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# Water Resources in England and Wales Early Prospects for 2004

February 2004



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AGENCY

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# Summary

Across England and Wales, 2003 was one of the driest years on record. As the dry weather continued late into the autumn, concerns about water supply increased in many areas and the Environment Agency and water companies brought their drought plans into action.

Reservoirs in many parts of England and Wales were at extremely low levels by the end of October and water companies took action to conserve supplies. These included publicity campaigns to seek water saving by the public, enhanced leakage control, applications for drought permits and a drought order and operational changes to promote reservoir refill.

Rainfall in November, December and January has improved the situation significantly and most reservoirs are either full or filling rapidly. However, the dry autumn means that there has so far been little groundwater recharge. More recently groundwater levels have started to recover and **average or close to average** rainfall for the rest of the winter and early spring would minimise, though not remove entirely, problems for the summer of 2004.

If rainfall over the rest of the winter and the early spring is **below average**, there could be particular water supply problems in south-east England and some difficulties in parts of south-west England during the summer and autumn, due to low groundwater levels. All of the water companies in this area are aware of this possibility and are working with the Agency to make best use of the resources available to them. With low rainfall over this period we would expect to see major publicity campaigns seeking reductions in water use, hosepipe bans, and further drought permit and drought order applications. If a dry autumn were to follow problems would continue during the summer of 2005.

Throughout the rest of England and Wales the risk of water supply problems in the summer of 2004 is no higher than normal. However, a dry spring and autumn could lead to problems for the summer of 2005 in East Anglia, the Thames basin and parts of south-west England in addition to the south-east.

Low rainfall over the next few months would lead to low groundwater levels in southern, eastern and north-eastern England which may also present problems for other abstractors. Shallow boreholes may be unreliable if groundwater levels are particularly low in the summer and autumn of 2004. However, with low rainfall over the spring, conditions are likely to be similar to those experienced in 1995 and boreholes that proved reliable in 1995 should continue to provide adequate water in 2004. Exceptionally low groundwater levels and associated river flows may make it necessary for the Environment Agency to restrict spray irrigation in some catchments.

Where our wetlands, wildlife habitats and rivers are dependent on groundwater levels and spring flow, they are adapted to the natural variability of the hydrological cycle. Low rainfall over the next few months may mean that resulting low groundwater levels will put these sites under some stress. The Environment Agency will monitor the effects of drought on wildlife and plants and take action to mitigate serious impacts where possible. Where impacts are as a result of the use of any additional drought powers we will work with other parties to agree mitigation and in the case of Natura 2000 sites and SSSIs to ensure that these sites are not adversely affected.

In summary, rainfall over the last three months has improved prospects for all water companies. The possibility of a shortage of water next summer depends on the rainfall we receive in the next few months and average rainfall would resolve most of our concerns. Dry weather, however, may lead to problems in south-east England and actions to secure supplies over the summer months therefore becoming necessary including hosepipe bans, drought permits and drought orders. The Agency will be taking stock regularly and particularly at the end of the groundwater recharge period in the spring.

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# 1 Introduction

In England and Wales the summer and early autumn of 2003 were unusually dry. The fine, settled weather gave us a prolonged and colourful autumn, but also led to some problems. Some farmers could not harvest root crops from the dry soil, and autumn-planted crops failed to establish. As the dry weather continued, there was increased concern about reservoir levels and the possibility of water shortages in some areas during 2004.

Water is a natural, reusable resource. We are fortunate that in most years there is plenty of water to serve the needs of people and the environment. However, during times of drought, careful management is needed to ensure that best use is made of this precious resource.

The Environment Agency is the public body with responsibility for the long-term management of water resources. With a few exceptions, anyone who wishes to take water from the environment in England and Wales needs an abstraction licence from the Agency. Abstraction is subject to conditions that protect the environment from damage and safeguard the rights of other abstractors. The Environment Agency has drought plans that set out the actions that it will take during a drought.

All of the water companies of England and Wales also have their own drought plans. These show how each company intends to manage its resources during a drought. Each plan describes the company's management structure during a drought and identifies the different actions that the company will take as a drought becomes more severe. These include, for example, appeals for reductions in water use, the imposition of hosepipe bans, and applications for drought permits or orders that allow additional water to be abstracted. The Environment Agency reviewed water companies' drought plans and reported on them to Ministers in June 2003.

This report provides the Environment Agency's considered view on prospects for water resources for 2004 and identifies the actions that we believe will be necessary to ensure that the impact of drought is minimised. We start with a brief review of the current situation before looking at prospects for public water supply, other water users and the environment.

Much of the information that we have used in preparing this report has come from the water companies of England and Wales. We are grateful for the help and co-operation of the water companies and other organisations of England and Wales.

It is important to note that this report is being prepared in the early part of the winter. Long-term weather forecasts are not sufficiently reliable to give a clear view of the likely state of water resources at the end of the spring. Therefore this report can provide only an indication of the areas where particularly careful management will be necessary to ensure that adequate water supplies can be made available in a way that does not damage the environment. We also identify the actions that will need to be taken in these areas. Some of these may turn out to be unnecessary. However, it is better to take precautionary action now than to suffer unnecessary water shortages later in the year.

## 2 Current situation

This part of the report looks at the current situation. First we consider the rainfall of 2003 and look at how this has led to the current resource position. Next we look at the drought management actions that have been taken by water companies and the Environment Agency. We then look at impacts on other users in 2003. Finally we consider the condition of resources in January 2004.

### 2.1 Rainfall and resources in 2003

For England and Wales, 2003 was one of the driest years in the recent record; it was the third driest since 1961 with only 1964 and 1973 recorded as drier. The period from January to October was exceptional, as it was the driest January to October period since 1959. Seven of the first ten months of 2003 saw less than average rainfall (see figure 1 below) and rainfall in August to October was only 51 per cent of the long-term average for those months.

The lack of rainfall was noticed first in the south of England but then by the end of October, the whole of England and Wales had received significantly low levels of rainfall. Late summer was especially dry in the south but then the autumn brought increased rainfall to southern and eastern England. This changed the focus so that at the year-end, the west, the midlands and some northern areas were the areas that had received significantly less rainfall than usual for the year.

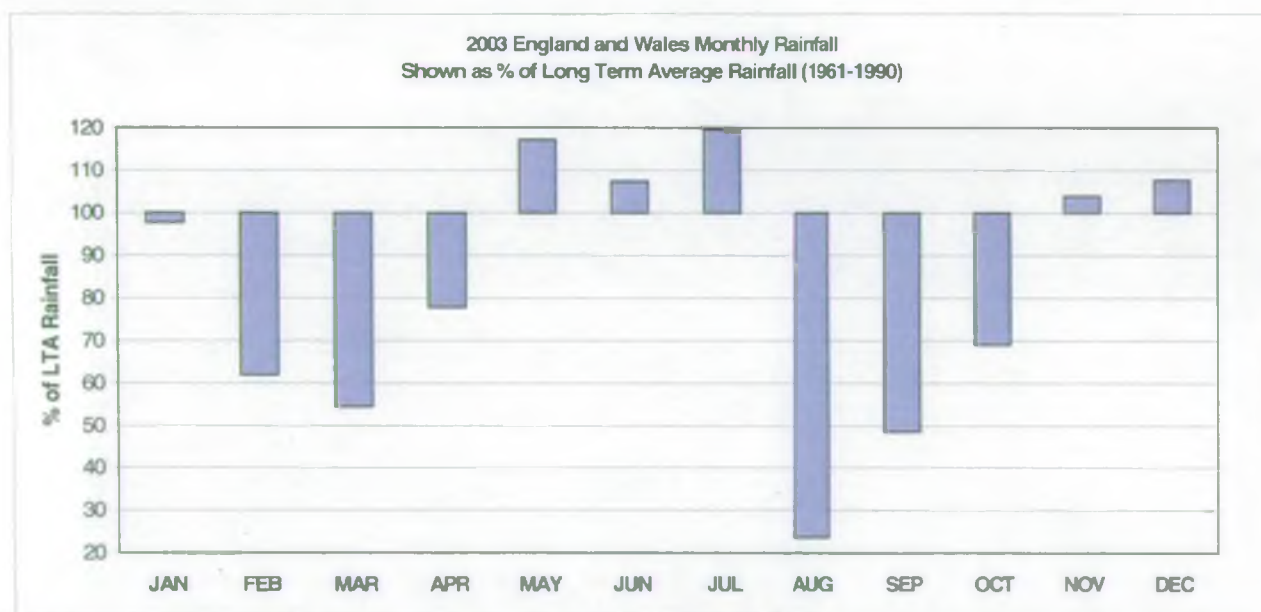


Figure 1: 2003 England and Wales monthly rainfall totals shown as percentage of long term average (LTA) rainfall for 1961-1990

Rainfall in November and December was above average, but not sufficient to make up the significant deficits that developed across England and Wales since January 2003. The deficits over this period are consistently higher than those recorded over the equivalent period in recent dry years, including 1984, 1989, 1990 and 1995. While cumulative rainfall deficits provide a good indicator of drought severity, the relationship with river flows, groundwater and reservoir levels is complex. Large deficits are therefore not necessarily a precursor to either water supply or environmental problems and do not need to be completely cleared for a drought to end.

Dry soils can slow crop growth and also delay the recovery of river flows and groundwater resources. The low summer rainfall led to exceptionally dry soils in some parts of southern,

eastern and north-eastern England. Soils were still very dry for the time of year in late December 2003.

River flows were correspondingly low across England and Wales. Accumulated run-off for June to October was the lowest ever on record at many sites and new daily or monthly minima were recorded at sites across the whole of England and Wales. Flows began to recover in October and some localised flooding occurred in some catchments in November and December. Localised flooding is possible during prolonged dry periods, as intense rainfall falling onto dry or compacted ground will run off rapidly causing river levels to rise swiftly.

Flows in impermeable catchments in the west were the first to recover. Rivers dependent on groundwater, including those in the south-east, began their recovery later and have generally started 2004 below their seasonal average but within their normal range.

Groundwater resources started 2003 in a healthy position, as the preceding autumn was wet. Levels started to fall in February and by late spring/early summer levels in many aquifers were either approaching, or dropping below, the seasonal average. By October groundwater levels across the country were below average, with the chalk aquifer in southern England worst affected, showing levels similar to those seen in the 1995 drought.

As a result of the very dry soils it took more rain than normal to make it wet enough for water to find its way through to the underlying aquifer and for groundwater levels to start to increase. Consequently, the replenishment of groundwater resources this year has started uncharacteristically late in many catchments across the south, south-west and the eastern edge of England.

At the beginning of 2003, combined reservoir supplies for England and Wales were 95 per cent full, but these receded significantly over the summer to reach a level of 50 per cent full in October. The recession and levels in October were similar to those experienced at the end of the dry summer of 1995. Stocks were lowest in north-west and southern England.

increased river flows in November caused gradual improvements in reservoir levels, with the smallest reservoirs in the wetter north and west beginning to refill first. The upturn in river flows in November and December led to a significant increase in reservoir storage across England and Wales (see figure 2 below). Most notable were the increases between November and December 2003 in the storage available to United Utilities and Thames Water, which rose from 60 to 84 per cent full and from 58 to 87 per cent full, respectively. At the year-end, combined reservoir supplies stood at 76 per cent full.

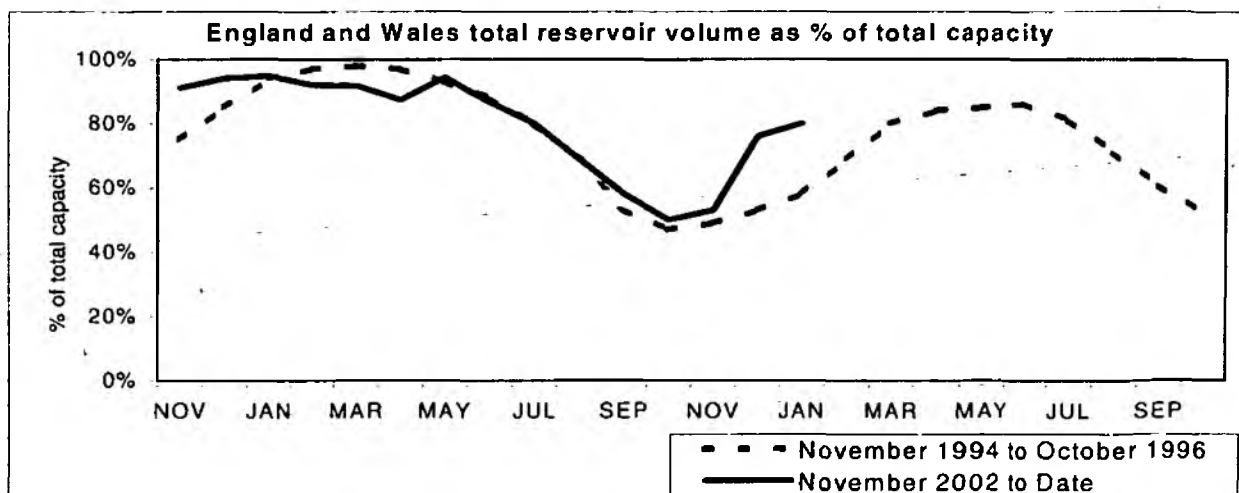


Figure 2: England and Wales total reservoir volume as percentage of total capacity

## 2.2 Water company actions in 2003

The best way to manage a drought successfully is to develop a comprehensive but flexible plan in advance and follow it. All the water companies in England and Wales revised their drought plans early in 2003 and the Environment Agency reported to Ministers on these in June 2003. This has put the companies in a good position to manage drought effectively.

While the spring and summer of 2003 were dry, this was not a particular cause of concern. The climate of England and Wales is naturally variable and all water supply systems are designed to cope with a dry summer. The very high temperatures experienced during August 2003 led to unusually high demand for water in some areas. During the summer, demand for water is usually highest in the late afternoon and early evening. Much of this peak demand is for garden watering. In a few places infrastructure limitations meant that it was hard to meet all of this demand. Some companies asked customers for restraint in garden watering but there were no hosepipe or sprinkler bans.

Rivers and reservoirs are usually at their lowest levels in early to mid-September and then recover with autumn and winter rainfall by early spring. In 2003, however, the dry weather continued through September and well into October. In many places reservoir levels continued to decline to unusually low levels. Early in October some companies were already expressing concern and by the end of the month many companies were reporting exceptionally low reservoir levels.

In the north-west of England, the Lake District reservoirs were particularly low; the largest resource zone of United Utilities had only a third of full storage by the end of October. At the same time, Thames Water's Farmoor Reservoir fell to 43 per cent full, with the London reservoirs at 47 per cent full. South East Water's Ardingly reservoir was only 15 per cent full by the end of October 2003. In the Midlands, Severn Trent Water's Derwent Valley and Tittesworth reservoirs were also causing concern. In Wales the "big five" reservoirs serving south Wales fell to 35 per cent full whilst the Elan Valley reservoirs approached the low levels seen in 1995.

In mid-October, Thames Water applied to the Environment Agency for two drought permits. One was to allow additional abstraction to fill Farmoor Reservoir. The second drought permit allows the company to continue to abstract from a borehole near Cirencester in Gloucestershire. The drought permits were granted on 12 and 13 November. Prior to this, Thames Water launched a publicity campaign to encourage customers to save water.

At the end of October, the Environment Agency and the water companies of south-east England issued a joint appeal for customers to save water. In early November, South East Water applied for three drought permits to allow additional abstraction to fill its Ardingly and Arlington reservoirs. The company also urged its customers to take simple steps that would help to save water. The drought permits were granted on 1 and 2 December.

In mid-November, United Utilities applied for three drought permits to allow additional abstraction from Windermere and Ullswater in the Lake District. The company also applied to the Secretary of State for the Environment, Food and Rural Affairs for a drought order to build a temporary weir at Ullswater, to facilitate abstraction. The drought permits were granted on 12 December and the drought order was granted on 22 December. The company also initiated a publicity campaign across the north-west of England.

Severn Trent Water significantly enhanced its water conservation campaign and in December applied for drought permits for Tittesworth, Ladybower and Derby St Mary's reservoirs.

Dŵr Cymru Welsh Water applied for three drought permits to reduce the compensation releases from Talybont and Pontsticill reservoirs and the Elan Valley group of reservoirs. The drought



permits for Talybont and Pontsticill were granted on 23 December. The water levels of the Elan Valley reservoirs recovered sufficiently over Christmas and the application was withdrawn.

Rainfall since November means that some of the drought permits granted to companies have not been needed. This does not mean that the applications were over-precautionary or unnecessary but illustrates how reservoir storage, as distinct from groundwater, can rapidly recover with prolonged and heavy winter rainfall. The companies made their decisions based on the threat to public water supply at the time of application. We expect companies to follow their drought plans and make applications for drought permits and drought orders as soon as they appear necessary.

No compulsory customer restrictions have been in place during the autumn and winter.

## 2.3 Environment Agency actions in 2003

The Environment Agency has a number of roles in a drought. We monitor drought development and any environmental impact that results. We provide information to the public so that people understand the situation. We are also responsible for issuing drought permits and advising the Secretary of State or National Assembly for Wales on applications for drought orders.

In June 2003 we published our review of water company drought plans. We reported that all water companies have drought plans in place, but that some needed immediate action to ensure that they were complete. Many companies needed to carry out further work on baseline environmental studies at sites where they would consider applying for drought orders or permits. Nearly all the water companies agreed to make their plans or a summary of their plans available to the public for inspection.

Throughout the year we published our monthly water situation report on our internet site and kept officials at the Welsh Assembly Government and Defra informed on a regular basis. Our water situation report covers rainfall, river flow, soil moisture, groundwater levels and reservoir levels. Making such information widely available on a regular basis allows all those who are interested to understand the situation. We also carry out regular environmental monitoring. This enables us to identify areas where there is the potential for environmental damage, and allows us to take appropriate remedial actions.

During the summer and autumn we convened our local drought teams so that we could take appropriate actions. We talked to water companies to ensure they were following their drought plans and liaised with other abstractors such as spray irrigators. We made national and local press releases in October to make the public aware of the situation. We followed this in November with a successful press campaign, led by our Chief Executive, to explain that droughts need to be managed even during the winter and that a few days of rain does not mean a drought is over.

## 2.4 Impacts on other users in 2003

The fine weather in 2003 led to some problems amongst abstractors, particularly for farmers. Restrictions were imposed on some spray irrigation abstractions. Dry soils meant that crops such as potatoes and sugar beet could not be harvested without being damaged. Autumn-planted crops such as winter oilseed rape failed to establish and wheat needed to be redrilled in some places. As the dry weather continued, there was increased concern about reservoir levels and the possibility of future water shortages in some areas.

Rivers in many areas experienced low flows whilst some smaller streams completely dried up.

There were a number of fishkill incidents caused by a combination of high temperatures, low flows and low dissolved oxygen levels. Low water levels also led to an increase in fish poaching incidents. Fish migration was delayed because of the low river flows in some areas such as Wales, the south-west and the north-east. Following heavy rainfall, fish migration has now been successful and stocks are well distributed throughout the catchments.

The good weather had little adverse impact on navigation; the majority of navigation waterways remained open and unrestricted. The only exception was the Macclesfield canal where there were local restrictions for approximately two weeks.

## 2.5 Water situation in January 2004

January 2004 continued wet and unsettled. Heavy rain in the second week helped to hydrate soils finally in the drier south and east. River flows have responded well to increased rainfall. Many are now in their normal range for the time of year.

The dry summer and autumn has meant that the onset of groundwater recharge is particularly late. Water levels are lowest, generally below the long-term average and close to record minima, in parts of the chalk aquifers along the eastern edge of England and south-west and southern England (for example Sussex and Kent). Levels in the slower responding Triassic sandstone in the Midlands are within their normal range. While the response to rainfall since November 2003 is patchy, levels in most aquifers, except the sandstone, are now starting to increase. Recharge is predicted in nearly all aquifers by the end of January.

The marked improvement in reservoir levels that began late in 2003 has continued in 2004 with storage in many reservoirs increasing by 5 to 6 per cent in the first week of January. While most reservoirs are still below their average level for this time of year especially in parts of the south and east, only a very few remain close to previous record levels. The reservoirs that continue to be especially low include South East Water's Ardingly reservoir, which was less than 50 per cent full at the beginning of January and is recovering only slowly.

# 3 Prospects for 2004

Rainfall since November 2003 has helped to alleviate immediate problems. However, the possibility of a shortage of water next summer depends on the rainfall that we receive over the next few months. This part of the report looks at the prospects for the spring and summer of 2004. First we look at the effect of average and below average rainfall on river flows and groundwater. Next we examine the implications for public water supply and the areas that need particular attention. After this, we look at the implications for other abstractors and water users. Finally, we consider the possible impact on the environment.

## 3.1 Prospects for river flow and groundwater

With average rainfall over the remainder of the winter, river flows in catchments that are mainly fed by non-groundwater sources are unlikely to experience notably low flows in the spring and summer. If we receive less than average rainfall there is an increased chance that river flows will be low, and a risk that some reservoirs will not completely refill before the onset of drawdown in the spring.

With average rainfall, groundwater levels in the chalk aquifers are likely to remain below average but above recorded minima. Increases in groundwater levels in these aquifers are expected to continue until at least March or April, before declining over the summer months.

Because groundwater levels in many areas, such as the chalk aquifers, are still below average, rivers that depend on groundwater will be likely to experience low flows in the spring and summer of 2004, even with average rainfall over the remaining winter months. The low flows might lead to impacts on the water environment, restrictions on abstractors and impacts on the use of rivers for recreation and navigation.

With less than average rainfall, the magnitude of the recovery in groundwater levels will be reduced and the duration extended. Moreover, some groundwater levels, for example in the chalk aquifers in parts of Sussex and Kent, may approach recorded minima at some point over the summer period. While the Triassic sandstones in the Midlands have yet to show the effects of the shortfall in rainfall in 2003, below average rainfall again in 2004 may lead to particularly low levels in 2005 as would be expected after two years of dry weather.

### 3.2 Prospects for public water supply

Rainfall over the last three months has improved prospects for all water companies. Most companies are reporting that the risk of supply problems in 2004 is now no higher than in an average winter.

This section of the report first looks at the companies that have applied for drought permits or orders.

- United Utilities has not had to use the extra abstraction allowed by its drought permits and orders. Rainfall and resource optimisation has left total reservoir storage only a few per cent below average for the time of year. Groundwater levels are healthy.
- Thames Water's reservoir levels have also improved significantly and the company expects all reservoirs to be full by the end of January. Groundwater levels are still low. Average rainfall through the spring and summer should mean that the company has no problems. The unlikely event of significantly lower than average rainfall would lead to progressive restrictions on water use from mid-summer onwards.
- Severn Trent Water has calculated that average rainfall through the spring should give no supply difficulties in 2004. Below average rainfall would present it with a slightly higher level of risk.
- Dŵr Cymru Welsh Water has seen good reservoir recovery across south-east Wales over recent weeks. Resource management should not be different from any other year.
- South East Water believes that with average winter rainfall it will be able to maintain supplies despite low groundwater levels. With below average rainfall, the company is confident of ensuring supplies during the spring but restrictions to preserve groundwater supplies may be necessary.

Next we look at the prospects for 2004 for all companies.

In the north of England, the English Midlands, Wales and parts of south-west England, water companies use upland reservoirs for a substantial proportion of their supply. The companies in these areas now have resources that are broadly in the normal range for the time of year. A few reservoirs may still be low even in these areas but operating systems are in place to mitigate any impacts of this. For example, although Derwent Reservoir in Northumbria is low at the moment, it will not have an impact on public water supply or the environment given that support can be provided by Kielder Reservoir. An exceptionally dry spring and summer could still lead to some supply problems for these companies in 2004, but these should be no more severe than those managed successfully in 2003.

We are more concerned about the prospects for companies that rely on groundwater sources. Recharge has begun but much of the groundwater in the south and east of England is well below

normal levels. Average or slightly below average rainfall through the spring will leave groundwater levels low but in a range that should present few problems for water companies. However, below average rainfall could present some problems.

In south-east England, low rainfall over the spring could lead to extremely low groundwater levels during the summer of 2004. The water companies are working together to ensure that steps are taken to optimise the use of reservoirs, groundwater sources and inter-company bulk transfers. However, low rainfall over the coming months would probably lead to summer restrictions on water use by customers for some or all companies and to further applications for drought permits and drought orders. Water companies in south-east England will need to pay particular attention to optimising resource use and to ensuring that customers understand the need to save water. If low rainfall continues into the autumn, significant problems will arise for supplies in this area for the summer of 2005.

In East Anglia and the Thames basin, low rainfall in the spring may lead to local problems during summer 2004 but there should be sufficient water available to minimise these. However, these areas have water resources systems that are sensitive to long periods of fairly dry weather rather than intense summer drought. If a dry spring in 2004 is followed by a dry winter in 2004-2005, there could be significant supply problems in the summer of 2005.

The position in south-west England is similar to that of East Anglia and the Thames basin. Most of the water companies expect few problems over the summer but a further dry autumn and winter could lead to difficulties in refilling reservoirs for 2005.

Some companies have told us that soil shrinkage due to the very dry weather of 2003 has led to increased leakage. It will be necessary for all companies to monitor leakage even more carefully than normal and, if necessary, increase leakage control activity.

### 3.3 Prospects for other sectors

This part of the report looks at the prospects for water users who do not rely on public water supply.

**Agriculture** uses water for many purposes. Many farmers have developed winter storage reservoirs for summer spray irrigation. The low flows in the autumn meant that some farmers were not able to start filling their reservoirs. Recent increases in flow should mean that most farmers would be able to fill winter storage reservoirs before the beginning of April. However, a return to exceptionally dry weather in February and March could mean some reservoirs start the spray irrigation season lower than normal.

Low rainfall over the next few months would lead to low groundwater levels in southern, eastern and north-eastern England. In these conditions farmers with shallow boreholes may not be able to abstract water. If groundwater levels and associated river flows are exceptionally low, it may also be necessary for the Environment Agency to restrict spray irrigation in some catchments. If this looks likely, we will work with farmers to minimise the impact by first seeking voluntary reductions in water use. It is important to note that such restrictions apply only to spray irrigation and not to other agricultural water uses.

**Industry** also uses water from direct abstraction. Few industrial abstractors now rely on surface water abstraction but many factories and businesses have boreholes. Shallow boreholes may experience problems if groundwater levels are particularly low in the summer and autumn of 2004. However, with low rainfall over the spring, conditions are likely to be similar to those experienced in 1995 and boreholes that proved reliable in 1995 should continue to provide adequate water in 2004.

Drought periods can also lead to low summer flows in rivers used for **navigation**. Historically there have been problems with boats grounding in rivers such as the Great Ouse and the Nene. This can cause considerable disruption to people's boating holidays. In 2003, the majority of the waterways remained open and unrestricted. Most canals should not be adversely affected in 2004 either, as the majority of the canal system's reservoirs should have filled over the winter and any shortfalls made up from other sources. However, a very hot, dry summer could lead to problems in some parts of the network; British Waterways identify the Crinan Canal, Peak and Potteries, Shropshire Union, Birmingham Canal Navigations, Oxford and Grand Union and Grand Union South as the hydrological units at most risk. British Waterways has a range of contingency measures planned should this occur and will update these plans as the season progresses.

Our rivers are particularly important for **recreation**. Low groundwater levels in the south and east would lead to low river flows through the summer in these areas. The quality of fishing may be affected. Some upper reaches of groundwater-fed streams would be dry and other parts of rivers may look less attractive than normal.

### 3.4 Prospects for the environment

Aquatic systems are adapted to cope with periods of natural drought, but additional pressure on the water resources from water users during these periods of stress can sometimes cause serious effects on the habitats and species present.

Impacts from the dry summer and autumn of 2003 have largely remained within the normal range that would be expected during a dry year. Delays in fish migration have been reported in Wales, the south-west and the north-east of England due to the dry autumn, but average rainfall during November and December was sufficient in most areas to allow late migration and spawning. Fish kills due to the low oxygen levels and increased temperatures, and increased poaching due to low river levels, which cause fish to be stranded in ponds where they are easier to catch, have occurred in the north-east, south and south-west of England.

Low reservoir levels can result in a change to the water quality that is released into rivers below the reservoir. Increased silt can be released into the river, which in turn impacts upon habitat and water quality downstream of the reservoir. Rivers in the north-east where this has occurred have improved due to recent high flows and the impact of silt on downstream spawning areas has not been serious.

Fish stocks in reservoirs and lakes in the south and north-east have also suffered due to the low water levels and algal blooms, which result in low oxygen levels. Applications to the Environment Agency for drought permits and a drought order upstream of European designated riverine sites in Wales and the north-west had to be carefully assessed.

Prospects for spring and summer depend greatly on rainfall over the next few months. Low winter rainfall will compound those impacts already seen and may result in significant ecological effects. Species at groundwater-dependent sites and rivers will be most at risk from water shortages this summer. Lower than average water levels in some groundwater-dominated-rivers, such as chalk-streams, are already causing concern. Significant effects on trout and crayfish populations in dried-up headwater streams in Thames and the south have been reported. Future monitoring will indicate whether populations in these stretches are naturally recovering.

Wetland sites are likely to suffer from a decline in habitat quantity and quality over a period of time. Short-term effects on these sites will be seen as reductions in standing open water and impacts on wildlife, such as birds, which rely on these. The Environment Agency has already initiated action on the Somerset Levels to ameliorate effects on over-wintering birds. Wetland sites in the south and east of England that are reliant on groundwater may potentially suffer this summer.

# 4 Actions

This part of the report looks at the actions that will be necessary to manage drought in 2004.

## 4.1 Environment Agency

The Environment Agency will play an important role in co-ordinating and managing the actions that are necessary to deal with drought during the coming year.

We have established our head office drought team, led by the Head of Water Resources Regulation. This team monitors and reports on the situation across England and Wales. We produce a detailed monthly water situation report, which is published on our internet site. While drought conditions persist we supplement this with a weekly summary on the internet of the latest situation and drought orders and permits applied for and granted. The head office drought team will also co-ordinate any widespread communications campaigns that become necessary during 2004.

Our seven regions in England and Environment Agency Wales also have their own drought teams. These teams lead the local management and monitoring of drought and its effects. They play a crucial part in ensuring that water companies and others are taking appropriate actions at the right time. As part of this work, we are in close liaison with water companies. We will continue to monitor companies' actions against their drought plans and where appropriate we will help companies with their drought activities. For example, in south-east England the water supply system is complicated and optimising the use of resources requires many water companies to work together. We bring the companies together and provide a forum for discussion and decision-making. We will also continue to ensure that water companies pay attention to the needs of other water users and the environment when making decisions about drought actions.

The Environment Agency will continue to work closely with other water users at a local level. For example we liaise with spray irrigators and where possible provide forecasts of when and where any restrictions may be needed.

We will use our environmental monitoring teams to evaluate the effects of drought on wildlife and plants. Where possible, we will take actions to mitigate serious impacts. For example, we will use our river support schemes to improve flows in rivers that are suffering as a result of low flows. We are also ready to take emergency action to deal with serious problems in rivers that are affected by drought. For example, we may need to carry out fish rescues in locations that are particularly stressed.

We also have an important regulatory role in a drought. Our enforcement teams will work to ensure that all abstractors are operating within the terms of their abstraction licences. Illegal abstraction during a drought can not only seriously damage the environment but also affect other legitimate abstractors and water users. Where we find such illegal activity we will take appropriate enforcement action.

We are also responsible for deciding on drought permit applications. We have set out procedures for this, which can include a public hearing by an independent inspector if there are substantive objections to the application. We will continue to make transparent and fair decisions about drought permit applications.

We will report again in May on the prospects for the rest of 2004. When the drought is over, we will carry out a post-drought review to ensure that we, and others, make best use of the experience gained.

## 4.2 Water companies

All water companies are monitoring their resources carefully and keeping the situation under active review. They all intend to continue with this through the spring and summer of 2004.

It will be important for companies to take actions as soon as they become aware of an increased threat to public water supply. The present water situation means that this particularly applies to water companies in south-east England. Further dry weather in February and March could lead to water shortages in the summer. We expect to see companies monitoring the situation carefully and taking timely action to make the best use of available resources. Actions that can be taken include:

- Increased operational activity to manage leakage;
- Publicity campaigns to ensure that all water users are aware of both the need to save water and what they can do to help;
- Imposition of hosepipe and sprinkler bans;
- Applications for drought orders to restrict non-essential water uses, such as ornamental fountains;
- Applications for drought permits and drought orders to change abstraction conditions or to allow additional abstraction;
- Carefully balancing the use of resources;
- Early completion of bulk transfers;
- Improvements to inter-connectivity between supply zones.

These actions are all included in water companies' drought plans. It will be particularly important for the companies in south-east England to follow their plans closely. If there is dry weather through February and March, it will be necessary to enhance publicity with co-ordinated campaigns that ensure that the public understands the severity of the situation. We expect companies to be planning these campaigns over the coming weeks so that they are ready for use early in the spring. We will also expect companies to apply hosepipe bans early in the spring if necessary. These both save water and send a useful and important signal to customers. Our published policy is that we would normally expect hosepipe bans to be imposed before granting drought permits, or supporting drought permit applications, that affect the environment. We did not insist on this during the winter because of the limited water savings that are available from winter hosepipe bans, but we will take this policy into account in determining drought permit applications as we move into the spring.

All water companies should keep a record of decisions and actions. This will allow them to review their drought plans and ensure that they make best use of the experience they have gained. The Water Act 2003 has made the regular submission of drought plans a statutory requirement. In line with our drought plan guidelines, we expect all water companies to review their drought plans to ensure that they remain current and we will work with the companies to help them with this.

## 4.3 Other abstractors

All abstractors will need to review their water needs to ensure that they understand the best way to manage their resources. The Environment Agency will continue its usual dialogue with sectors that may be affected, for example in some regions we publicise prospects for spray irrigation in the coming season.

Where sources have proved reliable in previous droughts no further action should be necessary. However, where sources have suffered in previous drought years, abstractors should consider the effect of possible water shortages and the options that are available to them. In some cases it

may be possible to use public water supply but other abstractors with unreliable sources may need to think about ensuring that they are able to deal with any shortage of water.

## 4.4 The public

The public plays an important role in the management of a drought. By reducing their demand for water, people can help to maintain supplies through dry periods whilst minimising impacts on the environment.

Simple measures that help to save water include:

- Mending dripping taps;
- Turning off the tap when brushing teeth;
- Washing the car using a bucket rather than a hosepipe;
- Taking a short shower rather than a bath;
- Only watering the garden when it is really necessary and only watering plants that need water;
- Considering planting varieties of flowers and shrubs that thrive in drier conditions.

People can also help water companies by reporting leaks as soon as they notice them. In the winter it is also important to ensure that household pipes are lagged to prevent bursts.

## 5 Conclusions

Recent rainfall has improved prospects significantly. However, there could still be drought-related problems in the summer and autumn of 2004 if the rest of the winter and the early spring are dry.

We are particularly concerned about the possibility of summer and autumn water supply shortages in south-east England. Water shortages are far from inevitable; average rainfall through the winter and spring would resolve most of our concerns. However, dry weather over the next few months may lead to problems. We will work with the water companies in this area to ensure that they continue to monitor the situation carefully and take appropriate actions at the right time.

The events of 2003 have confirmed the need for good water resources and drought planning. With continuing pressures, particularly for development in the south-east, it is clear that these planning processes will be of continued importance.

We will work to continue the positive dialogue that has been taking place between the water companies and the Environment Agency. This useful exchange of data and information has ensured the management of this dry period according to the water companies' drought plans.

We will continue to monitor the situation closely and keep Ministers informed of progress. We intend to write a further report in May 2004 looking at the immediate prospects for the summer, highlighting any areas where we remain concerned and the actions that need to be taken by the Agency, water companies and other water users to secure supplies over the summer period.



# References

Environment Agency (2003) *Review of water company drought plans - a report to Government*. Environment Agency: Bristol.

Environment Agency (2002) *Drought plan guideline*. Environment Agency: Bristol.

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