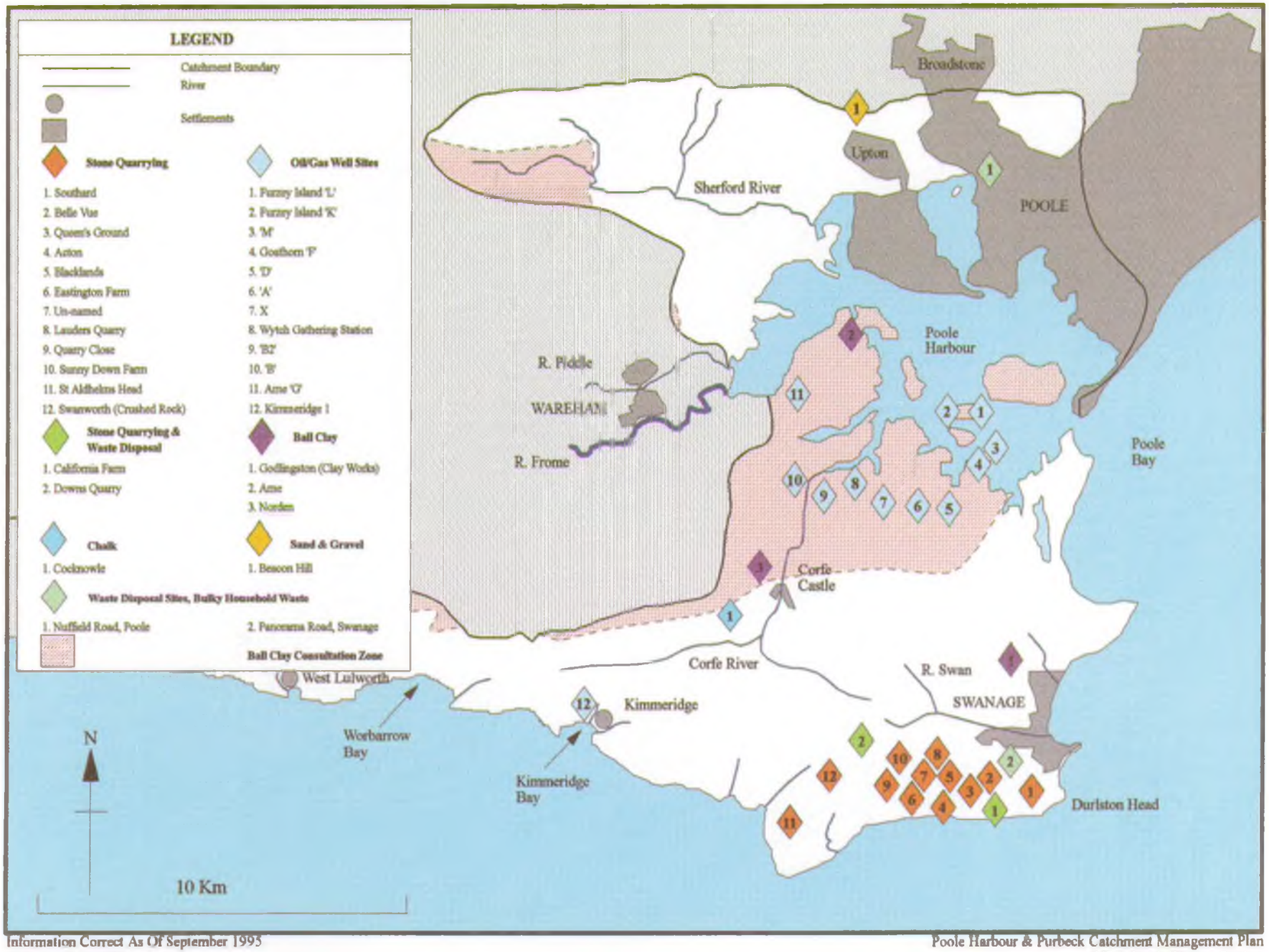
Minerals

There are existing small-scale quarries for Purbeck stone at Acton and south of Swanage, and there are proposals in the Dorset Minerals and Waste Local Plan Deposit Plan for further small-scale development in both areas to meet future needs. Swanworth Quarry at Worth Matravers is currently being worked for limestone. This site may be restored by limited infilling with inert waste.

Ball clay workings at Arne, Norden and Povington are on the catchment boundary, and are discussed in the Frome & Piddle CMP. There are clay workings and brickworks at Godlingston, near Swanage; silt-laden surface water runoff from this site has occasionally polluted local watercourses.

Chalk is quarried at Cocknowle, and there is one sand and gravel quarry in the catchment at Beacon Hill near Corfe Mullen. Silt-laden surface water runoff has also affected the adjacent heathland SSSI here.

MAP 14 : POOLE HARBOUR & PURBECK CATCHMENT - MINERAL EXTRACTION & WASTE DISPOSAL SITES



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Poole Harbour & Purbeck Catchment Management Plan
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At present seabed dredging for sand and gravel is confined to areas outside the catchment. However licences have been issued off the Purbeck coast and there is potential for more areas to be considered. Seabed dredging gives rise to a range of concerns about the effects on the seabed communities, fisheries and coastal defence.

The Dorset Minerals and Waste Local Plan Deposit Plan identifies three potential sites for development as aggregate wharves in Poole Harbour for importing marine dredged sand and gravel or crushed rock shipped from other south coast ports. A potential aggregate railhead at Holton Heath Trading Park is also proposed.

Oil and Gas

Although oil has been recovered at Kimmeridge for over 30 years, major finds were made in the late 1970s, and the Wytch Farm complex, operated by BP and situated in the Wytch Heath forestry plantation on the southern side of Poole Harbour, has now expanded into the sixth largest oilfield in Western Europe. The new wells being drilled from the Goathorn peninsula (Wellsite M) are among the longest, in a horizontal direction, in the world. Modest volumes of oil are produced at Kimmeridge (Map 14) and Wareham (see Frome & Piddle CMP) oilfields which are connected to the Wytch Farm development.

Well sites on the mainland and Furzey Island (Map 14) provide oil and gas to the Gathering Station at Wytch. After separation, sale gas goes directly into the grid and some 70,000 barrels of crude oil is piped daily to Fawley near Southampton. Liquefied Petroleum Gas (LPG) is loaded to rail tankers at Furzebrook, and joins the main railway line at Wareham to travel eastwards through Poole.

The potential for pollution is obviously a concern. Extensive pollution prevention measures are incorporated into site design and operation, and all sites have contingency plans for dealing with spillages of oil.

We control discharges from all oil production sites activities except discharges direct to the oil-bearing strata at Wellsite B2 from the Gathering Station, and those from the Furzebrook site; these are controlled by HMIP under IPC authorisations.

At the end of production, all facilities will be removed and the land reinstated to an acceptable and beneficial after-use.

Oil Spill Contingency

Individual companies have responsibilities for their own fuels and chemicals, as well as their own contingency plans.

Once spilled in the Harbour, the collection and disposal of oil would be a joint responsibility using pooled resources. The statutory responsibility for action in Poole Harbour following oil spills lies with four bodies :

- *NRA - for spills from land to inland and coastal waters or to ground*
- *PHC - for spills from vessels in the harbour*
- *MPCU - for spills from vessels in coastal waters*
- *DCC - for coastal cleanup*

We are working with all parties to define respective roles and responsibilities during an incident, and to ensure that these are clearly understood.

4.11. Solid Waste Disposal

Here we consider the disposal of waste to land. Waste disposal sites are currently licensed by the County Waste Regulation Authority (WRA) who make sure that sites do not endanger public health, cause pollution or spoil the local area. WRAs consult us on all applications for waste disposal licences and we recommend ways of avoiding water pollution. WRAs will merge with the NRA in April 1996 to form the Environment Agency.

Some wastes can be spread on farmland to improve the soil. We advise the WRA on ways of protecting the water environment from this activity. We have our own powers to deal with pollution arising from this activity.

4.11.1. Our Objectives

To prevent the pollution of ground and surface water or damage to wetlands caused by the disposal of waste to land.

4.11.2. The Role of the NRA

We have duties and powers to :

- *monitor the quality of water around waste disposal sites*
- *take enforcement action if pollution occurs*
- *consent and control the discharge of leachate from landfill sites*

Our work involves :

- *working with planning authorities to make sure that proposed landfill sites are not located where they will cause pollution of water*

4.11.3. Local Perspective

In Purbeck there is one licensed waste disposal site at Panorama Road (Swanage) which receives domestic refuse and bulky household wastes. Downs Quarry (Kingston) and Acton Quarry (near Langton Matravers) are licensed to receive inert construction and demolition wastes.

At Nuffield Road (Poole) there is a licensed waste transfer station where bulky household wastes are received and then transferred to White's Tip which is outside the catchment. Disused sites include Brook's Tip (Hamworthy), Nuffield Road and Holes Bay (Poole).

The Dorset Minerals and Waste Local Plan Deposit Plan identifies two proposals for waste disposal in the catchment. There is a proposal for limited infill with inert waste at Swanworth Quarry, Worth Matravers.

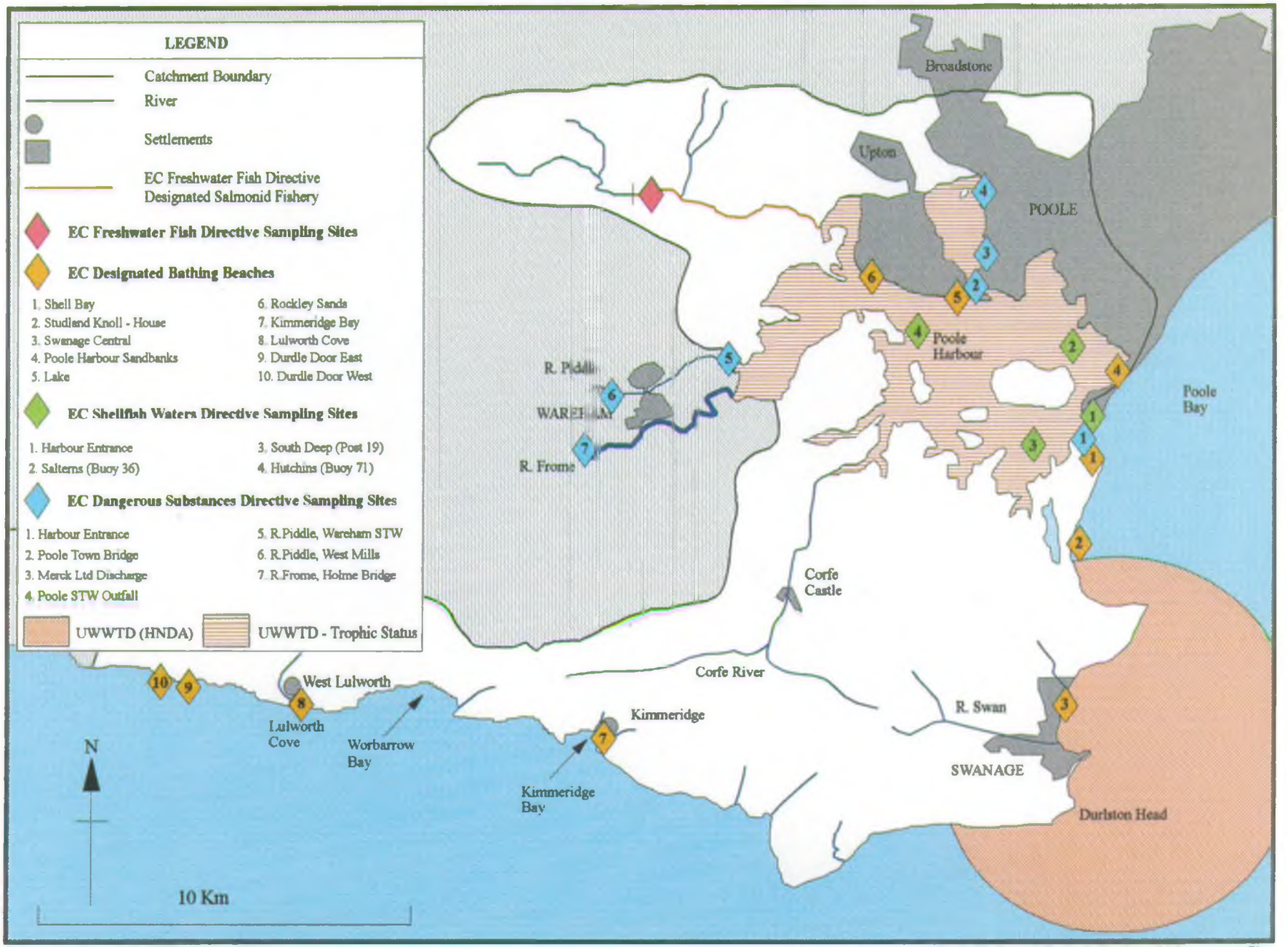
Beacon Hill near Corfe Mullen is also identified as a site where substantial infilling with biodegradable and inert waste would assist restoration. A planning application for this proposal has been refused by Dorset County Council on highway access grounds, and an appeal against the decision is currently taking place. All planning issues that relate to the water environment have been satisfactorily resolved. Should planning permission be granted our water interests would be protected in the waste management site licence which would cover the operational life of the site and incorporate necessary long term after-care measures.

Sewage Sludge Disposal

WWS have licensed sewage sludge lagoons at Slepe Farm and Pike Farm (Organford). In 1991/92, 89,577 tonnes of sewage sludge was applied to farmland in the Purbeck District and 9,356 tonnes in the Poole area (Consultation Draft Dorset Minerals and Waste Local Plan, Technical Appendices 1-6).

WWS informally consult us about sewage sludge applications to farm land. All applications of sludge must comply with the Code of Good Agricultural Practice for the Protection of Water. There have been occasional pollution incidents as a result of this activity, most notably in the Sherford catchment.

MAP 15 : POOLE HARBOUR & PURBECK CATCHMENT - EC DIRECTIVES MONITORING



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Poole Harbour & Purbeck Catchment Management Plan
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5. WATER QUALITY - CATCHMENT STATUS

We aim to maintain and where appropriate improve the quality of water for all those who use it. This is achieved by setting water quality targets for the catchment based on :

- *standards laid down in EC Directives*
- *international commitments to reduce the amount of Annex 1A substances entering tidal waters*
- *River Quality Objectives to protect recognised uses*

In this chapter, we report on the state of the catchment by comparing existing water quality with relevant water quality targets, and identify issues where targets are not being achieved and action is needed to improve water quality. We also discuss other water quality issues in the catchment.

5.1. EC Directives

There are six EC Directives which currently apply to the Poole Harbour & Purbeck Catchment, and the designated stretches and sites are shown on Map 15.

5.1.1. EC Freshwater Fish Directive

The Freshwater Fish Directive *on the quality of waters needing protection or improvement in order to support fish life* (78/659/EEC) ensures that water quality in designated stretches of water is suitable for supporting certain types of fish.

This Directive contains two sets of quality standards, one at levels to support a cyprinid or coarse fish population and another set at stricter levels to support a salmonid or game fish population. There are two sets of standards for each fishery type : imperative standards, which must be achieved, and guideline standards (Appendix 10.4), which Member States should aim to achieve.

We are responsible for monitoring the quality of identified fisheries and reporting the results to DoE who decide whether the standards in the Directive have been met. Where the requirements of this Directive are not met, we are responsible for identifying sources of pollution and making sure that improvements are made.

State of the Catchment

The Sherford from Sherford Bridge to Poole Harbour has been designated as a salmonid fishery. The imperative standards specified under this Directive were met in 1992, 1993 and 1994.

5.1.2. EC Bathing Waters Directive

The Bathing Waters Directive *concerning the quality of bathing water* (76/160/EEC) protects the environment and public health of bathing waters, by reducing pollution entering identified bathing areas. The Directive contains standards for nineteen microbiological, physical and chemical parameters (Appendix 10.5) to assess bathing water quality, but compliance is assessed mainly by standards for bacteria found in sewage (total and faecal coliforms).

We are responsible for monitoring the quality of identified, popular bathing waters and providing the results to DoE who decide whether the standards in the Directive have been met. Where identified bathing waters fail to meet the Directive, we are responsible for identifying sources of pollution that are causing failures, and making sure that improvements are made.

State of the Catchment

There are ten identified EC Bathing waters in this catchment, and these are shown below.

Site Name	Compliance								
	1986	1987	1988	1989	1990	1991	1992	1993	1994
Durdle Door West		Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Durdle Door East		Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Lulworth Cove		Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Kimmeridge		Pass	Pass	Pass	Pass	Pass	Pass	Fail	Fail
Swanage Central	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Fail	Pass
Studland, Knoll House		Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Shell Bay North		Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Poole, Sandbanks	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Poole, Rockley Sands		Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Poole, Lake		Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass

Only Poole Harbour Sandbanks and Swanage Central were identified in 1986. Based on operational monitoring in 1986, Poole, Rockley Sands would have exceeded the Directive's Imperative standards

The bathing waters at Swanage failed to comply with the directive in 1993. The cause of the failure is combined sewer overflows (CSOs) discharging in the vicinity of this bathing water. Improvements to an estimated 16 CSOs will be carried out by WWS under their AMP2 investment programme.

The bathing waters at Kimmeridge failed to comply with the directive in 1993 and 1994. The principal source of bacteria to Kimmeridge Bay is the North Kimmeridge Stream which receives discharges from private septic tanks and soakaways, as well as an unconsented public toilet. The shallow waters of Kimmeridge Bay, coupled with the effects of wind and tides, means that contaminated water tends to be retained in the bay. We are continuing to negotiate with the Smedmore Estate to secure improvements.

Issue 1. Non-compliance with EC Bathing Waters Directive standards at Swanage bays

Issue 2. Non-compliance with EC Bathing Waters Directive standards at Kimmeridge Bay

5.1.3. EC Dangerous Substances Directive

The Dangerous Substances Directive *on pollution caused by certain substances discharged in the aquatic environment of the community* (76/464/EEC) protects the water environment by controlling discharges to rivers, estuaries and coastal waters.

This Directive describes two lists of compounds. List I contains substances regarded as particularly dangerous because they are toxic, they persist in the environment and they bioaccumulate. Discharges containing List I substances must be controlled by Environmental Quality Standards (EQSs) issued through Daughter Directives (Appendix 10.6). List II contains substances which are considered to be less dangerous but which still can have a harmful effect on the water environment. Discharges of List II substances are controlled by EQSs set by the individual Member States (Appendix 10.6).

We are responsible for authorising, limiting and monitoring dangerous substances in discharges. We are also responsible for monitoring the quality of waters receiving discharges which contain Dangerous Substances and reporting the results to DoE who decide whether the standards in the Directive have been met. Where the requirements of this Directive are not met, we are responsible for identifying sources of pollution and making sure that improvements are made.

State of the Catchment

We monitor the Piddle downstream of Wareham STW for the List I substance cadmium. We also monitor Poole Harbour downstream of Poole STW for the List I substances cadmium, mercury, carbon tetrachloride and chloroform, and the List II substances arsenic, copper, zinc, iron, lead, chromium and nickel. In addition there is a national network site at the entrance to Poole Harbour where we monitor background concentrations of List I substances.

The EQS for cadmium was met in the Piddle in the period 1992 to 1994; the EQSs for all substances except cadmium were met in Poole Harbour downstream of Poole STW and at the national network site. In 1992, cadmium at these two sites had exceeded EQSs; the cause of the apparently high concentrations was the use of an inappropriate method of analysis. Since then we have improved the analytical method, and no further exceedences have occurred.

5.1.4. EC Shellfish Waters Directive

The Directive *on the quality required of shellfish waters* (79/923/EEC) protects shellfish populations (defined as bivalve and gastropod molluscs) from harm caused by pollution. This Directive specifies quality standards (Appendix 10.7) for waters supporting designated shellfish populations.

We are responsible for monitoring the quality of designated shellfish waters and reporting the results to DoE who decide whether the standards in the Directive have been met. Where the requirements of this Directive are not met, we are responsible for identifying sources of pollution and making sure that improvements are made.

State of the Catchment

The standard for copper was exceeded at Salterns (Buoy 36) and South Deep (Post 19) in 1992, and at Hutchins (Buoy 71) in 1994. The cause of the failures is unknown and we will be carrying out investigations to determine the cause.

In 1993 the site Salterns (Buoy 36) exceeded the standard for zinc. This was due to one result which we believe was atypical. No further work is planned to determine the cause of this failure.

Issue 3. Failure to meet standards for copper and zinc at some designated EC Shellfish Waters in Poole Harbour

5.1.5. EC Urban Waste Water Treatment Directive

The EC Directive *concerning urban wastewater treatment* (91/271/EEC) specifies minimum standards for levels of sewage treatment and collection systems.

This Directive specifies secondary treatment for all discharges serving population equivalents greater than 2,000 to inland waters and estuaries, and those greater than 10,000 to coastal waters. Discharges below these population equivalents receive appropriate treatment as defined in the AMP2 guidance note (see Section 4.2.3). We are responsible for making sure that discharges receive the level of treatment specified in this Directive (Appendix 10.8).

The outfall at Lulworth has been identified as requiring fine screening (now installed) and possible outfall relocation under the appropriate treatment provisions in the Directive. This work will be completed by 2005.

This Directive also allows higher standards of treatment for discharges to *sensitive* areas, and lower standards of treatment to *less sensitive* areas.

Sensitive areas are those waters which receive discharges serving population equivalents of greater than 10,000, and are or may become eutrophic in the near future. We carry out monitoring of potentially sensitive areas, and present this information to DoE who decide whether the watercourse is sensitive. We then ensure that discharges to such sensitive areas receive a higher level of treatment.

Less sensitive areas or High Natural Dispersion Areas (HNDAs) are those estuarine or coastal waters which are naturally very dispersive. In these areas, a lower level of sewage treatment is required. However, dischargers must demonstrate that no additional harm will be caused to the environment by the lower level of treatment by carrying out detailed *comprehensive studies*. We are responsible for ensuring that these studies are carried out correctly.

State of the Catchment

We have identified Poole Harbour as a candidate sensitive area. It has one direct qualifying discharge Poole STW, and two indirect qualifying discharges, Dorchester STW and Wareham STW. We will carry out monitoring during 1995 and 1996 to determine whether Poole Harbour is eutrophic, and to identify the principle sources of nutrients to the Harbour.

Issue 4. Ddetermine whether Poole Harbour is a sensitive area under the UWWTD

DoE, in consultation with us, have proposed the area around Swanage as an HNDA. The Swanage outfall has been identified as requiring primary treatment by 2000, with possible outfall relocation by 2005. WWS will be carrying out comprehensive studies to establish whether the lower level of treatment at the Swanage outfall will cause any additional adverse effects. We will be working closely with WWS on these studies.

Issue 5. Establish required level of treatment at Swanage under UWWTD

5.1.6. EC Shellfish Hygiene Directive

The Shellfish Hygiene Directive *laying down the health conditions for the production and the placing on the market of live bivalve molluscs* (91/492/EC) protects the public health of consumers of live bivalve molluscs, for example mussels and oysters. This Directive defines standards for shellfish quality required in the end product. It also classifies bivalve mollusc shellfish harvesting areas into four categories according to the concentrations of bacteria found in the shellfish flesh (Appendix 10.9).

The Ministry of Agriculture, Fisheries and Food (MAFF) and the Department of Health (DoH) share responsibility for this Directive in England and Wales and we only have a minor role in the implementation of this Directive. Although we provide information on the location of discharges which may affect harvesting areas, we cannot control the quality of discharges using this Directive.

State of the Catchment

All areas in Poole Harbour which are harvested for oysters, clams and mussels have been identified as Class B. This means that shellfish require depuration, heat treatment or relaying prior to marketing.

5.2. Annex 1A Reduction Programme

At the Second (1987) and Third (1990) North Sea Conferences, the UK Government made a commitment to reduce the loads of certain substances known as Annex 1A substances (Appendix 10.10) entering tidal waters from rivers and direct discharges. Annex 1A substances are those which

are toxic, persistent and which bioaccumulate. Loads of most Annex 1A substances are to be reduced by 50%, but mercury, cadmium and lead are to be reduced by 70%. These reductions are to be achieved by 1995 compared to a 1985 baseline (or a 1991/1992 baseline where data for 1985 is unavailable).

We are responsible for carrying out monitoring and identifying significant sources of these substances in England and Wales. We do this by ranking inputs from rivers and direct discharges according to the size of load. Those inputs which contribute to 95% of the total load are said to be significant. In accordance with DoE guidelines we identify where reductions can be made.

State of the Catchment

We monitor the discharges from Poole STW and Merck Ltd for Annex 1A substances. The discharge from Merck Ltd has never been recorded as a significant Annex 1A site.

Significant loads of gamma HCH and nickel were recorded at Poole STW in 1991 and 1993, respectively. Although loads of nickel are significant as measured under Annex 1A (this includes a measurement of flow), they meet the EQS for dissolved nickel concentrations under the EC Dangerous Substances Directive (see Section 5.1.3).

We have reviewed the consent for Poole STW to include conditions for gamma HCH and nickel to ensure that loads of these substances do not increase (see Section 4.2.3 and 4.2.4).

The UKAEA Winfrith sea outfall at Arish Mell is monitored under Annex 1A but a review of current data shows it not to be a significant discharge.

Issue 6. Significant loads of nickel and gamma HCH entering Poole Harbour from Poole STW

5.3. River Quality Objectives

The water quality targets that we use in all rivers are known as River Quality Objectives (RQOs). RQOs are used for managing water quality and are based on the River Ecosystem (RE) classification scheme. This scheme is made up of five water quality classes (RE1 to RE5), which reflect the chemical quality needed for different types of river ecosystem (including the types of fishery they can support, Appendix 10.11).

The RE classification scheme replaces the National Water Council (NWC) system that was previously used by the NRA. We have published a manual entitled Water Quality Objectives : Procedures used by the NRA for the purpose of the surface waters (River Ecosystem)(Classification) Regulations 1994.

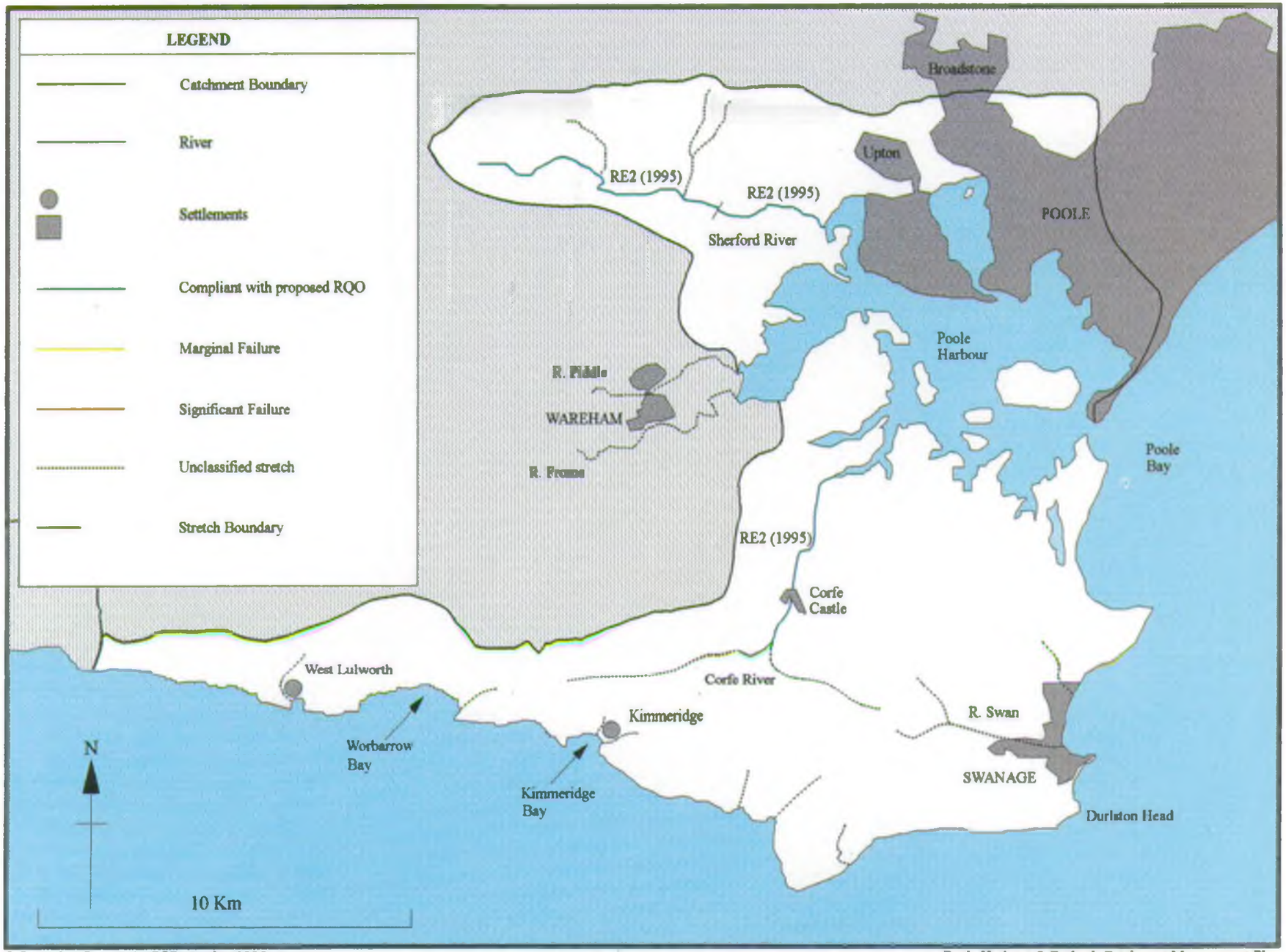
5.3.1. RQOs for the Poole Harbour & Purbeck Catchment

The RQOs based on the RE classification which we are proposing for the catchment are shown on Map 16. These RQOs will apply from the date shown next to the class; for example RE2 (1996), means that an RQO of RE Class 2 must be achieved from 1 January 1996.

State of the Catchment

Map 16 also shows current compliance with its RQO. This assessment is based on three years of routine monitoring data from the Public Register collected between 1992 and 1994. All three monitored stretches in the catchments comply with their RQOs.

MAP 16 : POOLE HARBOUR & PURBECK CATCHMENT - COMPLIANCE WITH PROPOSED RIVER QUALITY OBJECTIVES (RE CLASSIFICATION)



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5.4. Additional Monitoring

As well as the work we carry out to meet the requirements of RQOs, EC Directives and other international commitments, we carry out additional monitoring which helps us to determine the state of water quality in the Poole Harbour & Purbeck Catchment.

5.4.1. Non-Designated Bathing Waters

We monitor the quality of Swanage North and South beaches which are non-designated bathing beaches under the Directive but still popular recreational areas. The bathing beach monitoring period is May to September (inclusive).

Comparing sampling data collected from 1993 to date against the EC Bathing Waters Directive for bacteria found in sewage (total and faecal coliforms), Swanage North and South would have failed against the Directive standards in 1993 and 1994, if they had been designated bathing beaches. Additionally Swanage South has exceeded the limits once in 1995. These data relate to specific samples taken at a particular time rather than an overall pass or fail for the years mentioned.

It is hoped the planned work to CSOs in Swanage (see Section 4.2.3 and 5.1.2) will help improve the situation on these beaches as well as the designated bathing beach.

5.4.2. Bioaccumulation

We have carried out an annual monitoring programme which measures the levels of metals and organic residues in seaweeds, limpets and mussels to provide information on the levels and bioavailability of these pollutants.

Several of the sites are along the Purbeck Coast : Lulworth Cove, Kimmeridge Bay, Winspit, Swanage, Studland and Sandbanks. Data is available from 1991 to the present, and sporadically from 1980 to 1989. A single site at North Haven within Poole Harbour has only been sampled once, in 1980. An annual bioaccumulation programme reveals temporal and spatial changes in the levels of inputs to the marine environment.

Nine metals have been monitored for the South Coast sites; the Purbeck coast sites had the highest residues of arsenic, chromium, mercury and zinc, and the second highest residues of copper and lead. Studland was particularly high in chromium, lead, zinc, arsenic and mercury. These sites also had many of the highest or only records of organics, particularly Sandbanks (PCBs) and Swanage (various).

Issue 7. Bioaccumulation of metals and organic residues in marine organisms

5.4.3. Marine Biological Studies

Outfall Studies

A marine biological survey undertaken in 1991, to investigate the impact of Poole STW (White, 1991), showed significant degradation of fauna and sediments close to the outfall and that sediment metal levels were elevated compared to other sheltered parts of Poole Harbour. A repeat survey was recommended to investigate whether the redevelopment at the works has led to improvements in the benthic communities and sediment chemical levels within Holes Bay.

Biological data was collected in 1994 by divers to investigate the impact of the Lulworth outfall on the local biological community. The report suggested evidence of eutrophication close to the outfall, it is proposed to carry out a second survey in 1996 to distinguish whether the installation of screens has had a beneficial effect on the biology.

Biological samples were collected from Swanage Bay in 1993 to investigate the impact of the sewage outfall. It was recommended that further sediment pollution data be collected, and a biological diver survey of the outfall commissioned.

Issue 8. Impact of sea outfalls on the marine environment

Algal Monitoring

Planktonic algae in bloom proportions are indicative of eutrophic conditions. During 1993 samples were taken throughout Poole Harbour as part of a survey to establish whether it could be defined as a sensitive area under the UWWTD (Perkins, 1993). Two notable blooms were revealed.

As part of the UWWTD, aerial photographs were taken in 1995 to estimate the percentage cover of larger green seaweeds within Poole Harbour. At high densities these may also indicate eutrophic conditions.

Poole Park Lake

Reports of an unusual algal bloom in the lake were reported to the NRA from mid-August to mid-September 1995. Subsequent identification revealed that the bloom consisted of two potentially-toxic blue-green algae, Oscillatoria sp and Anabaena sp. Algal populations were regularly monitored and occasionally reached levels considered to represent a health risk. As a result the lake was closed for a period of time for water-based activities such as windsurfing and boating.

5.4.4. Biological Monitoring

The ecological quality of the freshwater catchment is monitored using benthic macroinvertebrates, the small animals which live in the river. They are unable to move far and reflect long-term conditions within the watercourse, providing an overall indication of the ecological condition of the river.

We collect samples from the river and make a list of the different families (taxa) of macroinvertebrates present. We compare the range of families found to what we would expect to find in a similar unpolluted river using the BMWP scoring system, and we use this information to classify rivers.

There is limited freshwater information for the catchment. The most recent classification on the Sherford at Organford (1990) indicated a good water quality as did the site for the Corfe at Corfe Castle (1990).

In 1994 a survey was carried out on the streams flowing into Kimmeridge Bay; the Kimmeridge Dairy Stream was found to be significantly affected by organic waste.

The National Biological GQA survey is being conducted during 1995, and all routine river sites will be sampled during the year.

5.4.5. Groundwater Quality

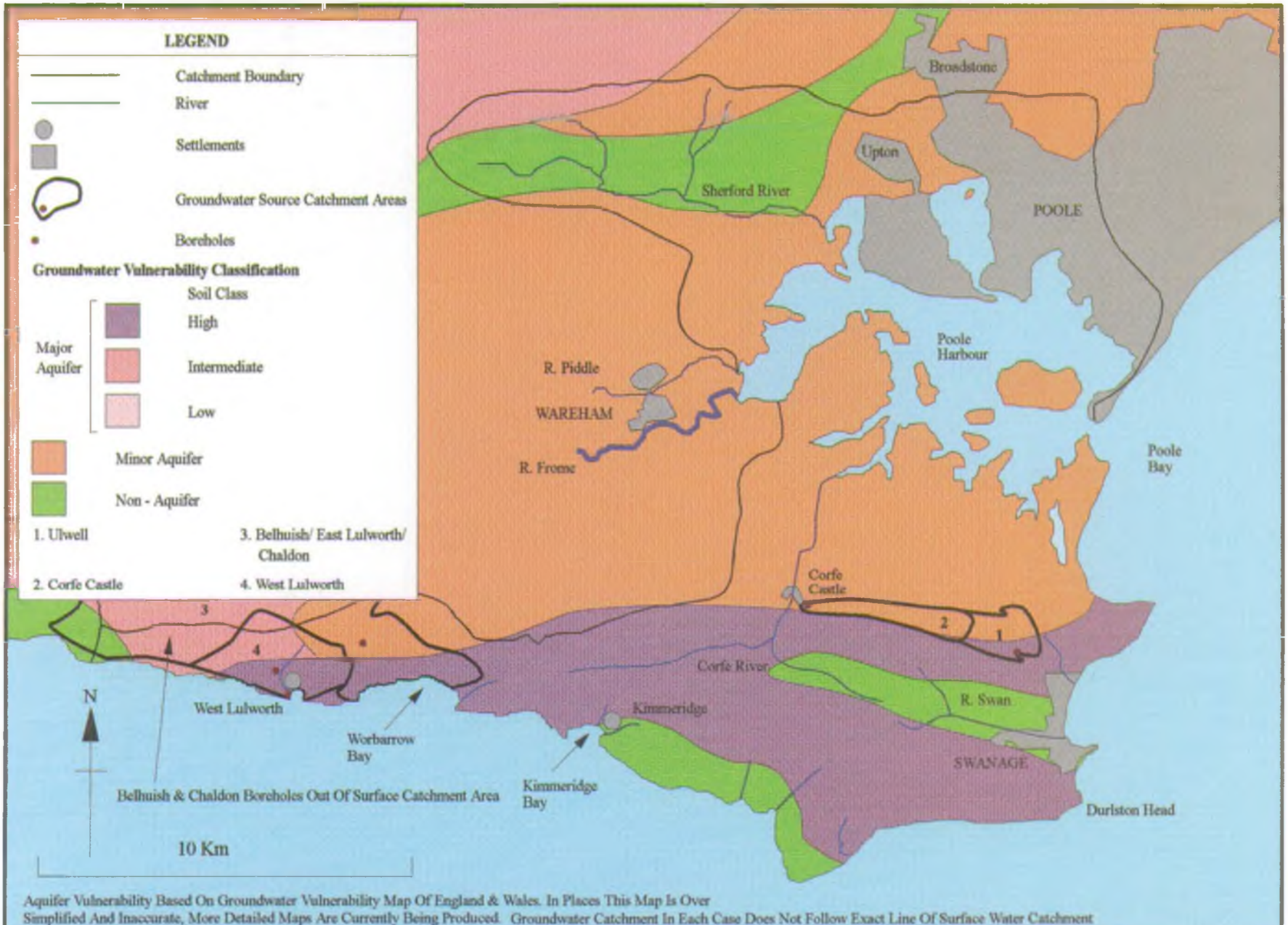
The protection of aquifers from pollution is of great importance, as the contamination of groundwater may put public supplies at risk. Contamination of groundwater may impact on river water quality where the baseflow is entirely dependant on groundwater.

The Policy and Practice for the Protection of Groundwater (PPPG) (NRA 1992) contains policy statements on the following aspects of groundwater protection :

- *physical disturbance of aquifers affecting quality and quantity*
- *waste disposal to land*
- *contaminated land*
- *disposal of sludges and slurries to land*
- *discharges to underground strata*
- *diffuse pollution*
- *other activities affecting groundwater quality*

We commit substantial resources to groundwater protection, and apply the PPPG through our own authorisations (discharge consents and abstraction licences). We also seek to protect groundwater quality in our role as a statutory consultee to the planning authorities.

MAP 17 : POOLE HARBOUR & PURBECK CATCHMENT - GROUNDWATER PROTECTION POLICY



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6. WATER QUANTITY - CATCHMENT STATUS

We aim to manage water resources to achieve the right balance between the needs of the environment and those of the abstractors. In this section we will assess the state of water resources in the catchment. We will also consider how the water environment is affected by abstraction and look at the needs of the abstractors. In particular we will discuss the obligations we have to ensure that there is adequate water for public supply.

The Water Resource Development Strategy for South Western Region - Tomorrow's Water sets out how we would like to see water resources developed in the future. This Strategy follows the principles of sustainable development with proper safeguards for the environment.

To promote our strategy for the region we will :

- *encourage the efficient use of water*
- *expect abstractors to use existing sources efficiently before new sources are developed*
- *approve developments that cause the minimum problems for the environment*
- *study rivers stressed by abstraction and solve existing environmental problems where benefits outweigh the costs and funds can be found*

Here are three examples of our approach to managing water resources in the catchment :

- *we plan for the sustainable development of water resources, developing criteria to assess the reasonable need of abstractors and the environment*
- *we plan the future use of water on the basis that water supply companies reduce leakage to an acceptable level and make best use of available resources*
- *we study the spending plans of the water supply companies (AMP2), to ensure that these plans do not overlook opportunities to improve flows in rivers which are stressed by abstraction*

6.1. Public Water Supply Options in the Catchment

The WWS Dorset Supply Zone, in which this catchment falls, currently has a surplus in available yield. NRA predictions estimate the resource-demand balance will remain in surplus for high and low forecasts until 2002, with deficits only occurring after that under the high forecasts.

The additional licensed resources at Lulworth are expected to be sufficient to meet future PWS demand within the catchment as well as helping meet future needs in the neighbouring Frome & Piddle catchments, and no further local schemes are planned (see also Frome & Piddle CMP)

If current forecasts prove too low, strategic resource development schemes are likely to be developed in neighbouring catchments enabling higher demands within this catchment to be met by redistribution of existing resources, conjunctive use arrangements, or local importation of resources.

To reduce abstraction in the Piddle catchment, WWS are investigating two potential sources in the Sherford catchment, at Bulbury and Lytchett Minster. Boreholes at both have been test pumped and we will promote the construction of a groundwater model of the chalk aquifer as the best method of assessing likely impact of the development of these sources.

We must be satisfied that existing resources are managed properly before any new resources are developed.

Issue 9. Impact of development of water resources at Bulbury and Lytchett Minster boreholes

6.2. Future Demand

We know of no new demands for water in this catchment except those generated from planned developments and growth.

Licences for any future developments will only be granted where local resources are available and the need is justified. Any licences granted will be subject to conditions to ensure they will not cause derogation of existing protected rights, or adversely impact in-river uses or the river environment. Regional policy will be refined as more detailed knowledge on habitats and environmental needs emerges.

A National R&D project is in hand which is assessing methods of managing licensing where surface water resources are becoming stretched. This is scheduled to report during 1995. When available, a review will be undertaken to assess whether there is a need to adopt changes to current licensing policy for the catchment to ensure the right balance is maintained between resources made available for abstractive uses and those retained for meeting in-river needs of the catchment.

7. FLOOD DEFENCE - CATCHMENT STATUS

7.1. Flood Defence Management Framework

The Flood Defence Management Framework (FDMF) will direct how we provide flood defence in the future. The Framework applies to the main river system, and considers any control structures or flood defences as assets to be managed in a consistent, cost-effective manner, based on the use and consequent value of the land they protect.

Current land uses are surveyed, and appropriate Standards of Service (SoS) for the protecting assets are established. Where there is a difference between SoS currently provided and those required now or in the future, the appropriate action will be established through consultation with interested parties.

The FDMF depends on collecting the necessary data from Section 105 Surveys and Asset Surveys.

Issue 10. A fully integrated Flood Defence Management Framework

7.1.1. Mapping Flood Problems

Surveys of flood risks will be carried out under S105 of the Water Resources Act 1991 to include both floodplain mapping and a survey of flooding problems. These will update national surveys of flooding problems carried out under S24 of the Water Act 1973.

The NRA has signed a Memorandum of Understanding with the Association of Metropolitan Authorities and the Association of County Councils to complete S105 surveys, and we are currently looking at the best way to do this work. A pilot study is now taking place on the West Dorset Rivers.

The S105 surveys will be used for both our own flood defence management and to advise planning authorities on development and flood risk issues.

Issue 11. Improved identification of flood risk areas

7.1.2. Asset Surveys

The NRA is surveying assets to assess their condition and maintenance requirements. This will be completed by 1996, and we expect it to confirm that only about 10% of all existing river control structures are owned by the NRA.

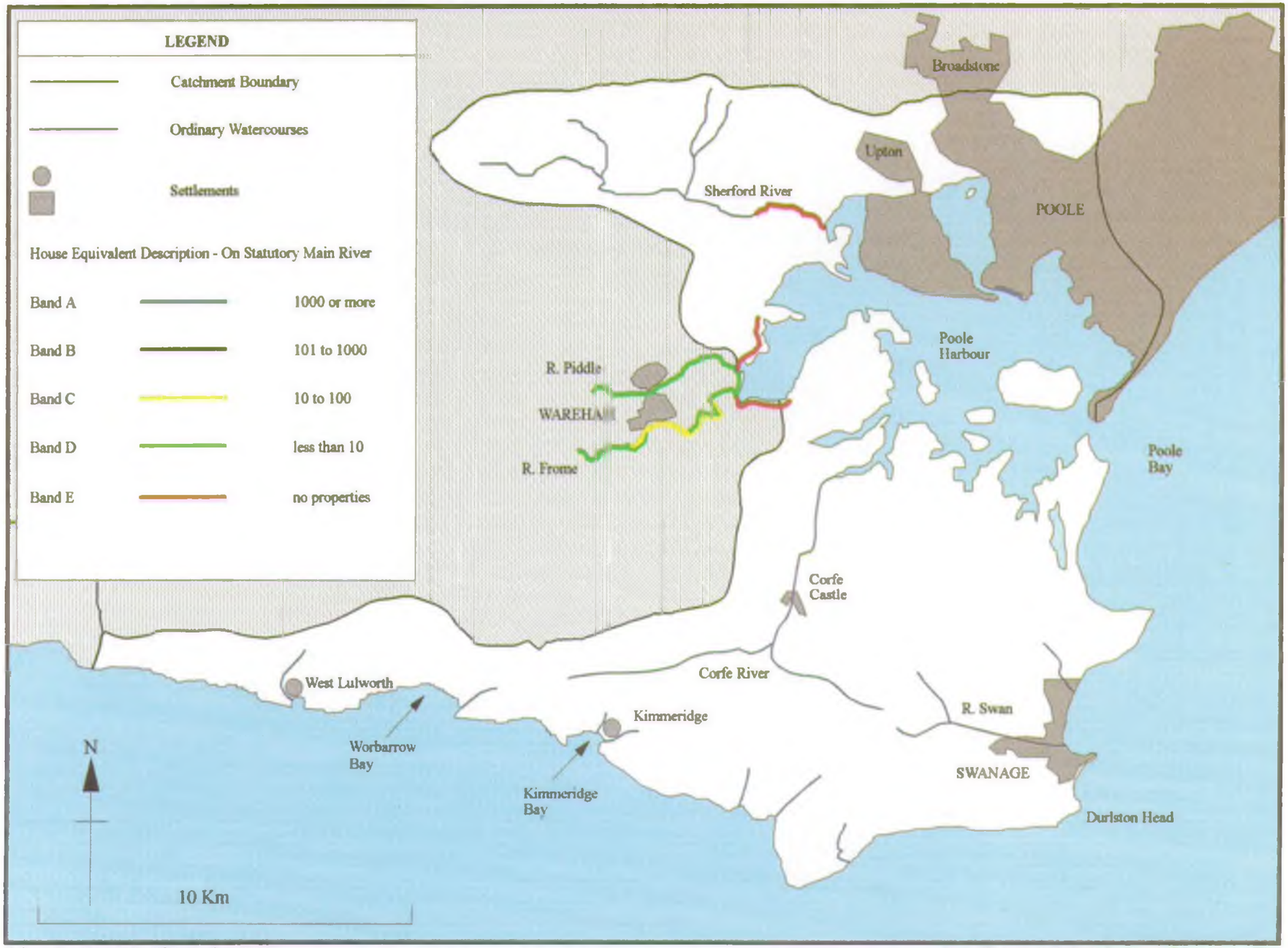
7.1.3. Standards of Service

Flood events are usually described in terms of the frequency with which they can be expected to occur. Hence a 1 in 10 year flood can be expected to be equalled or exceeded once every ten years on average. This is also described as the return period, although the interval before another similar event returns is subject to chance and only averages out over a long period.

The Standard of Service at a location is expressed as the worst flood event which can be withstood without significant flooding.

We use standard units called House Equivalents (HE) to convert different types of land use into a land value. Land use is converted into HE per kilometre, and Map 18 identifies HE values within the catchment. This standard measure can be used as a basis for determining maintenance requirements or the need for improvements based on the land use and associated value of the adjacent land.

MAP 18 : POOLE HARBOUR & PURBECK CATCHMENT - STANDARDS OF SERVICE



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7.2. Maintenance

Maintenance work is undertaken to ensure the efficient working of the natural drainage system, and to ensure that flood alleviation schemes provide protection up to their design standard.

The SoS methodology underpins much of this work by assessing land use in the floodplain and monitoring the achievement or otherwise of the target SoS. Remedial work is considered for areas not achieving their target SoS. River reaches were accorded this classification in 1990; the NRA sea and tidal defence survey has been completed and the SoS methodology is being introduced.

7.2.1. Tidal Defences

There are tidal defences on the Frome and Piddle that extend upstream to Wareham. The maintenance of these defences is considered in the Frome & Piddle CMP.

Along the tidal reaches of the Frome, speed limits of pleasure craft are controlled by an NRA river patrol. The wash from speeding boats severely erodes the base of the tidal defences and causes damage that is difficult and expensive to repair. Cooperation with Poole Harbour Commissioners and the local police ensures that methods of speed control are effective.

7.2.2. Sea defences

A sea defence survey was undertaken in the Poole and Purbeck area in 1991. It consisted of NRA owned defences (only one at Green Gardens, Poole), with the remainder in Local Authority or private ownership or control, some in poor condition. The scheme at Green Gardens is designed to a 1 in 100 year level of protection which includes an allowance for sea level rise and wave action. Although currently offering some level of protection, the full 1 in 100 year standard will not be provided until the defences are extended along the adjacent areas. In general the Poole Quay area is only protected to a standard of between 1 in 2 years to 1 in 20 years(see Section 7.3.1).

7.2.3. River Defences

In this catchment, the only statutory main river flowing into Poole Harbour is the Sherford. At present there is no justification to undertake regular maintenance work on this stretch of river.

7.3. Flood Defence Improvements

Flood defence improvement works may be carried out where the SoS is below indicative standard. All schemes must satisfy technical, economic and environmental criteria and we maintain a Programme of Capital Works for the future which takes account of the priority of each. Although inclusion in the programme indicates a budget provision, each scheme must satisfy the appraisal criteria before it can proceed. It should also be noted that all schemes are subject to approval by the Flood Defence Committee and are usually dependent upon grant aid from MAFF.

Different types of land and property need different levels of protection. For improvement works we use the following indicative standards.

Current Land-Use	Return Period (years) in Tidal Waters	Return Period (years) in Non-Tidal Waters
High density urban, containing significant residential and non-residential property	200	100
Medium density urban	150	75
Low density or rural communities	50	25
Generally arable farming with isolated properties	20	10
Low productivity land with few properties	5	1

Indicative standards do not indicate an entitlement or minimum level to be aimed at. It is also important to note that flood defence schemes alleviate flooding up to a design period, but a worse event may still occur.

7.3.1. Poole Harbour

Property bordering Poole Harbour is at risk from flooding, and the risks will increase as a result of predicted sea level rise (currently taken as 5mm per year). £318,000 has been allocated in the capital programme for works at Town Quay for the year 1997/98; schemes to improve further lengths of defence will be investigated. Joint schemes with Poole BC are anticipated, including extensions to the existing Green Gardens scheme.

Issue 12. Flood protection at Town Quay, Poole

7.3.2. Swan

This catchment has suffered from severe floods, mainly from thunderstorm activity. The urban FAS at Swanage was promoted by Purbeck DC and is now partly complete. When finished it will offer the area a 1 in 100 year level of protection. The Swan catchment is prone to flash floods. If the Swanage FAS is taken over by the NRA, we will install telemetry at strategic locations to warn us of heavy rain or blockages.

Issue 13. Operation of Swanage FAS if adopted by NRA

7.4. Emergency Response

Absolute flood protection is not possible; because of this we need to warn people when there is a risk of flooding. We have a strategy (ERLOS) which details how these procedures operate, and which we use to improve our emergency response.

The sea defences at Green Gardens and Poole Quay are vulnerable to wave attack. This can be exacerbated by a combination of high river levels and high tide. Telemetry raingauges at Poole and Swanage, radar and meteorological predictions are all used in an emergency.

Due to the unpredictable interaction of wind, surge, wave and tide, a response time of two and half hours has been chosen at Poole Harbour. As new flood defence schemes are developed at Poole Harbour, tidal level monitoring should be incorporated to improve provision of flood warning.

Issue 14. Ensure the adequate provision of flood warning in the catchment

The Green Gardens, Poole defence includes a flood gate that is installed across the slipway access. Conflicts can arise with access for boat transport at times. Operational manpower is normally utilised at Christchurch Harbour, Portland and West Bay so it is not normal to have observers stationed at Poole unless the conditions are exceptionally adverse.

Issue 15. Operation and manning of Green Gardens, Poole FAS

7.5. Coastal Defence - Shoreline Management Plans

Shoreline Management Plans set out the coastal defence strategy for lengths of coast, taking into account natural coastal processes, human and other environmental influences and needs. They are promoted by coastal defence authorities such as the NRA and district and borough councils, and used in local authority development plans and coastal zone management.

There are two such plans in preparation that cover this length of coast, the first extending from Durlston Head eastwards to Hurst Spit and the second from Durlston Head westwards to Portland Bill. We are represented on both coastal groups promoting these plans.

Issue 16. Development of an integrated coastal defence strategy

8. PHYSICAL FEATURES AND WETLAND WILDLIFE - CATCHMENT STATUS

8.1. Fisheries

We have no fish hatcheries within the Poole Harbour & Purbeck Catchment, and no mitigation or rehabilitation stocking takes place. We concentrate instead on maintaining high quality habitat and controlling exploitation to sustain naturally breeding stocks.

There are good areas for spawning and nursery on the Sherford upstream of Organford. Densities of juvenile trout are high compared with other local streams, which is typical of a population with a large migratory component.

Not enough is known about the fish populations in the Corfe to comment on the relative importance of different areas. However, it is likely that virtually all of the non-tidal river is suitable for salmonid spawning and nursery.

No detailed information is available on the movements of salmon and sea trout in the Harbour. Information is also lacking on the abundance, distribution, timing of runs and destination for twaite shad and smelt.

Issue 17. Lack of knowledge of populations of non-salmonid migratory fish

8.2. Obstructions to the Free Movement of Fish

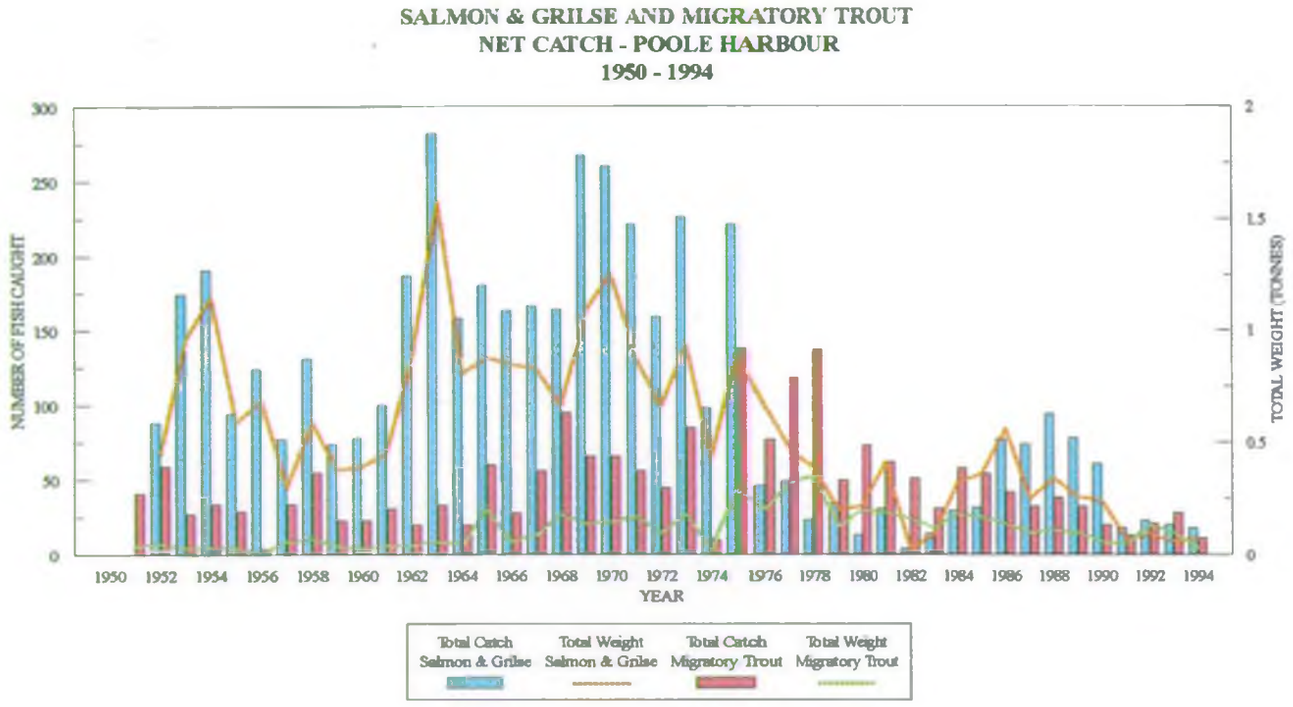
Organford Mill on the Sherford River can be an obstruction to the upstream movement of migratory salmonids under certain flows.

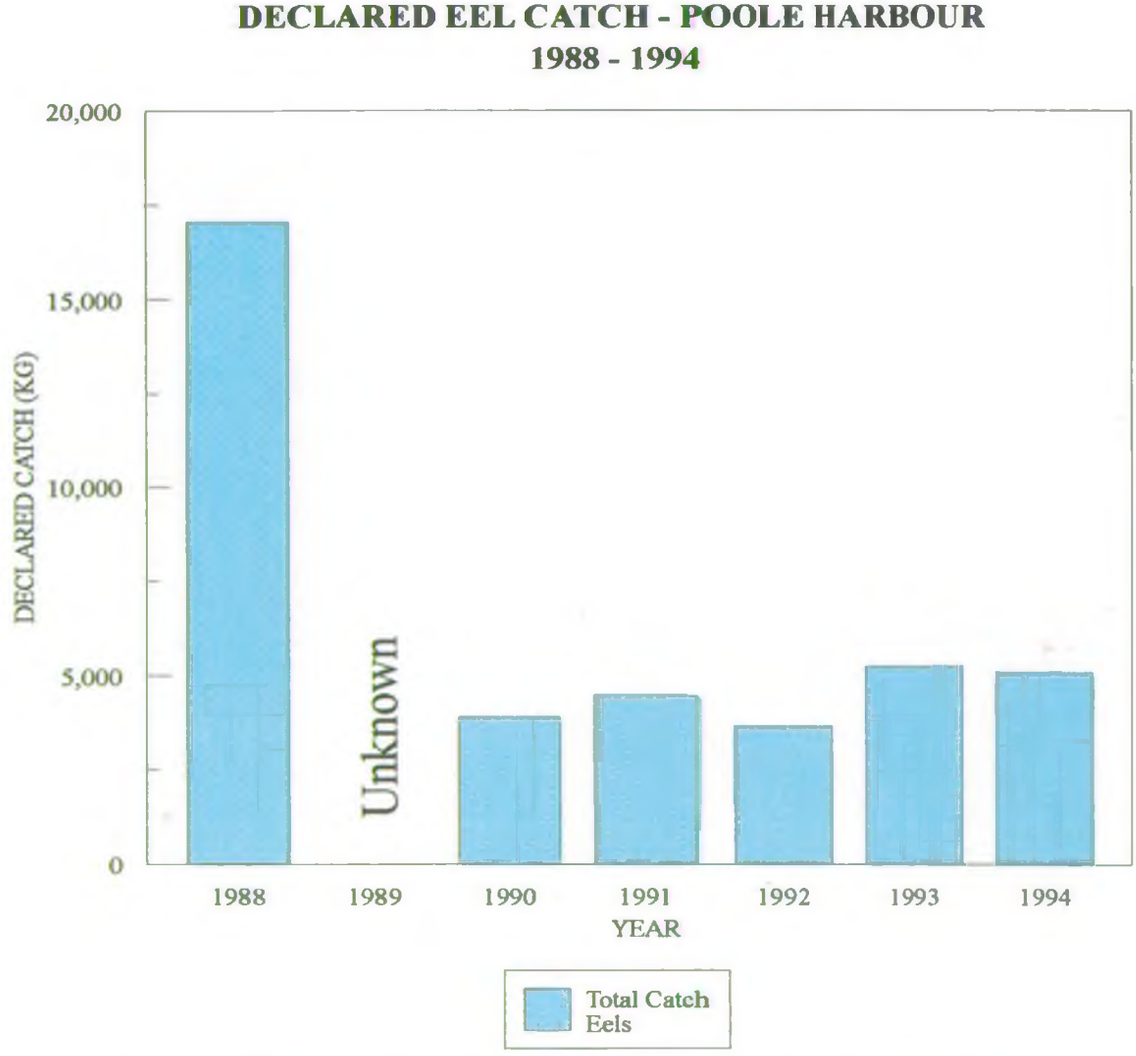
Fish migration can be affected by illegal netting. A Southern Sea Fisheries District Committee byelaw prohibits the use of fixed nets in Poole Harbour between 1 April and 30 September. This byelaw was introduced in 1986 specifically to protect migratory salmonids. Illegal fishing still takes place, largely at night with fixed nets set in the lower reaches of the rivers and the Wareham Channel area.

Ostensibly-legal drift netting in the Wareham Channel, which takes place day and night, is also a threat to migratory salmonids.

The NRA routinely carries out enforcement and anti-poaching work to ensure that fish are not being taken illegally. In tidal waters this is usually done by boat and consolidated by land-based observation, between April and September.

FIGURE 3 : POOLE HARBOUR & PURBECK CATCHMENT - FISHERIES STATISTICS





8.3. Commercial Fishing

Figure 3 shows historical catches of salmon and trout by the licensed netsman since 1950

A licence has only been required for tidal fyke nets for eels since January 1991; in a typical year we issue about 250 licences. At present a rod licence is technically required to take eels in Poole Harbour, but an exclusion from this requirement is being considered for Poole Harbour and some other tidal waters in the area. The declared catch of eels in Poole Harbour since 1988 is given below.

Year	Declared Catch (kg)
1988	17045
1989	Unknown
1990	3909
1991	4474
1992	3663
1993	5240
1994	5094

Issue 18. Licence requirements for eel fishery

Southern Sea Fisheries District Committee are the Sea Fisheries Authority for the catchment. Poole Harbour, west of a line drawn from Jerry's Point through Branksea Castle (eastern end of Brownsea Island) to Salterns Pier, is a bass nursery area.

8.4. Recreation

8.4.1. Poole Harbour

Poole Harbour is subject to tremendous pressures from recreational activities, and the need to address the issue of conflicting uses of the Harbour has been recognised for some time. The recently published Poole Harbour Aquatic Management Plan tackles these issues. This has been produced by the Poole Harbour Commissioners in conjunction with a steering group made up of a large number of key bodies.

A recent report on their consultation process indicated broad support for the strategic aim of the Aquatic Management Plan to promote the sustainable use of Poole Harbour, balancing the demands on its natural resources and resolving conflicts of interest. We were involved with the development of the Aquatic Management Plan and fully support its aims and objectives. For this reason, we do not address further the issue of recreational use of the Harbour.

8.4.2. Bathing Beaches

See Section 5.1.2.

8.4.3. Public Access

A significant part of the 47 mile Purbeck Cycleway is within the catchment area. Although not closely linked to rivers, it provides excellent views of some fine river catchments, and loops through much of Middlebere and Slepe Heath which includes extensive wetland areas.

Mountain biking is extremely popular, even though it is a relatively recent pursuit. There are conflicts with walkers on some routes, and some cannot withstand the erosive pressures of bikes. There may be areas where cycleways could be developed to provide access to riverside land, wetlands or the coast.

Climbing is a significant issue along much of the catchment's coastline. The problem of how to reconcile this largely unobtrusive use of the countryside in which large numbers of people are now involved, with preservation of some of the country's best geological and ecological sites, is demanding attention as interest in the sport increases.

As interest in these and other pursuits increases, management measures such as spatial and/or temporal zoning may need to be considered in certain areas, as has been found necessary in Poole Harbour. Total exclusion may also be appropriate in a limited number of locations.

People with disabilities are often excluded from recreational areas simply because they have not been designed with them in mind. We have a duty to ensure that land under our control is made available for recreational use, and that the needs of persons who are chronically sick or disabled are taken into account. New areas could be opened up for recreational and educational use with access for all in mind, and we will support development that allows public access to all sectors of society.

Erosion by walkers and riders is a major problem within the catchment area. It is perhaps most conspicuous at places such as Lulworth Cove. Any initiative to improve access must consider the damage that people can cause.

Issue 19. Assess the scope for improved public access to the water environment and associated land for informal recreation while minimising detrimental impact

Agricultural land is increasingly being used for other purposes, including recreational facilities, and DCC have stated that there may be a need for a policy to guide such changes. Although we have no direct control over land-use, we will be consulted by the planning authorities on any developments which may affect our interests. We will support developments that improve the wildlife value of farmland and provide opportunities for public access to rivers and wetlands.

Issue 20. Impact of recreational provision on the water environment

8.4.4. Boating

Under the Poole Harbour Commissioner's byelaws there is a requirement not to discharge harmful polluting matter into the Harbour. However few boats have holding facilities for toilet waste, and pumping out facilities are limited. During the summer months, boats are frequently moored close to bathing beaches at Studland and Lulworth, and the discharge of sewage is of concern.

The situation regarding boat use on the tidal Frome has been dealt with in the Frome & Piddle CMP.

Issue 21. The impact of recreational boat use on water quality

8.4.5. NRA Survey and Monitoring Work

The information is mostly gleaned from aerial photo interpretation, as very little survey information is held for the catchment area.

Land drainage consents, abstraction licences, discharge consents and planning applications are screened for their implications for conservation and recreation.

The low-lying area around Poole Harbour

This is an area of great landscape character despite its relative flatness compared with the southern part of the catchment. Its national and international ecological significance is largely due to the presence of lowland heath; a resource that is very rare in Britain and which contributes a distinctive landscape type.

The transitional zone between Poole Harbour and the nearby developed or agricultural land is of crucial ecological importance, including maritime habitats e.g. saltmarsh and wetlands associated with the rivers which feed into the harbour. There are a diverse range of habitats which are dependent upon a suitable water regime, these include carr woodland, Phragmites reedbeds, wet heathland and bog, marshy grassland and associated ditches and drains. Throughout much of this zone, water management is an issue that is crucial to sustaining the ecological interest which could be damaged by intensive management in the future.

Sherford and the lower reaches of the Corfe (downstream of Corfe Castle)

These stretches have the closest link with the Harbour surrounds, and with the relatively flat nature of the latter and the fact that neither could be classed as major rivers, they do not contribute a great deal to the landscape. This is compounded by the fact that neither have significant settlements or roadways close to them. However, the Sherford's contribution is enhanced by its link with several woodland areas, including wet woodlands. Both seem to follow relatively natural courses, although the Sherford has been exploited to create a number of lakes and ponds. The Corfe meanders through a broad open landscape of heathland, wet grassland and associated features.

Corfe (upstream of Corfe Castle)

Upstream of the castle its course is firmly dictated by the chalk ridge to its north, and the Purbeck limestone to the south. Water flows towards the castle gateway from two opposite directions; east and west.

The western arm of the Corfe is the more rural with small-scale meanders containing a wealth of natural features. The corridor has much interest in the form of small wetland patches (mostly in low-lying areas), small pockets of woodland and a fairly continuous ribbon of bank-top trees and shrubs. The surrounding land is dominated by small-to-medium sized semi-regular fields of arable and intensive pasture. Woodlands are in small isolated blocks and unimproved grassland stretches east to west on the higher ground to the north and south.

The Corfe's eastern arm is less rural; otherwise this part of the catchment is broadly similar, although the river itself has suffered more from straightening operations, and consequently its wildlife potential may be reduced.

Swan

Despite abutting the Corfe catchment, and sharing the same restricting east-west ridges to the north and south, the Swan does have a subtly different character. Within the valley, the land is more undulating and the fields slightly smaller and more irregular. They are divided by well-maintained hedges and are interspersed with irregular parcels of deciduous woodland. The small headwaters of the Swan are frequently enclosed with woodland blocks or are tree lined. In the middle reaches the river is dominated by good quality, mixed age deciduous woodland.

The lower reaches have been heavily engineered in the past resulting in straight sections, extensive culverting and a lack of tree, shrub or wetland interest.

Coastal streams

There are a significant number of small streams along the southern coastline; they are all subtly different but share the same basic characteristics of shortness and steepness while providing the only freshwater influence on a strongly coastal terrain. Along most of the coastline, the Purbeck ridge slopes steeply towards the sea with large arable and pasture fields and few hedges or trees. In this context the streams play a significant local landscape role, especially where they run through extensive landslip areas; they often have considerable visual and ecological interest.

Small streams and water bodies in Poole

Within the Poole Borough Council area there are a number of streams and water bodies; many are important in terms of conservation and/or recreation and some carry statutory designations. Their role in landscape terms is important on the local scale, but in the past they may have lacked recognition in terms of their potential visual contribution. Approximately 25% of Poole's green belt is SSSI designated and testifies as to the value of the natural resource surrounding the town.

8.5. Biodiversity

The Government is committed to maintaining and extending biodiversity in the UK. English Nature (EN) will play the lead role in developing species and habitat action plans. When these plans are established we can promote them in our CMPs. The status of aquatic biodiversity in the catchment is not yet defined.

Issue 22. Biodiversity targets need to be set for the catchment

8.6. EC Habitats Directive

This Directive aims to maintain the diversity of European wildlife by protecting vulnerable habitats and the plants and animals that depend upon them. The government has passed regulations which put the requirements of the directive into UK law. The Habitats Directive makes an important contribution to biodiversity through conservation of natural habitats and wild species.

The network of conservation sites set up through Europe will be known as the Natura 2000 series and will consist of Special Areas of Conservation (SACs) and Marine SACs (both set up under the Habitats Directive) and Special Protection Areas (SPAs) set up under the EC Birds Directive. There are 5 proposed SACs and 2 proposed SPAs in this catchment . Final agreement on the list of SACs will not happen until 1998.

We have signed a Memorandum of Understanding with EN on River SSSIs that will also apply to SACs. For each site, a jointly agreed conservation strategy will be produced. A consenting protocol will also be produced which establishes respective responsibilities for activities which require consent by either the NRA or EN. This should clarify procedures for landowners and reduce bureaucracy.

Issue 23. Ensure appropriate management of NRA function in areas designated under EC Habitats Directive

8.7. Coastal Zone Management

The fragmented nature of management in the coastal zone, with many organisations having their own statutory responsibilities, has resulted in confusion over roles and relationships. The need to work together is recognised and a number of initiatives are in hand to facilitate a more coordinated approach to coastal zone management.

Issue 24. Integrated management of the coastal zone.

9. ISSUES AND OPTIONS

Options for Action	Benefits	Constraints	Action by
1. Non-compliance with EC Bathing Waters Directive at Swanage			
Improvements to 16 CSOs on the Swanage sewerage system	Compliance with Directive. Improved water quality	None - funds secured	WWS NRA
2. Non-compliance with EC Bathing Waters Directive at Kimmeridge			
Negotiate with Smedmore Estate to secure improvements	Compliance with Directive. Improved water quality	Cost	NRA Owners
3. Failure to meet copper and zinc standards at some EC designated shellfish waters in Poole Harbour			
Investigate cause of failure	Identify reason for failure Provide data for decision making		NRA
4. Determine whether Poole Harbour is a sensitive area under UWWTD			
Survey underway to collect and analyse chemical and biological data	Improved knowledge for planning Improved environment for Harbour users and wildlife		NRA
5. Establish level of treatment needed at Swanage under UWWTD			
Comprehensive studies undertaken by WWS	Provide data for decision making		WWS
Results audited by NRA			NRA
6. Annex 1A Reduction Programme. Significant levels of nickel and gamma HCH entering Poole Harbour from Poole STW			
Consent conditions to reduce loads of these substances in the discharge	Improved water quality	Cost	NRA WWS
7. Bioaccumulation of metals and organic residues in marine organisms			
Continue Bioaccumulation programme	Up-to-date information. Trends can be monitored	NRA resources	NRA
8. Impact of sea outfalls on marine environment			
Repeat survey of Holes Bay following improvements to Poole STW	Improved knowledge		NRA
Comprehensive studies at Swanage by WWS, audited by NRA	Impact assessment of discharges		WWS NRA
Repeat survey at Lulworth to assess impact of screening			
Annual assessment of outfalls in Poole Harbour and along the coast			
9. Impact of development of water resources at Bulbury and Lytchett			
Test pump analysis to determine yield	Establish reliability of source		WWS NRA
Impact assessment of development of the resource	Protection of the environment		NRA WWS
10. Fully integrated Flood Defence Management Framework			
Implement Flood Defence Management Framework	Target resources to areas of greates need		
11. Improved identification of flood risk areas			
Section 105 surveys, subject to approval, all surface waters to be surveyed by 1999	Updated information on flooding problems. Improved information for LPAs	Cost	NRA LPAs
12. Flood Protection at Town Quay, Poole			
Investigate, justify and implement FAS	Protection of people and property from flooding		NRA Bournemouth BC, PHC
13. Operation of Swanage Flood Alleviation Scheme if adopted by NRA			
Investigate resources required to maintain and operate the flood defences			NRA

Options for Action	Benefits	Constraints	Action by
14. Adequate provision of flood warning in the catchment			
Review flood risk warning areas	Will provide an agreed standard for the provision of flood warning in the catchment		NRA
Review existing provisions of flood warning with respect to Emergency Response Levels of Service			NRA
Recommend improvements and produce a programme of future work and cost implications as appropriate			NRA
15. Operation and manning of Green Gardens FAS			
Review operation and manning requirements			NRA
16. Development of an integrated coastal defence strategy			
Hurst Spit-Durlston Shoreline Management Plan	Determination of sustainable coast defence policy. Assist in preparation of local plans.		Bournemouth BC, NRA, LPAs, DCC, MAFF
Durlston-Portland Shoreline Management Plan			Weymouth & Portland BC, NRA, LPAs, DCC, MAFF
17. Lack of knowledge of populations of non-salmonid migratory fish			
Conduct a survey of the abundance and distribution of shad and smelt	Improved knowledge		NRA
18. Licence requirements for eel fishery			
Implement results of review			NRA
19. Assess scope for improved public access			
Examine scope for increased access especially for disabled/educational use	Increasing peoples awareness and enjoyment of rivers and coastal waters		NRA LPAs Owners
Collaborate with Poole Harbour Steering Group to ensure that access is compatible with the Aquatic Management Plan			NRA PHSC
20. Impact of recreational provision on the water environment			
Provide advice and guidance to LPAs on the impact of proposed recreational development on the water environment			NRA LPAs
21. Impact of recreational boat use on water quality			
Investigate impact on water quality	Improved knowledge provides data for decision making		NRA PHC
22. Biodiversity targets for the catchment			
Encourage and cooperate with the setting of standards for wetland habitat and species conservation based on the recommendations of the UK Biodiversity Action Plan and other initiatives	Provide a basis for maintaining abundance and diversity of wildlife		EN NRA
23. Impact of EC Habitats Directive on Functions of the NRA			
Conservation strategy produced for designated sites	Clearly understood roles and responsibilities		EN NRA
Agreed consenting protocol for designate sites	Clear guidance to landowners		EN NRA

Options for Action	Benefits	Constraints	Action by
24. Integrated management of the coastal zone			
Participate fully in Dorset Coast Forum, and work with others towards agreed integrated coastal management policy	Effective management of the environment		DCC, DCs, MAFF, Environment organisations Local busines
Participate fully in Poole Harbour Steering Group	Effective management of Poole Harbour		PHC, DCs, NRA, EN, SSFDC, RSPB
Support Poole Harbour Aquatic Management Plan	Effective management of Poole Harbour		PHC, DCs, NRA, EN, SSFDC, RSPB
Contribute to production of Shoreline Management Plans	Integrated coastal defence strategy		Bournemouth BC, Weymouth & Portland BC, DCs, NRA, MAFF, Environment organisations etc

APPENDICES

10. APPENDICES

10.1 References

Admiralty Tide Tables 1995

AMP2 Guidelines, Version 2, Approved by the Quadripartite Meeting (1993)

Ancient Monuments and Archaeological Areas Act 1979

Broadstone Creekmoor Local Plan, Adopted (1987) Poole Borough Council

Coast Protection Act 1949

Code of Good Agricultural Practice for the Protection of Soil (1993) MAFF & Welsh Office

Code of Good Agricultural Practice for the Protection of Water (1991) MAFF & Welsh Office

Corfe Mullen Local Plan, Adopted East Dorset District Council

Development and Flood Risk 1992 Joint Circular 30/92, DoE, MAFF and Welsh Office

Dorset (Excluding South East) Structure Plan : First and Second Alterations Dorset County Council

Dorset County Structure Plan, Consultation Draft (1994) Dorset County Council

Dorset Minerals and Waste Local Plan, Deposit Plan (1994) Dorset County Council

Dorset County Landscape Assessment : Landscape Character (1993) Countryside Commission

EC Directive on Species and Habitats (92/43/EEC)

EC Directive on the Conservation of Wild Birds (79/409/EC)

EC Directive on Freshwater Fish (78/659/EEC)

EC Directive on Pollution Caused by the Discharge of Certain Dangerous Substances into the Aquatic Environment (76/464/EEC)

EC Directive Concerning the Quality of Bathing Water (76/160/EEC)

EC Directive Laying Down the Health Conditions for the Production and Placing on the Market of Live Bivalve Molluscs (91/492/EC)

EC Directive Concerning Urban Waste Water Treatment (91/271/EEC)

EC Directive on the Quality Required of Shellfish Waters (79/923/EEC)

Endangered Wildlife in Dorset - The County Red Data Book (1993) Dorset Environmental Records Centre

Forests and Water Guidelines, Third Edition (1993) The Forestry Authority, HMSO

Guidance Notes for Local Planning Authorities on the Methods of Protecting the Water Environment through Development Plans (1994) NRA

Isle of Purbeck Local Plan, Adopted (1991) Purbeck District Council

Keep Purbeck Special - A Strategy for the Purbeck Heritage Area (1995) Purbeck Heritage Committee

Lytchett Matravers Local Plan, Adopted Purbeck District Council

British Red Data Books Joint Nature Conservation Committee

North East Purbeck Local Plan, Deposit Plan (1991) Purbeck District Council

Planning and Compensation Act 1991 HMSO

Policy and Practice for the Protection of Groundwater (1992) NRA

Poole Coastal Local Plan, Adopted (1992) Poole Borough Council

Poole Harbour Acts and Orders 1756 - 1981

Poole Town Centre Local Plan, Adopted (1987) Poole Borough Council

Poole Fishery Order 1985

Poole Harbour Aquatic Management Plan (1995) Poole Harbour Steering Group

APPENDICES

Purbeck Deposit Plan (Available 1996) Purbeck District Council

Sandford and Northern Wareham Local Plan, Adopted Purbeck District Council

South Western Region Water Resources Development Strategy - Tomorrow's Water (1995) NRA

South East Dorset Structure Plan : First and Second Alterations Dorset County Council

Study of Algal Growth in Poole Harbour with Reference to the Urban Waste Water Treatment Directive 91/271/EEC, Internal NRA Report (1993) Perkins M

Sustainable Development - The UK Strategy (1994) HMSO

The Dorset Coast Today (1994) Dorset County Council

The Effects of Effluent from Poole Sewage Treatment Works upon the Intertidal Macrofauna of Holes Bay, Poole Harbour (1991) White S J

The Frome & Piddle Catchment Management Plan Consultation Report (1995) NRA

Tidal Sea Defence Survey - Poole and Purbeck (1991)

Town and Country Planning (Development Plans) Regulations 1991

Water Quality Objectives : Procedures used by the NRA for the purpose of the Surface Waters (Rivers Ecosystem) (Classification) Regulations 1994 NRA

Water Act 1973 HMSO

Water Act 1989 HMSO

Water Resources Act 1991 HMSO

Wildlife and Countryside Act 1981 HMSO

10.2 Poole Harbour Steering Group - Organisations With Statutory Responsibilities Within Poole Harbour

Dorset County Council is the strategic planning and highway authority for the county and is also the agency responsible for management of the Purbeck Heritage Coast, which the southern shore of the Harbour is part.

Poole Borough Council is the local planning and environmental health agency for the northern part of the Harbour. Poole Borough Council, with representation from Purbeck District Council, also acts as the Port Health Authority for the entire Harbour.

Purbeck District Council is the local planning and environmental health agency for the southern part of the Harbour.

Poole Borough and **Purbeck District Council** are also the Coast Protection Authorities for the Harbour under the Coast Protection Act, 1949.

Poole Harbour Commissioners are the competent Harbour Authority for the Area, exercising navigational control of the water area up to the line of mean High Water of ordinary tides under the Poole Harbour Acts and Orders of 1756 to 1981. They are the owners and operators of the port and have powers to create Byelaws and issue licences which control activities on the water and permit works and moorings within the Harbour limits.

English Nature is the statutory agency responsible for the Harbour's SSSIs notified under the Wildlife and Countryside Act 1981. Any development or operation specified as potentially damaging to the area concerned must receive their prior consent unless it is covered by the provisions of that Act or a management agreement.

Southern Sea Fisheries District Committee is the statutory authority responsible for the administration and management of fisheries in Poole Harbour and on the coast. The SSFDC derives its powers from the Poole Fishery Order, 1985, and has the right of regulating a fishery for oysters, mussels, cockles and clams. The committee has powers to grant leases, impose restrictions and change fees for licenses and leased areas within the fishery.

10.3 Conservation Designations In The Poole Harbour & Purbeck Catchment

Sites Of Special Scientific Interest					
1. Townsend (14.2)	2. Belle Vue Quarry (3.2)	3. Black Hill (69.7)	4. Purbeck Ridge (West) (146.1)	5. East Coppice (4.8)	
Sites Of Special Scientific Interest With Geological Interest					
1. Purbeck Ridge (East) (142.0)	2.Blashenwell Farm Pit (11.4)				
Sites Of Special Scientific Interest With Wetland & Geological Interest					
1. South Dorset Coast (1760.9)	2. Ham Common (32.0)				
Sites Of Special Scientific Interest With Wetland Interest					
1. Studland & Godlingston Heath (758.9)	2. Canford Heath (413.3)	3. Brenscombe Heath (34.7)	4. Rempstone Heath (174.8)	5. Poole Harbour (4049.0)	6. Upton Heath (215.8)
7. Thrashers Heath (13.1)	8. Arne (563.4)	9. Corfe Mullen Pastures (11.64)	10. Corfe Common (-)	11. Corfe Meadows (24.1)	12. Norden (11.8)
13. Hartland Moor (299.9)	14. Holton Heath (164.3)	15. Blue Pool & Norden Heath (91.6)	16. Stoborough & Creech Heaths (339.9)	17. The Moors (156.8)	18. Sandford Heath (49.9)
19. Gore Heath (87.6)	20. Morden Bog (212.7)				
Sites Of Nature Conservation Interest With Wetland Interest					
1. Old Wood & Meadows	2. Hatch Road	3. Harkwood Saltmarsh	4. Withy Bed, Bushey	5. Poor Common Heaths	6. Dyett's Meadow
7. Sandford	8. Snails Bridge	9. Oak Hill			
Sites Of Nature Conservation Interest					
1. Sandbanks	2. Luscombe Valley	3. Canford Heath	4. Studland Hill	5. California Farm	6. Herston
7. Phillip's Coppice	8. Alderbury	9. Godlingston Wood	10. Dyett's Meadow	11. Greenland	12. Worburton Road
13. Marsh Copse	14. Holes Bay Relief Road	15. Pocket Park	16. Broadstone Recreation Ground	17. Yards Brake	18. Rempstone / Kings Wood
19. Quince Hill	20. Fitzworth Point	21. Brook's Pit	22. Horn Hill Copse & Cutting	23. Talbot's Wood	24. Ailwood Down
25. Langton West Wood	26. The Wilderness	27. Higher & Lower Grove Wood	28. Downshay Field	29. Downshay Wood Woodland	30. Tabbits Hill
31. Brenscombe Wood	32. Purbeck Forest Track	33. Challow & Rollington Hill	34. Ashley Copse	35. Heathland Restoration Field	36. Woolgarston Copse
37. Corfe Castle	38. Knowle & West Hill	39. Huntick farm	40. Elder Moor	41. Ridgeway Hill	42. Bulbury Coppice
43. Phillip's Coppice	44. Bloxworth & Morden Heath	45. Rough Bulbury	46. Little Old Park Coppice	47. Egilston Gwyle	48. West Creech
49. Fry's Wood	50. Broad Breach	51. Brimland Wood	52. Waterley Road		
National Nature Reserves					
1. Studland Heath	2. Hartland Moor	3. Arne Reedbeds	4. Holton Heath	5. Morden Bog	
Local Nature Reserves					
1. Townsea & Swanage Quarries	2. Brownsea Island	3. Bat Quarries	4. Kilwood	5. Woolsbarrow	6. Purbeck Marine Reserve

Numbers relate to those on Map 8. Areas of SSSIs Shown In Brackets - hectares

10.4 EC Directive On The Quality Of Freshwaters Needing Protecting Or Improvement In Order To Support Fish Life (78/659/EEC)

Determinand		Salmonid Waters		Cyprinid Waters	
Guideline or Indicative Standards		G	I	G	I
Dissolved Oxygen as mg/l O_2		100% > 7	50% > 9	100% > 5	50% > 7
pH as pH units		-	6.0-9.0	-	6.0-9.0
Suspended Solids at mg/l		25	-	25	-
BOD (Total) as mg/l O_2		5	-	8	-
Nitrite as mg/l N		0.150	-	0.460	-
Non-ionised Ammonia as mg/l N		0.004	0.021	0.004	0.021
Ammonia (Total) as mg/l N		0.030	0.780	0.160	0.780
Total Residual Chlorine as mg/l HOCl		-	0.005	-	0.005
Zinc (Total) as mg/l Zn	Hardness (mg/l $CaCO_3$)				
	0-50	-	0.03	-	0.30
	50-100	-	0.20	-	0.70
	100-250	-	0.30	-	1.00
	>250	-	0.50	-	2.00
Copper (Dissolved) as mg/l Cu	Hardness (mg/l $CaCO_3$)				
	0-50	0.005	-	0.005	-
	50-100	0.022	-	0.022	-
	100-250	0.040	-	0.040	-
	>250	0.112	-	0.112	-

For dissolved oxygen, 50% median and 100% minimum standard.
For suspended solids, the 'G' value is an annual average concentration.

10.5 EC Directive Concerning The Quality Of Bathing Waters (76/160/EEC)

Microbiological Standards

Parameter	Units	Value		Status	
Imperative or Guideline Standards		I	G	I	G
Total coliforms	no/100ml	10,000	500	95% of samples	80% of samples
Faecal coliforms	no/100ml	2,000	100	95% of samples	80% of samples
Faecal streptococci	no/100ml	-	100	-	80% of samples
Salmonella	no/l	0	-	95% of samples	-
Enterovirus	PFU/10l	0	-	95% of samples	-

PFU = Plaque Forming Units

There is currently no imperative standard for faecal streptococci, however, it has been proposed that the Directive should be revised and should include an imperative standard for faecal streptococci of 400/100ml.

Aesthetic Criteria

Parameter	Analysis Method	Description/Standard
Colour	Visual inspection	No abnormal change
Mineral oils	Visual inspection	No visible surface film
	Olfactory inspection	No odour
	mg/l after extraction and weighing dried residue	≤0.3
Surface-active substances (methylene-blue active)	Visual inspection	No lasting foam
	mg/l as lauryl sulphate	≤0.3
Phenols	Olfactory inspection	No specific odour
	mg/l	≤0.05
Transparency	m	1
Tarry residues, solid floating material, effluent slicks	Visual inspection	Absent

10.6 EC Dangerous Substances Directive On Pollution Caused By Certain Substances Discharged In The Aquatic Environment Of The Community (76/464/EC)

EQSs For List I Substances (Tidal Waters)

Parameter	Units	Value	Status (1)
Mercury (2)	µg Hg/l	0.3	AA,D
Cadmium (2)	µg Cd/l	2.5	AA,D
Hexachlorocyclohexane (HCH) (2)	µg/l	0.02	AA,T
Tetrachloromethane (CTC)	µg/l	12	AA
DDT (para-para DDT isomer) (2)	µg/l	0.01	AA
Total DDT (2)	µg/l	0.025	AA
Pentachlorophenol (PCP) (2)	µg/l	2	AA
'The Drins' (from 1 Jan 1989)	µg/l	0.03 (3)	AA,T
Aldrin (from 1 Jan 1994)	µg/l	0.01	AA
Dieldrin (from 1 Jan 1994)	µg/l	0.01	AA
Endrin (from 1 Jan 1994)	µg/l	0.005	AA
Isodrin (from 1 Jan 1994)	µg/l	0.005	AA
Hexachlorobenzene (HCB) (2)	µg/l	0.03	AA
Hexachlorobutadiene (HCBD) (2)	µg/l	0.1	AA
Chloroform	µg/l	12	AA
1,2-dichloroethane	µg/l	10	AA
Trichloroethylene	µg/l	10	AA
Perchloroethylene	µg/l	10	AA
Trichlorobenzene(TCB)	µg/l	0.4	AA

Proposals have been published for the following List I substances but these have not, so far, been adopted : trifluralin, endosulphan, simazine, triorganotin compounds (tributyltin oxide, triphenyltin acetate, triphenyltin oxide, triphenyltin hydroxide), atrazine, organophosphorus substances (azinphos-methyl, azinphos-ethyl, fenitrothion, fenthion, malathion, parathion and parathion-methyl, dichlorvos).

(1) AA=Annual Average, T=Total, B=Background Monitoring

(2) A `standstill' provision exists for concentrations in sediments and/or shellfish and/or fish

(3) Maximum of 0.005 for Endrin

(4) B=Background Monitoring : only applies at designated end of catchment sites

EQSs For List II Substances (Tidal Waters)

Parameter	Units	Value (1)	Status
Lead	µg Pb/l	25	AA,D
Chromium	µg Cr/l	15	AA,D
Zinc	µg Zn/l	40	AA,D
Copper	µg Cu/l	5	AA,D
Nickel	µg Ni/l	30	AA,D
Arsenic	µg As/l	25	AA,D
Boron	µg B/l	7000	AA,D
Iron	µg Fe/l	1000	AA,D
pH	pH	6 to 8.5 (3)	95% of samples
Vanadium	µg V/l	100	AA,T
Tributyltin	µg/l	0.002	M,T
Triphenyltin	µg/l	0.008	M,T
Polychlorochlormethyl- sulphonamidodiphenyl ether (PCSDs)	µg/l	0.05	T, 95% of samples
Sulcofuron	µg/l	25	T, 95% of samples
Flucofuron	µg/l	1.0	T, 95% of samples
Permethrin	µg/l	0.01	T, 95% of samples
Cyfluthrin	µg/l	0.001	T, 95% of samples

(1) National environmental quality standards recommended for the UK.

(2) AA=Annual Average; D=Dissolved; T=Total; M=Maximum Allowable Concentration

(3) A Std denotes standards for the protection of sensitive aquatic life
B Std denotes standards for the protection of other aquatic life

10.7 EC Directive On The Quality Required Of Shellfish Waters : Environmental Quality Standards And Minimum Sampling Frequencies (79/923/EEC)

Parameter	Minimum Sampling Frequency per annum	Mandatory Standard
pH	4	7 - 9
Temperature	4	No mandatory standard≤
Colour	4	Deviation from 'normal' must not be >10 mgPt/l
Suspended Solids	4	Deviation from 'normal' must not be >30%
Salinity	12	≤40% Deviation from 'normal' must not be >40%
Dissolved Oxygen	12	>70% (annual average) Not <60% unless no adverse effects
Hydrocarbons	4	No visible film. No adverse effects
Lindane	2	100
Dieldrin	2	100
DDT	2	33
Parathion	2	100
Silver	2	10
Arsenic	2	3000
Cadmium	2	330
Chromium	2	1000
Copper	2	10
Mercury	2	1
Nickel	2	100
Lead	2	100
Zinc	2	40

i) Standards for dissolved metals and organohalogenated substances and parathion are given in µg/l.

ii) 100% of samples for the parameters organohalogenated substances, parathion and metals; 95% of the samples for the parameters salinity and dissolved oxygen; and 75% of the samples for the other parameters listed in Table 2 must meet the above standards.

iii) Reduced sampling frequency may be applied where water quality has been demonstrated to consistently exceed the required standards and it is believed no deterioration of water quality can have occurred.

10.8 EC Directives Concerning Urban Wastewater Treatment (91/271/EEC) And Concerning The Protection Of Waters Against Pollution Caused By Nitrates From Agricultural Sources (91/676/EEC)

Tidal Waters - Indicative Standards for the identification of Sensitive Waters (Eutrophic) and Polluted Waters (Eutrophic)

Determinand	Indicative Standard		Notes
	Estuaries	Coastal Waters	
Nitrate			
(mg N/l)	>0.21	>0.21	Winter concentrations
Phosphorus			
(µg P/l)	>6.2	>6.2	DAIP1; Winter concentrations
Chlorophyll a			
(µg/l)	>10	>10	
Algal Bloom Cell Density (cells/l)	$>5x10^5$	$>5x10^5$	
Dissolved Oxygen	Daytime O_2 depletion	-	Linked to algal decay NOT organic inputs from discharges
Effects on fauna	Invertebrate, shellfish, fish mortalities		NOT associated with organic pollution
Effects on macroalgae	>10 hectares (>25% of available intertidal area) in which algal cover exceeds 25%		Especially Enteromorpha and Ulva
Effects on microalgae	Presence of significant blooms leading to accumulation of scum/foam on beaches; public complaints/concern		
Estuary Flushing Times (weeks)	>1 to 2	-	

Notes : 1 DAIP Dissolved available inorganic phosphorous

The assessment of whether a stretch of water is actually or potentially eutrophic is not possible simply by reference to numeric chemical criteria, however, they do provide an indication of symptoms, and the importance of each of the criteria should be assessed on a local basis.

Indicative Standards For identifying HNDAs, and defining *no adverse affects*[1]

Any site designated as an HNDA must be subject to Comprehensive Studies to be carried out by the discharger, and audited by the NRA, before a consent can be issued for a lower level of treatment. The comprehensive studies must show that no adverse effects will be caused by discharging a primary rather than a secondary treated effluent within the HNDA. In addition, protection of Bathing Waters and other recognised uses must be considered separately within the scheme design.

Determinand	Indicative Standard		Notes
	Estuaries[2]	Coastal Waters	
Minimum Initial Dilution	50	50	Dependant of location of discharge
Dissolved oxygen : change caused by discharge (mg/l)	≤1	≤0.5	Based on a predicted median DO of 7mg/l
BOD : deviation from background (mg/l)	-	<1.5	
Area must not be eutrophic	-	<1µg/l of chlorophyll ascribed to discharge	
Marine Communities	-	No change >100m from outlet	

1 Comprehensive Studies for the purposes of Article 6 of Directive 91/271/EEC. The Urban Waste Water Treatment Directive. Marine Pollution Monitoring Management Group, February 1994.

2 The difference in loading from a primary treated effluent compared to a secondary treated effluent from works in the range 2000 to 10000 pe is very small. Therefore only DO is likely to be significantly affected. Therefore this is the main criterion for assessing *no adverse affect* in estuaries.

10.9 EC Directive Laying Down The Health Conditions For The Production And Placing On The Market Of Live Bivalve Molluscs (91/492/EC)

End Product Standard

- Must be fresh and alive (response to percussion)
- must contain <300 faecal coliforms or <230 E.coli per 100g shellfish flesh
- no salmonella in 25g of flesh
- no toxic or objectionable compounds such as those listed in Directive 79/923/EEC
- Paralytic Shellfish Poison must not exceed 80 µg per 100g of flesh
- Diarrhetic Shellfish Poison must not exceed 'dangerous levels'
- provision for a future virological standard
- provision for revision of bacteriological standard

Classification Of Harvesting Areas

Category A	<230 E.coli/100g <300 faecal coliforms/100g	flesh may go for direct human consumption
Category B	<4600 E.coli/100g <6000 faecal coliforms/100g (in 90% of samples)	must be depurated, heat treated or relaid to meet category A
Category C	<60,000 faecal coliforms/100g	must be relaid for long periods (2 months) to meet Category A or B (may also be heat treated by approved method)
Category D	above 60,000 faecal coliforms/100g or at discretion of Member State	Prohibited

10.10 3rd North Sea Conference - Priority Hazardous Substances (Annex 1A List Of Substances)

Mercury	DDT	Fenitrothion
Cadmium	Pentachlorophenol	Fenthion
Copper	Hexachlorobenzene	Malathion
Zinc	Hexachlorobutadiene	Parathion
Lead	Carbon tetrachloride	Parathion-methyl
Arsenic	Chloroform	Dichlorvos
Chromium	Endosulphan	Trichloroethylene
Nickel	Trifluralin	Tetrachloroethylene
Aldrin	Simazine	1,1,1-trichloroethane
Dieldrin	Atrazine	Trichlorobenzene
Endrin	Triorganotin compounds	1,2-dichloroethane
Isodrin	Azinphos-ethyl	Polychlorinated biphenyls
HCH	Azinphos-methyl	Dioxins (*)

At the 3rd North Sea Conference, the UK Government undertook to reduce loadings (flow x concentration) of the 'Annex 1A' list of substances except dioxins (*) entering UK tidal waters from rivers and direct discharges by 50% (70% for Hg, Cd, Pb) by 1995, against a 1985 baseline.

10.11 Standards For The Five River Ecosystem Use Classes

Use Class	DO % sat 10%ile	BOD (ATU) mg/l 90%ile	Total Ammonia mgN/l 95%ile	Un-ionised Ammonia mgN/l 95%ile	pH 5%ile & 95%ile	Hardness mg/l $CaCO_3$	Dissolved Copper µg/l 95%ile	Total Zinc µg/l 95%ile	Class Description
1	80	2.5	0.25	0.021	6.0 - 9.0	≤10 >10 and ≤50 >50 and ≤100 >100	5 22 40 112	30 200 300 500	Water of very good quality suitable for all fish species
2	70	4.0	0.6	0.021	6.0 - 9.0	≤10 >10 and ≤50 >50 and ≤100 >100	5 22 40 112	30 200 300 500	Water of good quality suitable for all fish species
3	60	6.0	1.3	0.021	6.0 - 9.0	≤10 >10 and ≤50 >50 and ≤100 >100	5 22 40 112	300 700 1000 2000	Water of fair quality suitable for high class coarse fish populations
4	50	8.0	2.5		6.0 - 9.0	≤10 >10 and ≤50 >50 and ≤100 >100	5 22 40 112	300 700 1000 2000	Water of fair quality suitable for coarse fish populations
5	20	15.0	9.0						Water of poor quality which is likely to limit coarse fish populations

10.12 Glossary Of Terms

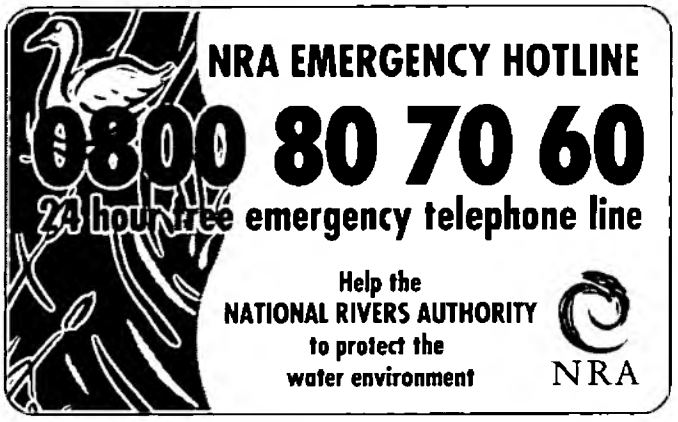
AMP	Asset Management Plan
Anadromous	Fish which live in the sea but enter rivers to breed
AONB	Area of Outstanding Natural Beauty, designated by the Countryside Commission to conserve and enhance the natural beauty of the landscape, mainly through planning controls
Aquifer	A layer of water-bearing rock
BC	Borough Council
BMWP	Biological Monitoring Working Party
BOD	Biochemical Oxygen Demand
BOD (ATU)	Biochemical Oxygen Demand with nitrification suppressed by allylthiourea
BP	British Petroleum
BR	British Rail
CDP	Catchment Drainage Plan
CMP	Catchment Management Plan
CSO	Combined Sewer Overflow
Cyprinids	All non-salmonid freshwater fish
DC	District Council
DCC	Dorset County Council
DO	Dissolved Oxygen
DoE	Department of the Environment
DoH	Department of Health
DoT	Department of Transport
DWF	Dry Weather Flow
DWLP	District Wide Local Plan
DWT	Dorset Wildlife Trust
EC	European Community
ECC	English China Clays
EDDC	East Dorset District Council
EN	English Nature
Eocene	Geologic time period
EQO	Environmental Quality Objective
EQS	Environmental Quality Standard
ERLOS	Emergency Response Levels of Service
EU	European Union
FAS	Flood Alleviation Scheme
FDMF	Flood Defence Management Framework
GQA	General Quality Assessment
HE	House Equivalents per kilometre
HMIP	Her Majesty's Inspectorate of Pollution, the regulatory authority for IPC
HMSO	Her Majesty's Stationery Office
HNDA	High Natural Dispersion Area
HQ	Headquarters
IPC	Integrated Pollution Control, a system introduced to control pollution from industrial processes which could cause significant pollution to air, land and water
LPA	Local Planning Authority
LPG	Liquified Petroleum Gas
LTA	Long Term Average
mAOD	metres Above Ordnance Datum
MAFF	Ministry of Agricultural Food and Fisheries
MoD	Ministry of Defence
MPCU	Marine Pollution Control Unit
NDDC	North Dorset District Council
Neap tide	Tide where there is least difference between high and low water
NNR	National Nature Reserve, a site owned or leased and managed by English Nature and established as a reserve
NRA	National Rivers Authority

NWC	National Water Council
OFWAT	Office of Water Services, the government regulatory agency for the water industry
PCB	Poly Chlorinated Biphenols
PHC	Poole Harbour Commissioners
PHSC	Poole Harbour Steering Group
PPPG	Policy and Practice for the Protection of Groundwater
PWS	Public Water Supply
R&D	Research and development
RAMSAR Sites	Sites identified by UK Government under the Convention on Wetlands of International Importance which was ratified by the UK Government in 1976
RE	River Ecosystem
RIVPACS	River Invertebrate Prediction And Classification System, a computer program developed by IFE which predicts the most likely invertebrate fauna of a river from a selection of simple physical and chemical measurements
RQO	River Quality Objective
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
Salmonids	Salmon, Brown and Sea Trout and Rainbow Trout
SAM	Scheduled Ancient Monument of national importance designated under the Ancient Monuments and Archaeological Areas Act 1979
SMA	Sensitive Marine Area
SNCI	Site of Nature Conservation Interest selected (usually by County Trusts) as sites of County ecological importance
SoS	Standard of Service
SPA	Special Protection Areas identified by UK Government under the EC Directive on the Conservation of Wild Birds (79/409/EC)
Spring tide	Tide where there is the greatest difference between high and low water
SSFDC	Southern Sea Fisheries District Committee
SSSI	Site of Special Scientific Interest of national importance designated under the Wildlife and Countryside Act 1981. Habitats, sites for individual species, geology and land forms may be designated
STW	Sewage Treatment Works
Tertiary	Geologic time period
Triassic	Geologic time period
UKAEA	United Kingdom Atomic Energy Authority
UNESCO	United Nations Educational, Scientific, and Cultural Organisation
UWWTD	Urban Waste Water Treatment Directive, an EC Directive
W & P BC	Weymouth & Portland Borough Council
WDDC	West Dorset District Council
WRA	Waste Regulation Authority
WWS	Wessex Water Services Ltd

10.13 Units

m^3/s	cubic metres per second (cumecs)
m^3/d	cubic metres per day
l/s	litres per second
Ml/d	megalitres per day
Ml/y	megalitres per year
Mgd	millions of gallons per day
mg/l	milligrams per litre
µg/l	micrograms per litre
ng/l	nanograms per litre

Telephone the emergency hotline to report all environmental incidents, such as pollution, poaching and flooding, or any signs of damage or danger to our rivers, lakes and coastal waters. Your prompt action will help the NRA to protect water, wildlife, people and property.



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