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# **DRY ROT:** Is England's countryside dying of thirst?

The impacts of droughts and water shortages on England's wildlife



THE NATIONAL TRUST



waterwise



Wildfowl & Wetlands Trust





# **DRY ROT:** **is England's countryside dying of thirst?**

The Impacts of droughts and water shortages on England's Wildlife

P. Burston

July 2006

This summary document can be downloaded from  
[www.rspb.org.uk/waterwetlands](http://www.rspb.org.uk/waterwetlands)

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# Executive summary

Water shortages affect wildlife. Many of our best wildlife sites are already affected by drainage and abstraction. Long spells of hot weather can make this worse, damaging habitats as diverse as moorland and woodland, and threatening the survival of birds, mammals, invertebrates, amphibians and plants.

England was once a land with a huge area of wetlands – these have dwindled under the influence of drainage, pollution and abstraction. Our countryside is drier than ever before.

Climate change predictions suggest that there will be lower summer rainfall in the south and east of England, making droughts more frequent and severe, and putting a further strain on the environment.

We urgently need to change our attitudes to water, and the ways we manage it. With a little effort, we could save huge amounts of this precious resource, which could then remain in the environment to support wildlife. By using water efficiently in our homes, tackling leakage, reversing historical patterns of drainage and reducing pollution, we have the opportunity to give wildlife a fighting chance in a drying world.



Nigel Blake (i.spb-images.com)



Mike Lane (i.spb-images.com)



Imageflow by CIT (www.citdigital.com)

**Wetland wildlife like snakeshead fritillaries, redshank and otter depend on water in the countryside.**



David Ippling (spb-images.com)



Chris Gomersall (spb-images.com)

## Water shortages and the environment

This report highlights threats to the natural environment from drought and water shortages. Our wild places are threatened by poor water management, rising demand for water, climate change and plain ordinary bad luck – drought. English Nature estimate that currently almost 40,000 hectares of our best sites for wildlife are affected by drainage, and another 3,000 by water abstraction. Droughts heighten the effects of these activities, making it difficult for already vulnerable wildlife to survive. And although droughts are a natural phenomenon, they are now set to become much more severe and frequent, because of man-made climate change. Without urgent efforts to manage water more sustainably, the current pressures on wildlife will grow. In this report we illustrate how prolonged water stress can affect the environment, examine why current management is making the situation worse, and propose solutions.

### Trees and woodlands

Prolonged drought quickly dries up soils, denying shallow-rooted trees access to water. The beech woodlands of southern England, particularly those on the thin chalky soils of the Chilterns and North Downs, are prone to extensive drought-related damage. Frequent and prolonged droughts in the future would be likely to lead to a progressive loss of beech woodland from these landscapes.

Drought can also make the heather moorlands of upland England tinder dry. The peat soils that underlie them then become a huge fuel source. If uncontrolled, these fires can devastate thousands of hectares, with underground peat fires raging for weeks. Deeply burnt moorland can take decades to recover. Rare birds like the hen harrier, merlin and dunlin are particularly vulnerable to losing their nests and their habitats.

### Heath and moorland

The lowland heaths of southern and central England include wonderful heather-dominated landscapes in Dorset, Surrey, the Weald and Staffordshire. As drought bites, these habitats and their special wildlife (including the smooth snake, sand lizard and Dartford warbler) become susceptible to fire damage, whether from accident, arson or lightning. Hundreds of hectares of mature heath are regularly damaged in this way, and take many years to recover. Isolated populations of rare reptiles may be totally lost, with little chance of natural recolonisation.

### Drought and blanket bogs

The moorlands of northern and south-west England have a significant cover of peat in the form of blanket bogs. They are home to important populations of breeding birds like golden plover, dunlin and snipe, and plants such as sundews and sphagnum; they also help regulate river flow and lock up carbon dioxide. Prolonged drought dries them out; the peat crumbles and turns to dust and large quantities of carbon dioxide are released into the atmosphere, contributing further to climate change. Water that drains from these damaged bogs is discoloured by peat and laden with sediment, adding millions of pounds to the cost of treating drinking water.

**Woodlands and heathlands can be damaged by prolonged drought.**

## Fish and rivers

As drought diminishes spring flows and rainfall, river flows reduce – drying up headwater streams, backwaters and side channels, and reducing watercourses to lengths of barely linked ponds. Headwater streams change character from permanent to seasonal wetlands. Fish are unable to find suitable habitat to spawn and any young fish are denied the shallow 'nurseries' where they are safer from larger predatory fish. Reduced flows and 'ponding' of the river leads to algal blooms, as pollutants are concentrated – depleting the waters of oxygen and killing fish in large numbers. Without expensive intervention, whole stretches of river can become denuded of fish.

# Case study: the Wylde Catchment – an ecosystem in jeopardy

**Wiltshire's River Wylde, an important tributary of the Hampshire Avon, is an internationally valued chalk stream – particularly notable for its *Ranunculus*-based waterweed community. It is heavily used for public water supply, and has been classified as over-abstracted.**

"The drought years, exacerbated by abstraction, have resulted in the Till (a winterbourne at the top of the system, but historically flowing lower down for the entire year) losing much of its wetted area for spawning and juvenile fish. Once the levels dropped away, we had to rescue the adult trout – 1,350 over 2003 and 2004 – but it was extremely difficult to catch the juveniles, the majority of which were lost completely from the system. One more drought year could see the end of any 'homing' instincts for wild trout, meaning that, even if wetted areas eventually return, the Till's spawning beds will only be re-colonised by wandering fish, so slowing down recovery and making the system even more vulnerable to drought and abstraction."

Peter Hayes, Chairman Wilton Fly Fishing Club

"Another negative effect is the way water temperatures rise quickly in hot weather (up to nearly 20 degrees centigrade recently), due to minimal cold spring water coming into the system. This impacts fish, and also fly life – small up-wings are particularly scarce this year. Also, in winter, spring water, which is warmer than the water already flowing in the river, (10 degrees centigrade) should warm chalk streams, so helping to boost early *Ranunculus* growth; but water temperatures were so low this winter because of lack of flow from the springs, that the weed was slow to establish in spring. Lack of weed leads to reduced food/cover for invertebrates and cover for fish which, coupled with low water levels, leaves trout short of food and vulnerable to predation."

Adrian Simmons, River Keeper for the Wilton Fly Fishing Club



Nicholas and Sherry Lu Aldridge (FLPA)



Martin H Smith (FLPA)

**Chalk streams are some of our most precious and vulnerable wetland habitats, spawning grounds and nurseries for fish like the brown trout.**



Mike Read (rspb-images.com)

**Many birds, including yellow wagtail and black tailed godwits, need moisture on the land to enable them to feed and breed successfully.**

## Drought and birds

Populations of wetland birds, like lapwings, snipe and redshanks, are particularly vulnerable to winter and spring drought, as they need moist soils and water-filled pools, hollows and ditches to breed and feed their young.

Without these conditions, many birds will not settle to breed. Those that do are unlikely successfully to hatch eggs and rear chicks, as they struggle to find food enough even for themselves. Drainage practice which has sought to move winter flood-water off the land as quickly as possible, and keep grasslands dry in the spring and summer, already affects these birds, and is likely to

make their plight worse in the future, as they face more prolonged and frequent droughts.

Lack of water in the farmed countryside has also been implicated in the sharp decline of once common birds like the song thrush, tree sparrow and yellow wagtail. These species need moist soils and rich insect life to feed their chicks. Many of the small, wet areas on farms, including ponds, puddles at field edges, and ditches, have disappeared in recent years. Drought conditions make life for these species even more difficult; without conservation action, these could lead to further population declines and range contractions.



Bob Glover (rspb-images.com)

## Case study: wading birds suffer on Sheppey

The RSPB nature reserve at Elmley Marshes on the Isle of Sheppey in Kent is one of the most important sites in southern England for breeding wading birds. In a typical year, its grazing marshes are home to up to 300 pairs of redshanks and lapwings. In 2005, Elmley recorded its lowest ever rainfall, at 372 mm, and its lowest ever breeding lapwing numbers, 65 pairs. In April 2006,

when water levels should have been at their highest, they were at very low mid-summer levels. Not surprisingly, lapwing numbers plummeted further to 55 pairs. The site wardens are doing all they can to keep the site in optimum condition with cattle and sheep grazing, management of vegetation and manipulation of water levels. But without rain, their efforts will be in vain.



David Broadbent (rspb-images.com)

**Wet grasslands such as those in North Kent are normally havens for England's threatened wetland wildlife.**



Mark Hamblin (rspb-images.com)



David Norton (rspb-images.com)



Dietmar Nill (naturepl.com)

**Invertebrates like this damsel fly, as well as bats and water voles, are all at risk from drought and water shortages.**

## Drought and mammals

Many bat species, like the Daubenton's and the lesser and greater horseshoes, are particularly associated with watery places. They rely on the rich flying insect life associated with rivers, ponds and floodplain wetlands. Drought dries out these habitats, making prey scarce. Rearing young is difficult in these conditions, and adult survival rates are diminished.

When water levels drop in ditches and rivers then the entrances to the burrows of the water vole are no longer underwater. This makes these increasingly rare animals much more vulnerable to predation from mink and heron. Prolonged drought is likely to lead to the loss of isolated populations and a further contraction in the range of a creature that was once the much-loved talisman of England's streams and rivers.

## Drought and insects

Healthy wetlands are host to an abundant and diverse range of insect species – mayflies, damsel and dragonflies are just the most visible and appealing. Pollutants from agriculture and industry have rendered many streams, rivers and ponds devoid of much of this

insect diversity. Drought exacerbates this dire situation by diminishing flows, concentrating pollutants and triggering algal blooms. This reduces the rich diversity of plant life and water depths and flows upon which aquatic insects depend.



David Tipling (rspb-images.com)

## Drought and frogs, toads and newts

Amphibians are totally dependent on freshwater habitats for much of their life cycle. If these are lost or reduced in quality through drought, then amphibians cannot spawn, and when eggs are hatched few tadpoles survive. Particularly susceptible is the natterjack toad, a rare species that relies on the shallow ponds of heathland and sand dune slacks –

just the sort of habitat prone to drying out in drought conditions.

Garden ponds have become very important to amphibians, as the countryside has desiccated. In times of drought, it is important that they are not allowed to dry up – refilling is allowed in areas subject to ‘hose pipe bans’.

## Drought and plant life

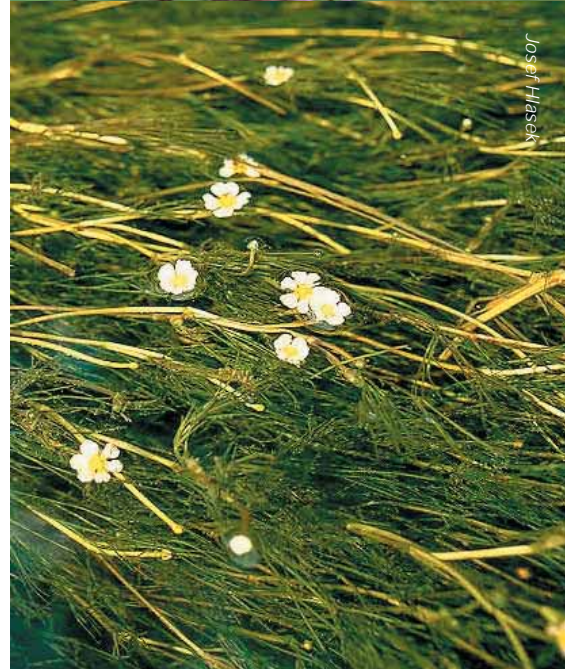
Wet habitats are places of great botanical diversity. Floodplain meadows are a blaze of summer colours, while chalk streams and pollution free lakes host wonderful aquatic plants like stoneworts and water crowfoot. This rich diversity is threatened by the combination of poorer water quality and falling water levels that drought brings. Plant communities are lost as dryland species and those tolerant of pollutants move in and out- compete the special and the rare.

Once lost, this diversity is very hard to regain.

Drought can also badly hit the plant rich grassland that still survives in small pockets of England's chalk downlands. The thin chalk soils are susceptible to rapid drying, scorching plants and diminishing plant flowering and growth. Prolonged drought will begin to threaten these diverse swards with loss and replacement with less diverse scrub and grassland flora.



Steve Austin (i.spb-images.com)



Josef Hasek



Roger Wilmshurst (i.spb-images.com)

**Ragged robin and water crowfoot are special wetland plants, vulnerable to drought. The rare natterjack toad lays its eggs in pond and pools – if they dry up too quickly, its tadpoles cannot survive.**



**The Pripyat River in Belarus – low lying areas of England might once have looked like this.**

# England: a green, wet and pleasant land?

## Naturally wet

The records of archaeologists and historical ecologists tell us that up to a quarter of England was once wetland. Meres, lakes and reedswamps filled flat lowlands like the Fens, while even the smallest river valley was home to mire, marsh or wet woodland. Wetland wildlife was prolific and abundant – beaver were common, pelicans, marsh terns and cranes too. Wet valley grasslands offered good grazing and hay and were favoured places around which villages first formed. Areas rich in wetlands were rich indeed – grazing, fish, fuel, fowl and thatch were in abundance.

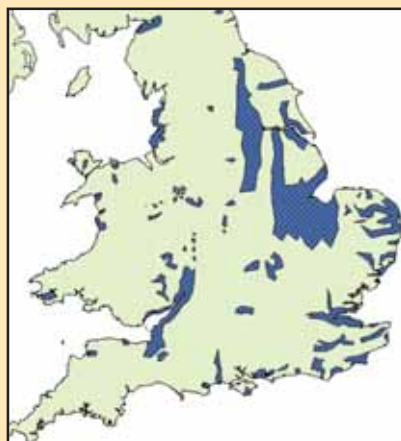
## How wet is England now?

Centuries of agricultural drainage, water abstraction and engineering have turned a land that was once water abundant, into an increasingly desiccated countryside. Most of our meres, mosses and fens are long gone – drained, ploughed and transformed into farmed fields. In East Anglia, the area of fen habitat declined from 3,400 square kilometres in the 1630s to just 10

square kilometres now. Rivers that once meandered according to patterns dictated by rainfall and the land, now run to the sea confined within banks, dredged and straightened. Almost every field is efficiently drained, so that water moves swiftly into streams that are little more than machine-cut ditches. Huge areas of land were drained quite recently, with 20,000 square kilometres of wet grasslands drained between 1940 and 1980 alone. Water coming onto or staying on the land is written about and perceived of as a menace or a nuisance. It is as if we had a collective phobia of water.

At the same time that water is pumped and drained away from agricultural land, billions of litres of water are daily taken out of rivers and groundwaters to supply a growing population, with an ever-expanding need for water. Unsustainable abstractions from groundwater mean that the wetlands and rivers that rely on these underground sources run dry, while many ecologically valuable headwaters have been submerged under reservoirs.

**Figure 1**  
**The historical and current extent of England's wetlands**  
*Source: RSPB*



Then – 17th century



Now – 21st century

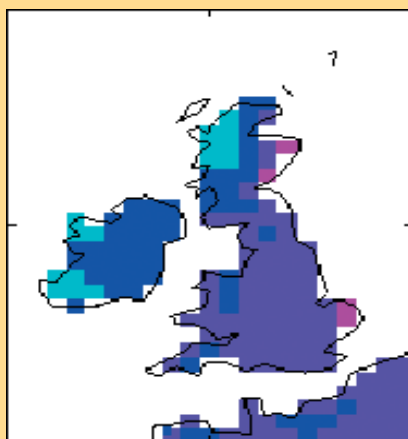
# Climate change – a drier future?

Simulations of our future climate predict that the twenty-first century will see south east England experiencing less rainfall and higher temperatures in summer. Severe droughts, like those experienced in 1976 and 1995, will be more common, occurring in 30 per cent of years by the 2050s. Whilst winter rainfall is also predicted to rise, part of this increase will be associated with more frequent storm events, and is unlikely to offset the environmental impacts of less spring and summer rainfall.

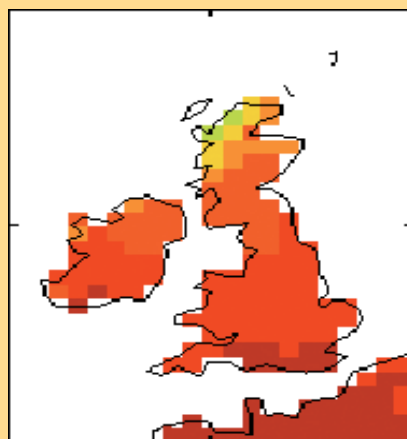
Urgent action is needed to tackle climate change, if we are to keep temperature rises within manageable levels. But even if we limit further, dangerous climate change, we are going to face rising temperatures over the next few decades; and an England that is drier in most summers than it is now. Wetland wildlife that is already beleaguered will struggle to cope, if we do not husband our scarce water resources more carefully.



Niall Benzie (fspb-images.com)

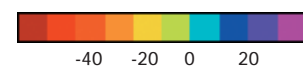


Winter



Summer

**Figure 2**  
**Change in precipitation**  
Medium-high emissions scenario, 2080s  
Source: Hadley Centre for Climate Prediction and Research



# Water madness? – STOP!

Frequent and prolonged water shortages can devastate wildlife. The way we manage water now is making the situation worse, by squandering water which could otherwise keep our countryside healthy. Our wildlife cannot afford more of this water madness.

## ✘ Leaking it ...

We currently lose 15% of all the water taken from the environment through leakage.

Action and investment is urgently needed to address this problem.

## ✘ Pumping it ...

During the winter, millions of litres of water are pumped from agricultural land in England. The South Holland Internal Drainage Board, draining just 25,277 hectares of the Fens, is capable of pumping 3,024 million litres of water every day. If only a part of this water were retained on the land, it could support wetlands, recharge aquifers, and provide for irrigation. The Government recognises that over half a million hectares of agricultural land are defended and pump drained for no overall economic benefit<sup>1</sup>. The great irony is that these areas suffer from lack of water in the summer months, too.

## ✘ Wasting it ...

We each use an average of 154 litres of water per day, a figure that rose by almost 11% between 2000 and 2005. Water hungry devices like Jacuzzis, swimming pools and power showers are increasingly popular. Meanwhile, new housing proposals could lead

to an extra demand of 1,705 million litres per day if houses are not built in a water-efficient way.

## ✘ Polluting it ...

Pollution by nitrates and pesticides from agricultural run-off threatens our groundwater reserves. Studies suggest that up to 1,500 million litres per day of supply may be at risk. Water companies close down boreholes, treat the water or blend contaminated water with purer sources to maintain supply. Hundreds of millions of pounds is spent every year removing these pollutants from water.

## ✘ And then looking around for more? ...

In drought years, demand for water can exceed supply. In some parts of England, the system cannot cope. This problem could be reduced significantly, if we used water more efficiently in our homes and businesses; but all too often, we look to take more water from the environment, before conserving what we have. Water company plans propose new reservoirs, desalination plants, and further abstractions. It may be that we will need some of these solutions in the future, but all have the potential to damage

the environment, and are costly and energy-hungry. It makes no sense to treat them as first rather than last choices, ahead of increased water efficiency and reduced leakage.

Even more worrying, are calls for a 'national water grid', to allow water to be transferred from the wetter to the drier parts of the UK. Such a project would be hugely expensive - far more expensive than water efficiency measures in homes and businesses, which would do the same job, and keep our taps running. Nor is it accurate to suggest that there is a surplus of water in the north and west of the UK. In drought years, these areas often struggle to supply themselves, let alone provide water for the rest of the country. They also contain many sensitive and valuable wetlands, which could be seriously damaged by attempts to divert their water supply into pipes or canals. A water grid is water madness, not water wisdom – and would cost customers and wildlife dear.

<sup>1</sup> Making Space for Water: Developing a new Government strategy for flood and coastal erosion risk management. Department for the Environment, Food and Rural Affairs, 2004



# Water wisdom – GO!

**We don't have to treat our water resources so carelessly – there are other, wiser ways to keep England's waters flowing, and to help wildlife and people overcome the challenge of drought.**

## ✓ Save it ...

Water is a scarce and valuable resource. We must use it wisely, reusing and recycling it where appropriate. Rising household demand could be stemmed by building new houses to exacting water efficiency standards (using 40–60% less mains water than current housing) and replacing thirsty and inefficient fittings in existing homes. Well designed charging schemes would discourage profligate use, and allow customers to see what they are using, through a metered supply. An education campaign, combined with labelling of products and housing to show how much water they use, would help to change behaviour.

## ✓ Plug the leaks ...

We must invest more now in the water distribution system, to combat leakage. Tougher leakage targets for water companies would drive faster action and reflect the true cost of taking more water from the environment. Reclaiming the water that is currently lost to leakage could provide us with the equivalent of ten reservoirs the size of Grafham Water.

## ✓ Close the sluice gates ...

We should look again at our system for draining water from the land, in some cases turning the pumps off altogether, and closing those sluice gates. Allowing wetlands to become wet again would help to safeguard aquifers and provide secure, drought-resistant and climate change proof homes for wildlife.

## ✓ Stop polluting ...

The hundreds of millions of pounds spent every year to strip pesticides and fertilisers out of drinking water hugely outweigh the meagre sums of money available to farmers to help them farm in more water sensitive ways. Redirecting even a portion of those funds would enable the transformation of land management in affected catchments. Controlling pollution at source by, for example, switching to organic cultivation, managing grasslands extensively, and creating a system of wide buffer habitats and wetlands, would safeguard drinking waters and provide a great boost to biodiversity and landscape quality.

**'Make the wrong choices now and future generations will live with a changed climate, depleted resources and without the green space and biodiversity that contribute both to our standard of living and our quality of life. Each of us needs to make the right choices to secure a future that is fairer, where we can all live within our environmental limits. That means sustainable development.'**

**Tony Blair**, foreword to 'Securing the Future' – The UK Government Sustainable Development Strategy (March 2005)

**If Government takes these steps to water wisdom, they will help to fulfil their commitment to creating a society that lives within environmental limits.**



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Mark Hamblin (rspb-images.com)



istockphoto.com

## How you can help:

Use water wisely in the home and garden. Take measures to reduce water consumption. Below is a list of water saving tips and ideas. Please visit [www.waterwise.org.uk](http://www.waterwise.org.uk) for more information.

- Fitting a Save-a-flush (a bag of harmless crystals) in your toilet cistern can save up to one litre per flush. That's a saving of nearly 2,000 litres per person per year.
- Installing a Hippo (designed to work in toilet cisterns with a nine-litre flush or greater) could save up to 5,000 litres per person per year.
- Turn off the tap when brushing your teeth. Brushing your teeth with the tap running wastes six litres per minute.
- Fix leaking taps. A dripping tap can waste up to 140 litres a week.
- When buying a new dishwasher, choose one that is energy efficient as this saves on water and electricity. Machines with an 'A' rating are most economical.
- Wait for a full load before using the washing machine – a full load uses less water than two half loads.
- Cool water in the fridge means you don't have to run the tap for ages to get a cold drink.
- Only fill the kettle with enough water for your needs, this will reduce your fuel bills too.
- Lag your pipes and leave your heating on a low setting when you are out to avoid bursts in cold weather.
- A water butt in your garden can collect rainwater that can be used on your plants and lawn.
- If you have a water meter, check for leaks by turning off the water and taking two readings several minutes apart. If the readings are different, there may be a leak.

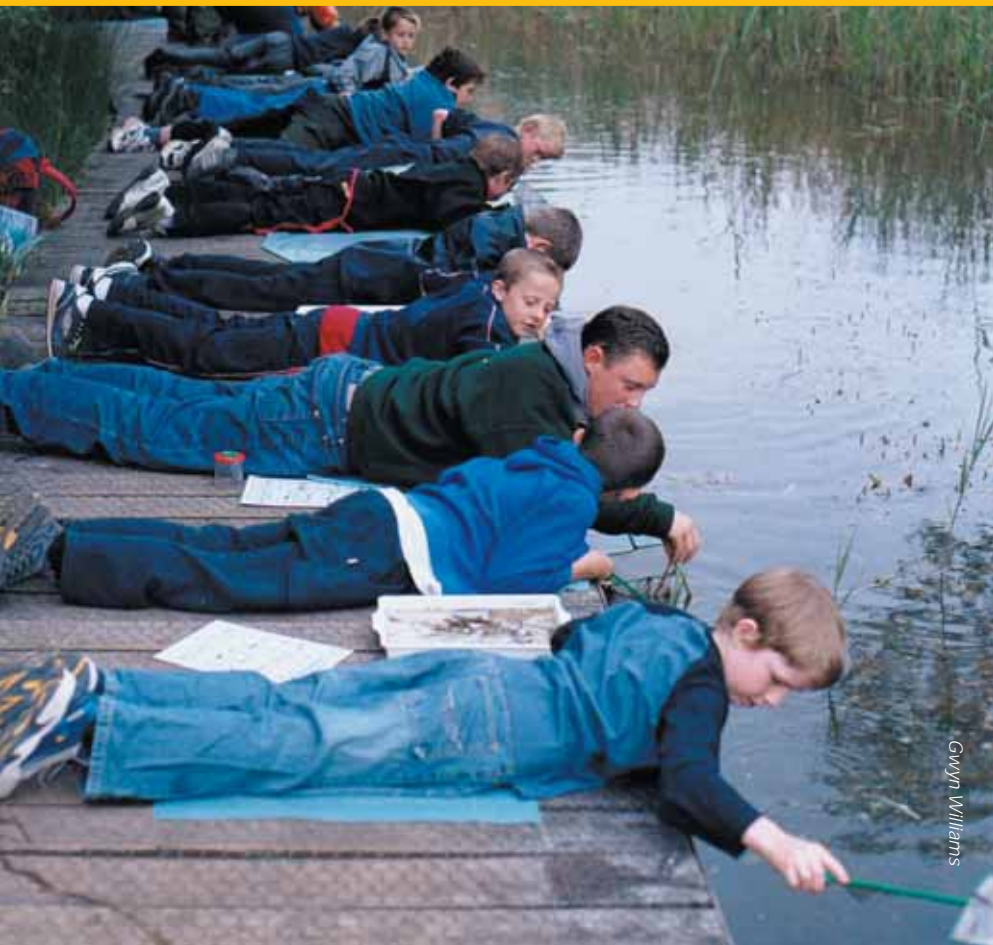
These groups and organisations can help with advice on how to save water:

<http://www.waterwise.org.uk>

<http://www.envirowise.gov.uk>

<http://www2.watervoice.org.uk>

<http://www.environment-agency.gov.uk>



Cubs pond-dipping at  
RSPB Fowlmere Nature Reserve,  
a spring-fed reedbed, June 2004

Gwyn Williams



The same scene in drought  
conditions, July 2006

Gwyn Williams



**The Royal Society for the Protection of Birds**

The Lodge, Sandy, Bedfordshire SG19 2DL

[www.rspb.org.uk](http://www.rspb.org.uk)

Registered charity no 207076



**Anglers Conservation Association**

Eastwood House, 6 Rainbow Street, Leominster, Herefordshire, HR6 8DO.

[www.a-c-a.org](http://www.a-c-a.org)

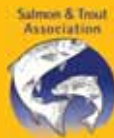


**National Trust**

Heelis, Kemble Drive, Swindon SN2 2NA

[www.nationaltrust.org.uk](http://www.nationaltrust.org.uk)

Registered charity no 205846



**Salmon & Trout Association**

Fishmongers' Hall, London Bridge, London EC4R 9EL

[www.salmon-trout.org](http://www.salmon-trout.org)



**Waterwise**

1 Queen Anne's Gate, London SW1H 9BT

[www.waterwise.org.uk](http://www.waterwise.org.uk)

Registered charity no 5546669



**The Wildlife Trusts**

The Kiln, Waterside, Mather Road, Newark, Nottinghamshire NG24 1WT

[www.wildlifetrusts.org](http://www.wildlifetrusts.org)

Registered charity no 207238



**WWF – UK,**

Panda House, Weyside Park, Godalming, Surrey GU7 1XR

[www.wwf.org.uk](http://www.wwf.org.uk)

Registered charity no 1081247



**Wildfowl & Wetlands Trust**

Slimbridge, Gloucestershire GL2 7BT

[www.wwt.org.uk](http://www.wwt.org.uk)

Registered charity no 1030884