EA-MIDLANDS

Water resources for the future

A STRATEGY FOR THE WEST MIDLANDS

March 2001

ENVIRONMENT AGENCY

A water resources strategy for the West Midlands

Government has given the Environment Agency the task of planning our use of water. To help with this, we have developed a new water resources strategy for England and Wales. This leaflet for the West Midlands provides a regional summary of the strategy.

We recognise the magnitude of the challenge facing us to achieve our strategy. There are pressures on our valuable diverse water environment from continued economic growth, new housing development, irrigation of crops, as well as the potential future impacts of climate change.

This strategy sets out a framework that will require action by many different organisations and individuals to achieve its objectives. Decision-making at a local and community level will always be important, but, increasingly, regional decisions are likely to affect the water environment. The Government Office for the West Midlands, Advantage West Midlands, the West Midlands Regional Chamber, the West Midlands Local Government Association, the West Midlands Sustainable Development Round Table and Local Authorities have a significant role to play in delivering our Water Resources Strategy and ensuring a sustainable future in the West Midlands.

We intend our water resources strategy to inform the plans and documents produced by these bodies, such as the Regional Planning Guidance, the Regional Economic Strategy, and Development Plans at county or local level, as well as individual planning application decisions. Together, we can influence the location, timing, and water management of new developments, encouraging social and economic improvements in the region without threatening environmental damage. The publication of our water resources strategy is an important step towards achieving sustainable development, and we look forward to working with others to deliver together the actions required to make our vision a reality.

Our strategy looks 25 years ahead, considering the many changes that may occur over this time.

Our vision is:

- enough water for all human uses with an improved water environment.

Our strategy concludes that:

- water is becoming a scarce resource and should not be taken for granted
- future developments in the West Midlands should recognise the limited availability of water as an influence on their location and timing, and should incorporate water efficiency measures and sustainable drainage systems at the feasibility or planning stage
- water abstraction cut-backs are necessary in some areas to improve the environment
- a 'twin-track' approach to meeting future demands should be followed, combining further water resource developments and improvements with sensible management of our demands through efficient use
- the River Severn has the potential to provide a sustainable source of further public water supplies, following commissioning of Shropshire Groundwater Scheme phases 4 and 5, and a review of the Severn Control Rules
- water companies should maintain the good progress made in recent years to reduce mains leakage, and further attention to leakage control may also be necessary
- over the next 25 years, we expect household water metering to become more widespread, providing a greater incentive for sensible use of water in the home, with appropriate tariffs to protect vulnerable households
- industry should strive to use water efficiently and realise the economic and environmental benefits
- farmers should strive to use water efficiently and consider opportunities to work with others to develop new sources of water and consider the development of winter storage to ensure reliable supplies
- climate change studies suggest summers could become drier and winters wetter. Water resource options that are flexible to the possible impacts of climate change are preferred
- mineral and aggregate companies should take steps to minimise the impact of their extraction operations on the local water environment.

The West Midlands has a valuable water environment in need of our protection. Warwick Castle on the banks of the River Avon.

Introduction

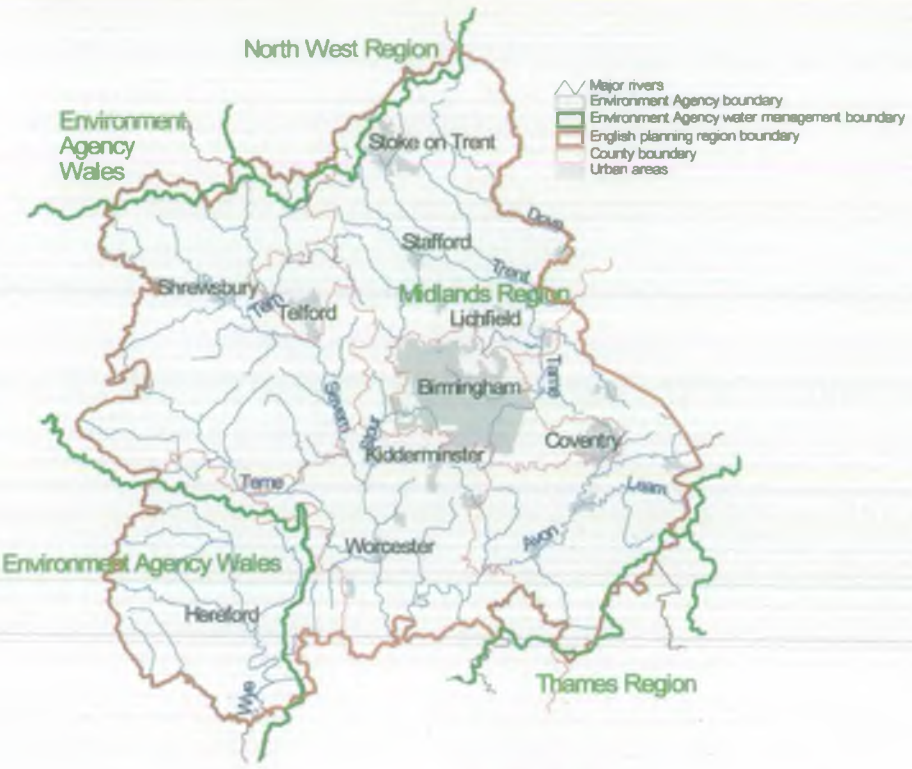
Water is essential for natural life and for human use. We use it in our homes and gardens, in schools, hospitals, commerce, industry and on farms. Most new developments also needs water, whether from a mains drinking water supply or direct from rivers, streams or water-bearing rocks below the ground (aquifers). Although our water is a renewable resource, it cannot be taken for granted as abstraction of water has a direct impact on the natural environment. Water in streams, rivers and wetlands allows plants to grow and keeps fish, insects and mammals healthy. It also gives humans 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.

Water resources strategy for the West Midlands

The Environment Agency has developed a suite of National and Regional Water Resources Strategies that will protect the environment while encouraging sustainable development. The strategies look 25 years ahead, considering the needs for water both of the environment and of society, and examining the uncertainties about future water demand and availability. This leaflet for the West Midlands summarises aspects of the Agency's Midlands Region Strategy and the Strategy for Wales. The findings in this document are relevant to everyone who has an interest in the future development of the West Midlands.

The West Midlands extends over about half of the Agency's Midlands Region, and roughly a tenth of the Environment Agency Wales water management area. Principal rivers in the West Midlands are the Rivers Wye, Severn, Avon, Stour, Tern, Teme, Trent, Sow, Dove, Tame, and their sub-catchments (Figure 1). The West Midlands landscape ranges from the rolling hills of Herefordshire and the Malverns, to the intensively farmed agricultural plains of the Shropshire Plain and Vale of Evesham, to the urban expanse of the Birmingham conurbation.

Figure 1 Regional boundaries in the West Midlands



Basis of the strategy

In preparing our strategy for managing water resources, we have considered the needs of the environment alongside those for public water supply, agriculture, and industry. We have taken into account population growth and housing projections.

Our strategy incorporates a number of principles underpinning the Agency's approach to water resources planning:

- prudent and sustainable use of natural resources
- to seek the efficient use of water while bringing forward timely proposals for resource development (the 'twin-track' approach)
- the need for the strategy to be robust to uncertainty and change
- where there is uncertainty about the consequences of a proposal, decisions taken should ensure that the environment is protected (the 'precautionary principle')

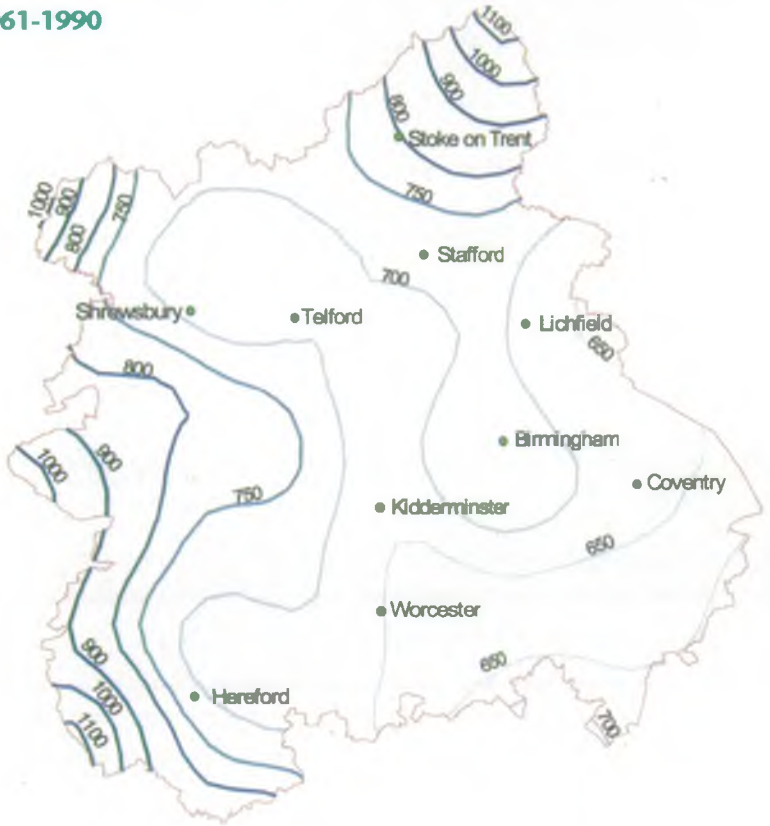
The availability of water

Our water resources in rivers, streams and aquifers are replenished by rainfall, but water is a finite resource and cannot be taken for granted. Our valuable natural environment and high population growth rate mean that the careful management of water resources is essential.

Parts of the West Midlands are among the driest areas of England and Wales (Figure 2) with annual totals in the Vale of Evesham less than 650 mms on average. In a typical year, the West Midlands receives enough rain to cover its entire area to a depth of around 750 mms. Some of this rainfall is taken up by trees, crops and other growing plants, and some evaporates. The balance is known as effective rainfall, and is equivalent to about 2,000 litres each day for every person who lives in the region. Effective rainfall is unevenly spread through the year, with much of it occurring during the winter months. We can't use it all, because we want to leave enough water in our rivers and streams to protect the aquatic ecology and allow us to enjoy our landscape. In a dry year, our use of water can lead to problems. Since every drop that humans take for public supply, industry and agriculture comes from our natural environment, we need to plan and manage our use of water to make sure that we have enough for our needs, while protecting plants and animals from damage.

Figure 2 Rainfall distribution across the West Midlands

Rainfall in mm/year 1961-1990



The maps in Figures 3 and 4 illustrate the water resources position for the West Midlands. They show that surface water throughout the majority of the West Midlands is already fully committed to existing abstractions and the environment in the summer, and that no significant further resource is reliably available. Exceptions include abstraction from the River Trent, and parts of the River Tame sub-catchment. However, there is scope for winter abstraction from most of the rivers. Anyone who wants to abstract water generally needs a licence from the Environment Agency. Before a licence is given, we must be sure that it will not cause damage and detailed studies are often necessary. Our Catchment Abstraction Management Strategies (CAMS) for the region, produced over the next seven years, will clarify at the local level where resources are sustainably available.

In those areas coloured red in Figure 4, the licensed groundwater abstractions exceed the sustainable limit, potentially affecting rivers and wetlands. Action to resolve the problems arising may involve changes to both surface and groundwater licences in the longer term. We are already working with water companies and other abstractors to restore sustainable abstraction rates in these areas, for example, through the Agency's National Environment Programme which includes nineteen sites in the West Midlands thought to be impacted by water company abstractions (Figure 5). The Agency will also complete the review of authorisations affecting the Habitats Directive sites and ensure actions are taken to modify or revoke abstraction licences where necessary to maintain international sites in favourable conservation status. The Agency will continue to work with English Nature and others on the investigations and actions summarised in our recent review of water abstractions on Sites of Special Scientific Interest (SSSIs). We will prioritise and monitor progress on these and other abstraction related concerns through our Restoring Sustainable Abstractions Programme within the context of our CAMS process.

Figure 3 Current indicative availability of water resources : surface water

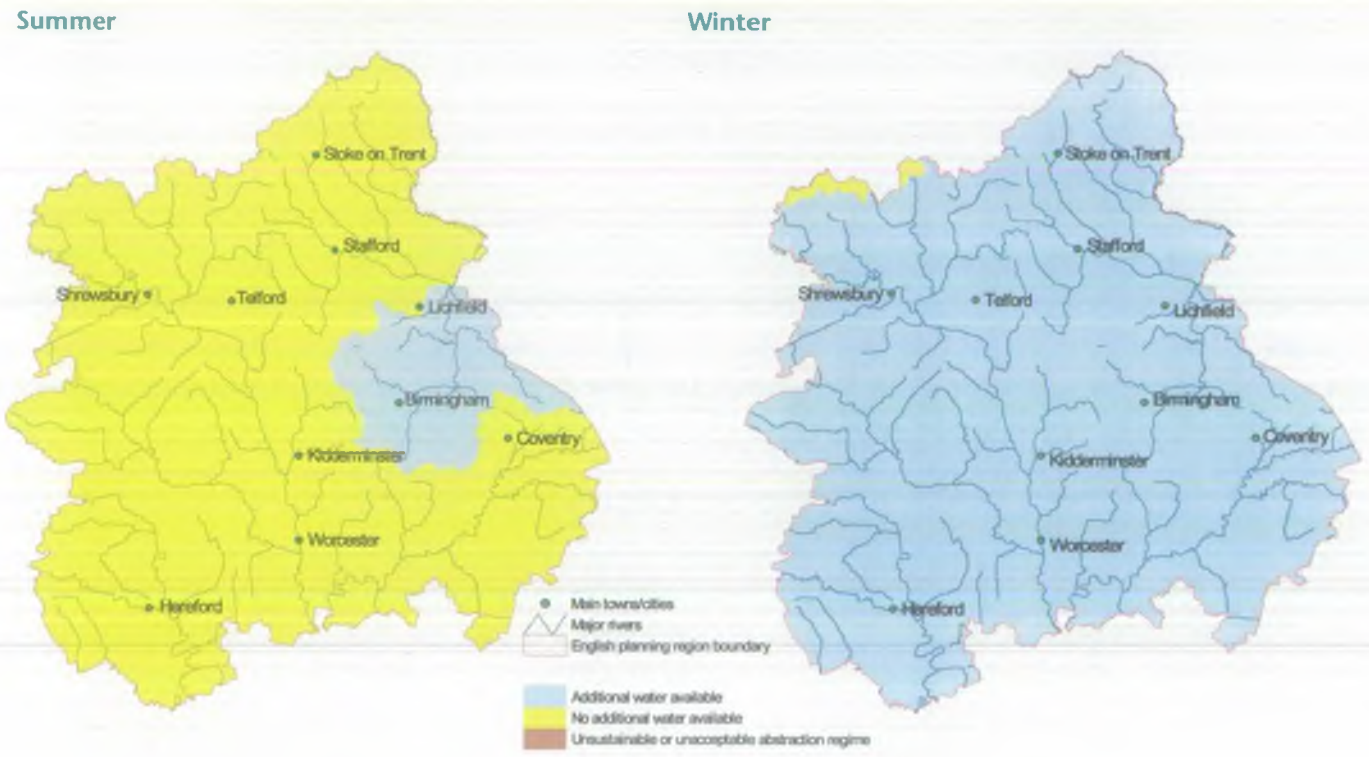


Figure 4 Current indicative availability of water resources: groundwater

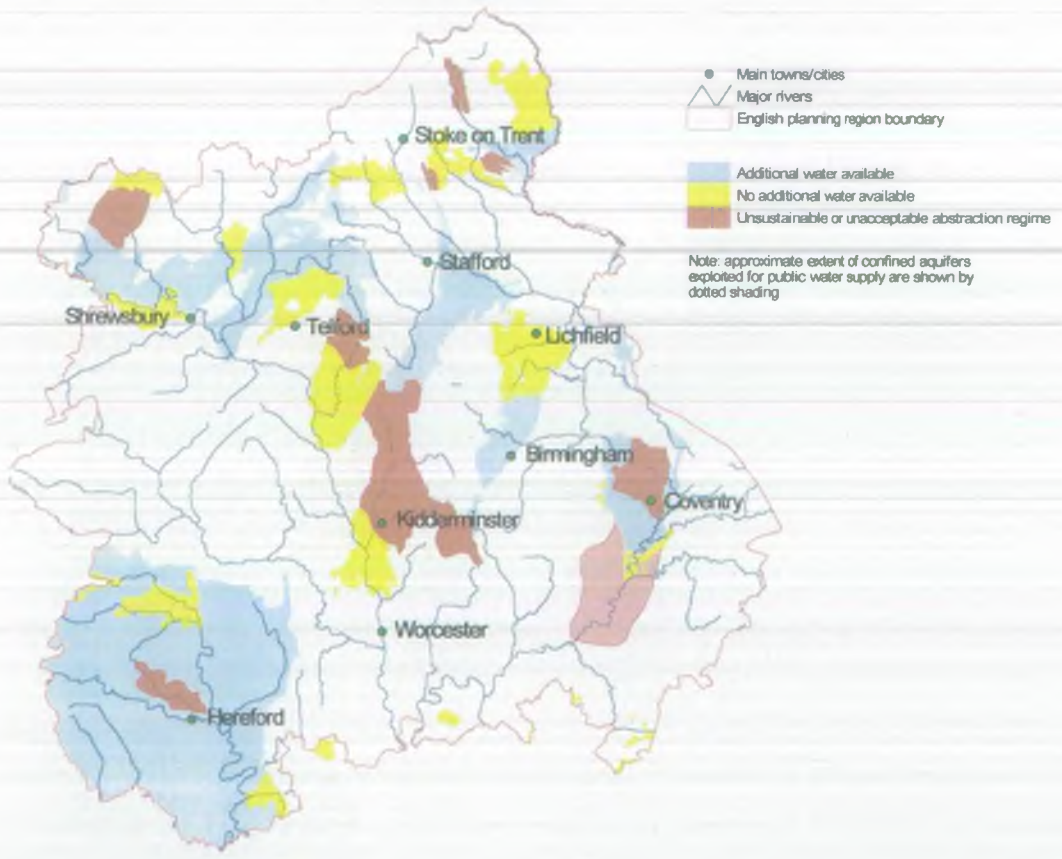
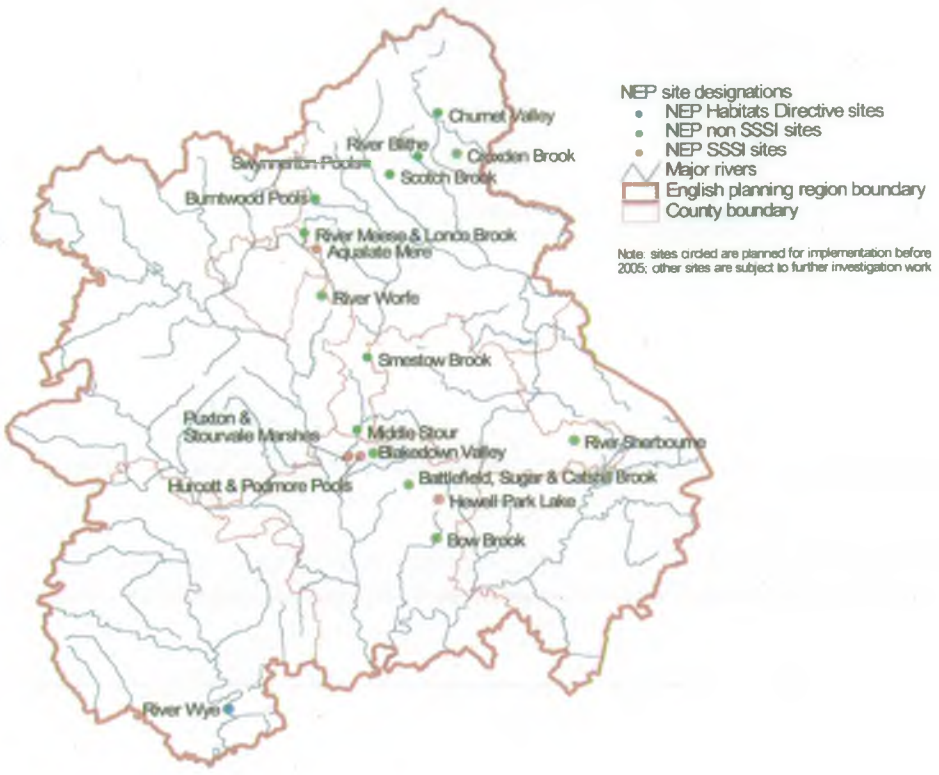


Figure 5 Water resources sites in the National Environment Programme



Present abstraction and use of water

The largest use of water is for public supply. Over 1400 million litres of water per day (Ml/d) are abstracted for public supplies in the West Midlands. Household use accounts for about half of this, and non-household about 30%. In addition, industries abstract around 230 Ml/d for their own direct use. Much of the water used for public supply and industry is treated and returned to the freshwater environment and is available for re-abstraction downstream, however, the treated water is often returned some way from where the it was originally abstracted.

Direct abstraction by farmers for spray irrigation amounts to an average daily abstraction of a further 80 Ml/d. It is mainly abstracted in the summer months when river flows are typically at their lowest. Peak day irrigation demands in the region can exceed public supply demand. Furthermore very little of the irrigation water is returned, so its potential impact on the water environment is heightened.

Water supplies in the West Midlands come from a range of sources. The area has a number of public supply reservoirs including Tittesworth, Blithfield and Draycote. In addition, Elan Valley Reservoirs, located in mid Wales, provide an important source of supplies to the region.

Many users abstract directly from our rivers including the Severn, Wye and Leam which are regulated to support public water supply abstractions. There are also many smaller farm storage reservoirs throughout the West Midlands that can be refilled during the winter months to provide secure summer irrigation water supplies.

Groundwater is an important resource for direct abstraction for local use by farmers and industry, as well as for public supply. About a quarter of the region is underlain by useable aquifers, notably the widespread Permo-Triassic Sherwood Sandstone and the Old Red Sandstone in Herefordshire.

The West Midlands public water supplies are provided primarily by Severn Trent Water, South Staffordshire Water and Dwr Cymru (Welsh Water). All these water companies use a combination of reservoir, river and groundwater sources, and have well integrated distribution networks (Figure 6). However, new developments should take account of the present limited surplus of supply availability over water demand in the West Midlands, and consider the provision of a sustainable supply of water at the feasibility or planning stage. This will ensure that new needs can be met without detriment to the environment or to the level of service received by customers locally.

Figure 6 Current major transfers and water resource schemes

Future demand for water

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

In the home, we each choose how much water we use. We use water for washing, for bathing, for cooking, to water our gardens, and to wash our cars. In the West Midlands today, on average we each use about 145 litres every day. Future household water use depends on the choices that we make as individuals and collectively as a society. For example, showering usually uses 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. The population of the West Midlands is estimated to grow by less than 100,000 by 2025. While individually the additional households should be more water-efficient, they could 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.

To consider many of these different effects, we have taken a scenario approach to predict future demands. Our forecasts are based on socio-economic scenarios developed as part of the Department of Trade and Industry's Foresight programme. The Foresight scenarios define a broad framework of possible social, economic, political and technological change. They are presented as four different pictures that represent different ways in which our society could change (Figure 7). We have used these scenarios to consider how the demand for water could develop. The scenarios show that demand for water is highly dependent on societal choice and governance. In two of the scenarios, total demand for water rises over the next 25 years, while in the other two it falls. Changes are driven by economic pressures, people's desire to use water in different ways, and technological innovation.

Figure 7 Foresight scenarios

Under the less sustainable scenarios, the amount of water each person uses would grow as people take more for domestic use; for example by installing power showers and garden watering. Taking the growth in population and use together, very large increases in household water demand up to 40% would occur by 2025. On the other hand, if more sustainable water use patterns prevail, the decline in the amount of water each person uses, tighter leakage control and other efficiency gains would more than offset the effect of the larger population. In these circumstances, an overall decline in water use of around 30% would occur in the region over the planning period.

Likewise, if water is used more efficiently by industry and commerce, this could offset the effect of increased economic growth targets for much of the region, as set out in the Regional Economic Strategy of Advantage West Midlands. For example, water savings can be made through waste minimisation clubs, or by environmental accreditation becoming accepted practice for small and medium enterprises. Experience from initiatives carried out to date indicates that it is often feasible to implement water saving measures that repay the investment required in a relatively short time period. Demand changes could range between a 40% decrease and a 33% increase on current levels, according to which scenario is applied.

Spray irrigation demand across the region could decrease by up to 20% by 2025, or increase by 50%. This reflects the different scenario assumptions of customer and supermarket produce quality demands, international competition, crop varieties grown and efficiency of water use.

In practice it is unlikely that society will exclusively adopt one or another of the scenarios. By showing what could occur under each, we have identified boundary limits to guide our resource planning. Clearly, in the relatively dry climate of the West Midlands, it would be particularly challenging to meet the higher forecasts whilst continuing to protect the environment adequately.

Climate change

Climate change is of great significance to water resources. Changes to rainfall patterns and amounts could affect how much water is available for people and for the environment. Climate change could also influence the 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, temperatures are likely to increase, summers could become drier and winters wetter, with more rain in total. Resource systems dependent on summer river flows or river abstractions that are unsupported may become more unreliable. These possible reductions could be offset by increased aquifer recharge and greater reservoir inflows in winter. Many questions remain about the effects of climate change, and it is an area that we will keep under review. We support the 'West Midlands Business Focus on Climate Change' project being undertaken by the Midlands Environmental Business Club and Severn Trent Water. In facing climate change, adaptation strategies are the key, and our recommendations prefer options that are flexible to the range of possibilities encompassed in present climate change scenarios.

Our strategy

Our strategy in Table 1 is designed to improve the environment, while allowing enough water for human uses. In choosing our strategy, we have considered costs and benefits, risks and uncertainties. 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 maintenance of high but stable levels of economic growth and employment. We have also considered the viewpoint of respondents to our formal consultation process. 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.

The Way Forward

Our recommended actions are summarised in Table 2, and are nationally applicable. In many cases, we seek co-operation across sectors and between different organisations. We will work to facilitate such activities.

Future review

We have considered the risks that may arise from following this strategy. Our approach accommodates the range of demands that may arise in the future. It also allows for current scenarios of the effects of climate change. As new scenarios of climate change are developed, we will review the timing of the actions that we propose. It is possible that further investigation could disqualify some of our preferred options. For this reason, we believe that the appropriate studies should be started in good time. Similarly, the demand management options carry some risks. Some may require support or facilitation by Government and regulators, as well as activity from water users; we will review progress.

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

How to find out more

More information on the water resources strategies can be found in:

- Our Agency Region's full water resources strategies and accompanying summary leaflets, obtained from our Regional Environment Agency offices at Solihull and Cardiff.
- Our water resources strategy and summary leaflet for the whole of England and Wales, obtained from our Bristol office.

Further information on all of our water resources activities can be found on the Environment Agency's website at www.environment-agency.gov.uk

Water is a magnet for recreation and relaxation, adding to the quality of life.
River Severn at Bewdley

Table 1 Water Resources Strategy, as applicable to the West Midlands

For the environment, by 2025

- Estimates of reductions in groundwater licences required to achieve sustainable levels of abstraction amount to up to 100 Ml/d regionwide. This will be subject to revision following planned investigation work.

For public water supply, by 2025

Demand management

- We recommend demand management options including leakage control, metering and water efficiency measures including rainwater harvesting. By 2025, we expect to see water savings of up to 140 Ml/d compared to the highest growth scenario, in addition to water savings through maintaining current active leakage control targets.

Resource enhancement and development within the West Midlands

We recognise that there may be a requirement for resource developments of up to 175 Ml/d comprising:

- River Trent: A new River Trent abstraction at Little Haywood above the River Tame confluence sized initially at 20 Ml/d.
- River Severn: Commissioning of Shropshire Groundwater Scheme phases 4 and 5 (currently under development), plus review of the Severn Control Rules. This will give greater reliability to existing River Severn licences in a drought year and increase the previously assessed water availability by up to 100 Ml/d.
- River Leam: Review of prescribed flows and operating rules on the Leam to allow increased abstraction during higher flow periods to boost refill of Draycote Reservoirs to increase yield by up to 5 Ml/d.
- Local sources: Local, mainly groundwater options to meet local needs. Most have been included in water companies' water resources plans. Some additional development of conjunctive use of surface and groundwater including new supply links to partly off-set reduction of groundwater licences. The potential for aquifer artificial recharge and recovery schemes will require further investigation.

For agriculture, by 2025

- Applications for direct river abstractions would be considered. However, reliability in summer would generally be low as abstraction would be restricted during low flow periods.
- There is potential for some further use of groundwater resources where available and conjunctive use of surface and groundwater resources.
- Co-operative use of licences between farmers can make optimum use of scarce resources. Licence trading may enable greater use of existing licensed allocation.
- Winter storage reservoirs will improve irrigation water reliability, particularly in the agricultural areas of the Wye valley, the Shropshire Plain and the Vale of Evesham.
- Promotion of efficient use.

For industry and commerce, by 2025

- Any future increase in demand could largely be met by water use minimisation plus development of new sources where there are local resources available. Water efficiency will be promoted. There is probably scope for some reallocation of existing licences.

Other options under consideration

- River Trent: A larger abstraction at Little Haywood to supply the Staffordshire/Telford zone.
- River Severn: Increased abstraction at existing sites with flow support provided from the following range of options: Shropshire Groundwater Scheme phases 6 & 8, Lake Vyrnwy partial re-deployment or assisted winter re-fill, plus development of bankside reservoirs of Lower Severn in-river storage.
- River Wye: Small increased abstractions from existing river sites. Small groundwater and surface water abstractions, along with enhanced infrastructure to connect isolated areas in rural locations.
- Further integration of water company supply networks and bulk supplies between companies within the region.

Other significant uncertainties

- There is some uncertainty regarding the outcome of the review of the Severn Control Rules. The Habitats Directive review of the Severn Estuary could result in additional environmental needs, bringing forward the need for additional flow support for the River Severn.
- The River Wye is also subject to a review of licences and consents under the Habitats Directive which could affect future resource availability.

Table 2 Actions

Environment

Water is becoming a scarce resource in the West Midlands, and we need to make improvements to the water environment in many places.

- The Agency will work with others to identify the actions needed to improve the water environment.
- The Agency will work to help people understand how water use affects the natural environment.

Water efficiency

Water efficiency will be essential if we are to achieve our vision of sustainable water resource development.

- Ofwat, Government, water companies, trade associations and the Agency should promote water efficiency and monitor results. The Agency will continue to work with water users and water companies to improve water efficiency. Water companies should promote waste minimisation schemes with their industrial and commercial customers.
- Government should ensure that competition and restructuring of the water industry encourage the efficient use of water. Government should ensure that the Water Supply (Water Fittings) Regulations continue to contribute to the efficient use of water.
- The Agency will explore with others the idea of an independent water efficiency body.

Planning

Future developments in the West Midlands should recognise the limited availability of water and incorporate efficiency measures and sustainable drainage systems at the planning stage. The timing and location of new development must respect water resources and environmental constraints. Planners should seek to ensure that development is sustainable, both in terms of water demand (water efficient devices and rainwater harvesting), water abstraction, treatment and supply, and water disposal (sewerage and sustainable urban drainage systems). Water efficiency measures are generally much cheaper to incorporate at the planning stage rather than retrofitting.

- The Agency will work with planners to look for water efficiency in new developments.
- The Agency will work with Government to streamline the approval process for essential schemes while maintaining public accountability.

Public Water Supply

Continued availability of reliable public water supply is essential. Some of this will be achieved through efficiency savings; some through improvements to existing schemes and the way in which they are managed. Some new resource schemes will also be needed. All resource development schemes will need careful investigation by those who will own or benefit from the schemes to ensure that their environmental impacts are acceptable, and that schemes can be promoted at an appropriate time.

- Water companies should continue to develop new and better methods of leakage control, applying best practice techniques. The Agency will seek better access to information on leakage and leakage-control. The system for setting annual leakage targets should be maintained and developed. The Agency will work with Government and Ofwat to ensure that existing and proposed legislation assists in achieving good leakage control.
- The Agency will work with Ofwat to rationalise the way we gather information from the water industry.

- The Agency will work with Government, Ofwat and the water industry to provide information to householders on metering and in the development of tariffs that encourage water efficiency while considering the Government's social and environmental policies. Metering of domestic customers can contribute greatly to sustainable water resources management. Water companies should take a positive attitude towards targeted household metering, where appropriate and where opportunities arise.
- Where possible, water companies should consider sharing water from existing or new developments.

Agriculture

Spray irrigation of crops is an important water use in the West Midlands, but in most agricultural areas little further water is available.

- The Agency will look for opportunities for farmers to benefit from existing and new water resource developments. Farmers should consider working together on shared schemes.
- Farmers should seek ways of minimising their water use. The Agency will work with agriculture to continue to develop indicators of good practice in water use. The Agency will encourage farmers to adopt best practice in water use around the farm.
- The Agency will talk with supermarkets and the food processing industry to help them understand the effects of crop requirements on water use and the water environment.

Industry

- Industry must strive to use available water to best effect, but water saving initiatives will often have a short pay-back period. Existing industry and emerging small and medium enterprises should consider implementing water efficiency as part of a wider environmental management system to reduce water, waste and energy usage. Active promotion of opportunities is essential.

Licence trading

- The Agency will assist trading of abstraction licences, provided that no harm to the environment will result. Farmers should consider the possibility of trading abstraction licences to meet their needs.

Other

- Navigation authorities should investigate the need for reliable water resources.
- The Agency will work with hydropower developers to achieve viable schemes.
- The Agency will encourage the development of water transfers, provided that they take account of the needs of the environment.
- The Agency will work with others on research and development.

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