

EA-Thames BOX 2



Water resources for the future

A SUMMARY OF THE STRATEGY FOR THAMES REGION

March 2001



ENVIRONMENT AGENCY

Water resources for the future

Water is vital for life

All living things need water to survive. People rely on water not only for drinking and for personal hygiene but also for many other purposes:

- around our homes, for cooking, washing and cleaning;
- in our gardens, to water plants;
- on farms, to water crops and clean equipment, and for animals to drink;
- in offices, schools, universities and hospitals, for cooking and cleaning;
- in commerce and industry, to help with manufacturing.

All the water we use is taken from streams, rivers or water-bearing rocks below the ground (aquifers). Water in the environment - in streams, rivers and wetlands - serves many other purposes that we must take into account. It allows plants to grow and keeps fish, insects and mammals healthy. It also gives people pleasure in many ways. We like the appearance of rivers and streams in the landscape, and many of us enjoy fishing, boating, canoeing or just walking by rivers. Our use of water needs to safeguard these benefits.

A water resources strategy for Thames Region

Government has given the Environment Agency the task of planning our use of water. As part of this process, we have developed a new water resources strategy for our Thames Region. At the same time we are publishing seven other strategies for the rest of England and Wales, as well as a national strategy providing an overview. This leaflet summarises the strategy for the Agency's Thames Region.

Thames Region, shown in Figure 1, comprises virtually the entire basin of the River Thames, from the Cotswolds to east London. The Cotswolds, the Berkshire Downs, the Chilterns and the intervening clay vales fall within the region, along with the highly urbanised Thames Valley and Greater London. With a total land area of some 13,000 km²,

the region covers about eight per cent of England and Wales, but is home to nearly a quarter of their combined population. The region's population density is thus three times the national average, which means that human needs impose significant pressures on water resources.

Thames Region has many wildlife habitats that are recognised and protected by national laws and EC directives. A number of these are important Biodiversity Action Plan (BAP) sites. Water is an essential element of such habitats, and plays an important role in defining the essential character of our region's landscape.

Planning our use of water

In an average year, Thames Region receives enough rain to cover its entire area to a depth of 690 mm. Almost two-

Figure 1 Thames Region

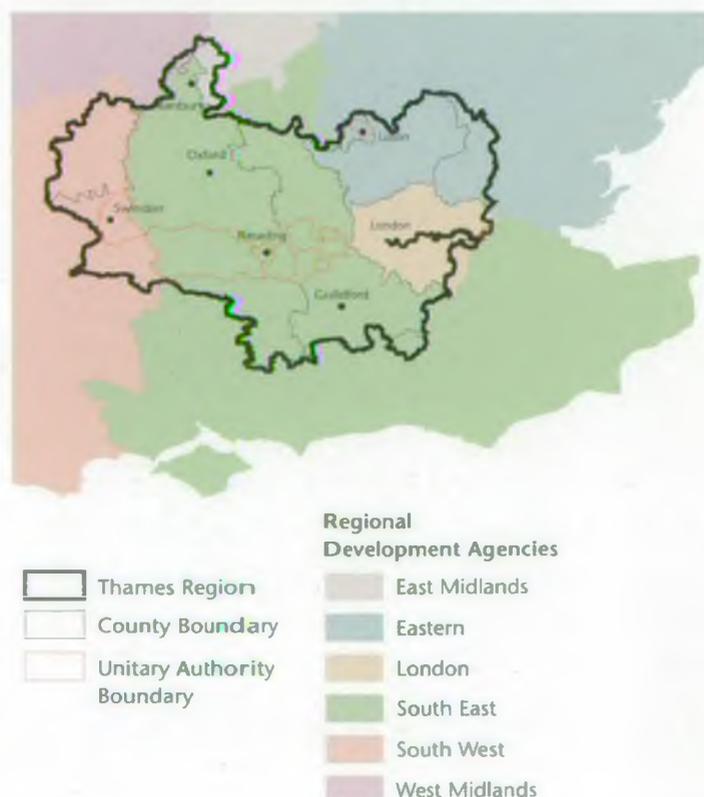


Figure 2

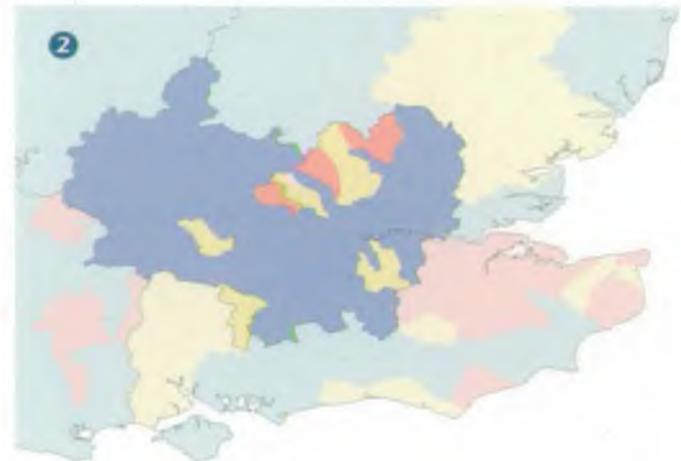
Resource availability: 1. Summer surface water 2. Winter surface water 3. Groundwater resource



Environment Agency
Regional Boundaries

Resource Availability – Thames Region

- Additional water available
- No additional water available
- Unsustainable abstraction
- No aquifer



Resource Availability – other Regions

- Additional water available
- No additional water available
- Unsustainable abstraction
- No aquifer

thirds of this either evaporates or is used by trees, crops and other growing plants. The remainder, known as effective rainfall, percolates into groundwater and supports our streams, rivers and wetlands, and is equivalent to about 700 litres each day for every person who lives in the region. Effective rainfall is unevenly spread through the year, with much of it occurring in winter months. We can't use all of this water, because we want to leave enough in our rivers and streams to protect nature and allow us to enjoy our landscape. In a dry year our use of water can lead to problems. Since every drop of water that people take comes from our natural environment, we need to plan our use of water to make sure that we have enough for our needs while protecting plants and animals from damage.

Our strategy reflects these issues. It looks 25 years ahead, and considers the many changes that may occur over this time. Our vision is:

Enough water for all human uses with an improved water environment.

The availability of water

In Thames Region, we abstract an average of about 5,000 million litres of water per day (Ml/d) from our rivers, streams and aquifers. Some 85 per cent of this is for public water supply, and the remainder is abstracted directly by industry and agriculture for their own use. Household use accounts for half the water put in public supply, and industry and commerce a little less than a quarter. The rest of the water put into the public supply is largely lost

through leakage from the distribution system, a major concern in the region.

Non-public water supply abstractions comprise 700 Ml/d for industry, commerce and agricultural use, including 20 Ml/d for spray irrigation. Principal uses in the region include cooling water for power generation and for manufacturing, process water, sand and gravel extraction, fish farming and cress growing. The quantity of water abstracted for spray irrigation is small, but demand for it is concentrated in summer months, when river flows are at their lowest.

Total abstraction in the region amounts to some 55 per cent of our effective rainfall. We achieve this by successively abstracting water for use, purifying it and returning it to our region's single river system to help sustain other abstractions further downstream.

We abstract our water from surface sources – rivers and reservoirs – and from aquifers. When flows are high, we abstract directly from rivers. Reservoirs can be replenished then, and used to store water for use in dry periods when river flows are low. The principal reservoirs in Thames Region include Farmoor, near Oxford, and the two large groups to the west of London and in the Lee Valley. Aquifers underlie much of the region and play a vital role as natural reservoirs, storing effective rainfall and then slowly releasing it to our rivers and wetlands. Our major aquifers include the Oolitic limestone of the Cotswolds, the chalk of the Wiltshire and Berkshire Downs and Chiltern Hills, and the lower greensand in Hampshire and Surrey. There are also a number of locally important minor aquifers. Natural replenishment of the chalk aquifer under London is now being supplemented by pumping water into it at times of high river flow, so that

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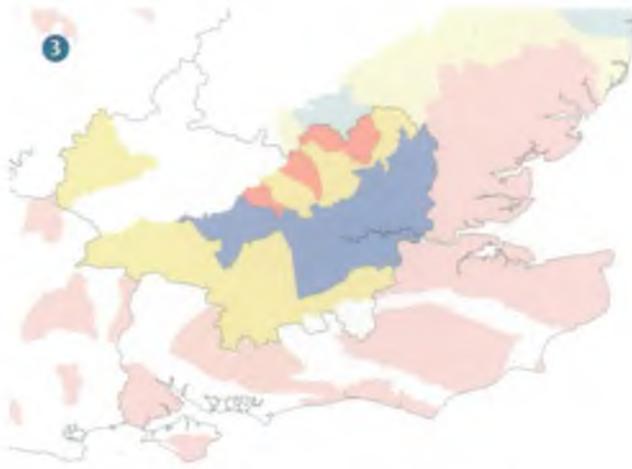
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more water can be drawn from it during droughts. This practice is known as artificial recharge.

In some places we think that too much water is taken already. The environment may already be damaged or is in danger of being damaged here, so less water must be taken if we want to restore the environment in such places. For example, we are taking action to restore flows on critically affected rivers in the Berkshire Downs and Chilterns. There are also areas where we think there is no damage now, but no more water should be taken. Almost anyone who wants to abstract water needs a licence from the Environment Agency. Before we give a licence, we must be sure that it will not cause damage, and detailed studies are often necessary.

The maps in Figure 2 illustrate water availability for our region. They show that summer surface water throughout the region is fully committed to existing abstractions and to the environment. Further limited resources remain available from the middle Thames chalk and the confined chalk aquifer under London, but elsewhere groundwater resources across large parts of the region are now at or approaching full utilisation. Further winter surface water resources are available, but would need to be developed in conjunction with reservoir storage to provide continuously reliable resource. We will always consider developments that improve the environment.

Future demand for water

The amount of water that we need is known as demand. The demand for water will change over the next 25 years, under differing influences of a variety of factors.

In the home, we each choose how much water we use. We need water for washing, bathing and cooking, to water our gardens, and to wash our cars. Today, on average we each

use 150 litres every day – enough to fill about 15 buckets. Future household water use depends on the choices that we make as individuals and collectively as a society. For example, showering usually takes less water than a bath, but using a power shower for five minutes can use more water than taking a bath. Depending on attitudes, individual household water use could increase or decrease over the next 25 years. In some places, more homes are planned. While individually any new homes built could be more water-efficient, they will add to the total demand for water.

Similar arguments about the effect on demand of differing water use practices apply to industry, commerce and agriculture. Their needs for water are also affected by market considerations, such as the price commanded by different products or crops.

To consider many of these different effects, we have taken a scenario approach to predict future demands. The Government's Foresight framework looks at different ways that our political and social values could change over time; we have used it to consider a range of social and economic changes, and calculated the resulting future demands.

Current and likely future demands in Thames Region are dominated by public water supply. The rate of growth predicted by government planners for the region could lead to 700,000 additional households and a population increase of 800,000 by 2025.

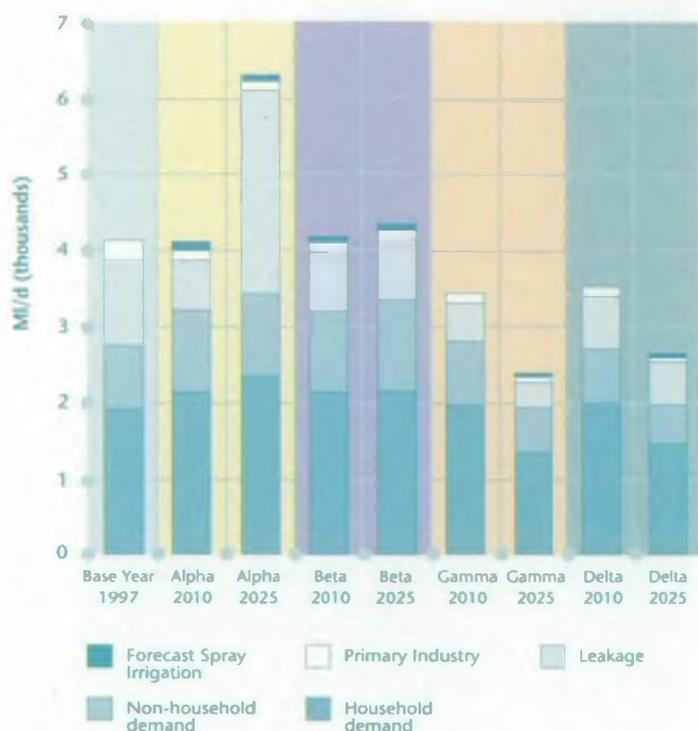
Figure 3 illustrates our demand forecasts for Thames to 2025. The forecasts show that total demand for water could rise or fall significantly over the next 25 years, depending on the scenario followed. Although in practice it is unlikely that the future will closely follow any one scenario, by showing what could occur under each, we have identified boundary limits to guide our resource planning.

Climate change

Climate change is of great significance to water resources. Changes in rainfall patterns and amounts could affect how much water is available for people and for the environment. Climate change could also influence people's demand for water. For example, if it becomes hotter, we may wish to water our gardens more.

Present analysis suggests that over the next 25 years, summers could become drier and winters wetter, with more rain in total. Temperatures are likely to increase. Since many questions remain about the effects of climate change, it makes sense to use our existing water resources carefully, and to look for flexible solutions to future demands that can cope with different climatic conditions. This is an area that we will keep under review.

Figure 3 Demand by scenario in 2010 and 2025



- the enhancement of public water supplies by up to 600 MI/d above present levels by improving existing schemes and developing, where appropriate, some new resources, may be required. New schemes may include further development of groundwater (including the use of rising groundwater and artificial recharge under London), the use of canals and enhancement of water transfers, new reservoir storage, reuse and recycling, and potentially desalination schemes;
- significant uncertainties remain about the extent to which demand in the region can be contained or reduced through further action on leakage and demand management. Progress in these areas affects the need for a major new resource development, which could take 12–15 years to promote and implement. We have identified a number of actions to help us overcome the current uncertainties, and to enable us to make an informed decision about the need for a major new scheme early enough to ensure that it can be implemented in good time if needed;
- increased water efficiency and water use minimisation should be an important aspect of resource management over the next 25 years. We therefore include a number of recommendations to encourage the efficient use of water in the home, in commercial premises, by industry and by agriculture.

We will publish an annual bulletin reporting on progress against the strategy, and review it fully in a few years' time.

Our strategy for Thames Region

Our strategy is designed to improve the environment, while allowing enough water for human uses. We have considered its contribution to sustainable development, including social progress that considers the needs of all, protection of the environment, making wise use of natural resources and maintaining high and stable levels of economic growth and employment. Our strategy is flexible and phased, so that we can avoid unnecessary investment while retaining the security of our water supply and improving the water environment.

Our strategy shows that:

- water is a precious and limited resource. Further improvements to the water environment are necessary in many places. To do this, we may have to recover 100–350 MI/d of current abstraction across the region;
- without further action to manage demand and reduce leakage, we will need new strategic water resources under some scenarios, by 2015 for the Upper Thames and by 2020 for London;
- to maintain a reliable public water supply further attention to leakage reduction is crucial, particularly in London where system losses are apparently high;

How to find out more

You can find more information in the full water resources strategy for Thames Region, available from our Reading office. Details of our strategies for other regions of England and for Wales can be obtained from regional Environment Agency offices. You can obtain our water resources strategy for the whole of England and Wales from Water Resources, Environment Agency, Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol BS32 4UD. Further information on all our water resources activities can be found on our website at www.environment-agency.gov.uk.

