Chalk Rivers & Streams

Sussex Wildlife Trust

Why are chalk rivers and streams important?

One of our rarest native mammals the water vole, is often found living on chalk rivers. Stable water levels and lush, green plant growth provides ideal conditions for them © P Stevens

England has most of the chalk rivers in Europe. There are only 35 chalk rivers between 20 and 90 km long in the UK. They are mostly found in south and east England - from Dorset to Humberside. Chalk geology is rare worldwide. The Sussex chalk rivers and streams are therefore of global importance.

All chalk rivers are fed from natural underground aquifers meaning they have clean, clear water and stable water temperatures. These unique conditions, along with their alkaline chalk geology, support a rich diversity of wildlife including important fish populations such as brown trout, native crayfish and many other specialist species. Their rarity means that many chalk rivers in the UK have been designated as Special Sites of Scientific Interest (SSSIs).

What is a chalk river?

A chalk river or stream is a watercourse which flows across chalk bedrock, and/or is influenced by local chalk geology. Chalk rivers are usually fed by underground or seasonal springs flowing from chalk and often have 'winterbourne' stretches in their headwaters which run dry, or partially dry in late summer to the spring.

What is the difference between a chalk river and a chalk stream?

Chalk rivers and streams are recognised as a priority habitat under the UK Biodiversity Action Plan (BAP), and general descriptions of what constitutes such habitat are given in 'The State of England's Chalk Rivers' (EA & EN; 2004) and 'Chalk Rivers – Nature Conservation and Management' (EA & EN; 1999). Sites are generally considered to be 'streams' rather than 'rivers' when they are no further than 5km from their source or greater than 5m wide (unless they have been artificially widened).

Chalk rivers

The larger chalk rivers are often more exposed to light and therefore have characteristic plants such as river water crowfoot and watercress in them. Some examples such as the Mole in Hampshire have low banks and shallow, clear flowing water which supports a range of water-loving plants. Sometimes you may be able to see the chalk bedrock on the bottom of the river or beds of gravels along the stream bottom. Many chalk rivers have however been artificially widened, straightened and deepened.

Sussex chalk streams

South Downs chalk streams are different from classic chalk rivers such as Hampshire's river Itchen. Each chalk stream has its source much higher in the hills, and the gradient of the streams are very steep. The South Downs chalk streams have therefore been classified as a distinct type.

Sussex chalk streams often occur in small gulleys which are more wooded than other chalk rivers and streams. This results in unusual features including:

- mini chalk waterfalls which form when chalk water upwellings 'calcify' in the air
- dense shade which means that there is naturally less vegetation cover
- typical chalk river plants like Water Crowfoot are often absent – which is more natural
- stream channels are diverse because of natural flow restrictions such as tree roots
- woody debris is common in the channel and it influences the stream flow
- the substrate (stream bed) is less frequently made up of flints and mobile gravels

How do I know if I have a chalk stream on my land?

If you live within the South Downs National Park and your stream runs across the chalk, then it is highly possible you have a chalk watercourse. Take a look at the pictures in this leaflet which may help show you what a chalk stream looks like. Alternatively contact www.sxbrc.org.uk or info@sxbrc.org.uk who can supply you with maps of protected or rare species and habitats on your land.

Sussex chalk streams have a unique character, with steeply sloping, fast flowing streams associated with ancient woodland and woody debris reminiscent of northern UK streams. One of the most natural examples of a chalk spring head in the UK is also found in Sussex. We also have 'Knuckerholes' which are thought to be holes which go directly into the aquifer.

A chalk 'waterfall' or Tufa deposit © N Holmes

A very rare and pristine wooded chalk spring head in East Sussex © F Southgate

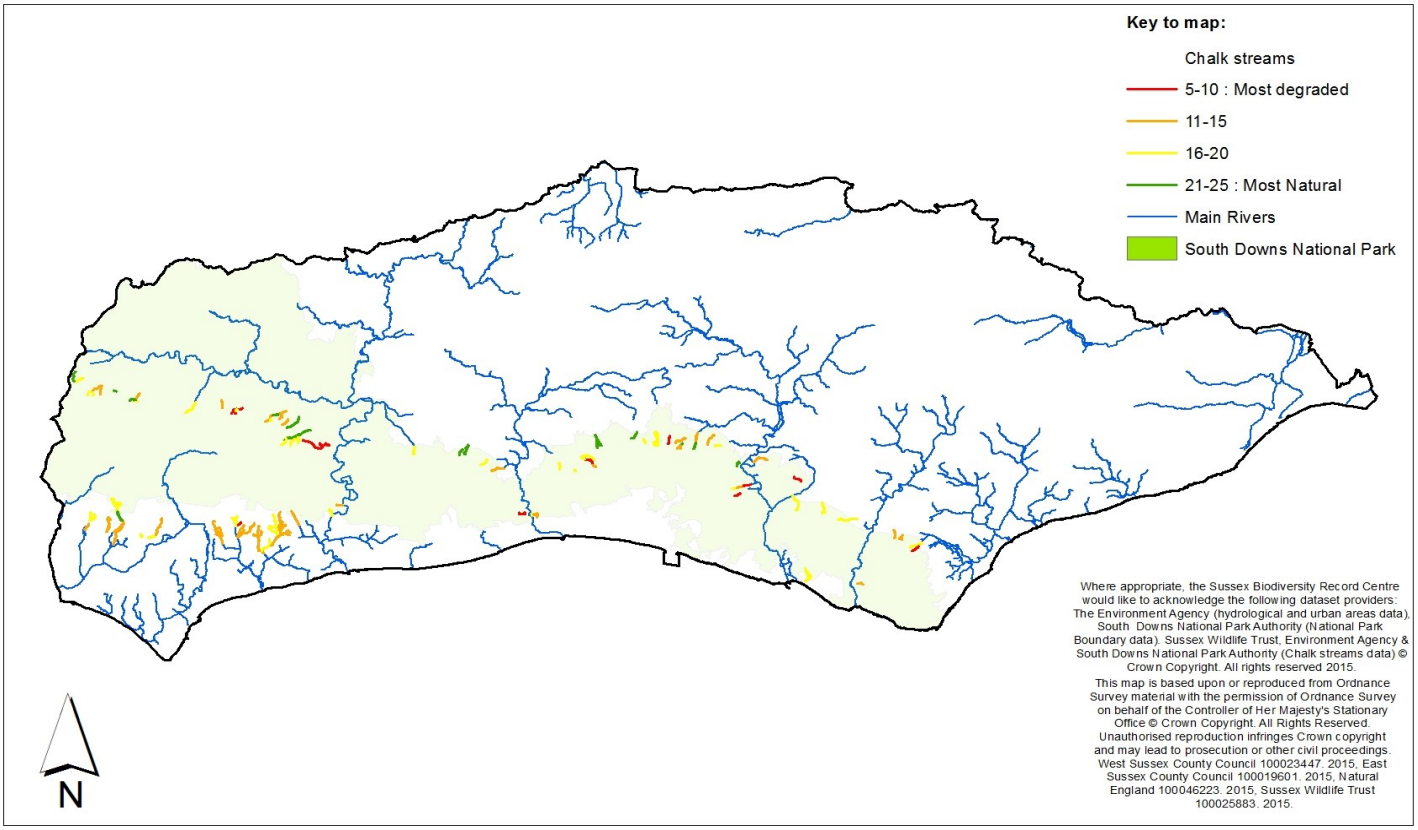
A typical Sussex chalk stream with meanders and woody shade © F Southgate

A West Sussex Chalk Stream © N Holmes

Where are the chalk streams and rivers in Sussex?

In Sussex we have three designated chalk rivers – The Ems and Lavant in West Sussex and the Lewes Winterbourne in East Sussex. We also have over 140 km of chalk streams spread throughout the South Downs National Park, many of which are more natural than the legally designated larger chalk rivers. The map below shows the location of all the confirmed Sussex chalk streams in 2011.

Sussex Chalk Streams



What other interesting features might I find on my chalk stream?

A derelict watercress bed in West Sussex © Fran Southgate

Mills and mill ponds

On the flowing (perennial) chalk streams in Sussex, mills were often built. Many of these mills are now derelict. Associated mill ponds have often developed into swampy habitats into which chalk water flows. These chalk habitats are of high nature conservation interest and their restoration to a ponded habitat could be considered environmental degradation. It may be desirable to retain mill structures as historic features, where they do not impede fish migration.

Watercress beds

The pure flows of perennial chalk streams made them ideal locations for watercress farms. In Sussex there are a few locations where historic and modern cress farms can be found on chalk streams.

What wildlife is characteristic of Sussex chalk streams?

Some of the characteristic plants you would expect to find in chalk Winterbournes **are**:

Water-cress (*Rorippa nasturtium-aquaticum*), Fool's water-cress (*Apium nodiflorum*), Water speedwell (*Veronica anagallis-aquatica/catenata*) & Sweet-grass (*Glyceria sp*(p.)

Some plants you might expect to find in Perennial chalk streams are:

Blunt-fruited water-starwort (*Callitriche obtusangula*), Lesser water-parsnip (*Berula erecta*), Brook water crowfoot (*Ranunculus penicillatus subsp. pseudofluitans*). *Catabrosa aquatica* (whorl-grass) is associated with shallow, trampled, silty edges of perennial chalk streams. *Hildenbrandia rivularis*, a red encrusting alga, the moss *Cratoneuron filicinum*, and the liverwort *Pellia endiviifolia* are also a sign of strong springs.

Opposite-leaved pondweed (*Groenlandia densa*) and Mare's-tail (*Hippurus vulgaris*) are typical of chalk streams, but much less widespread than other plants.

A number of unusual liverworts and mosses are associated with chalk streams. These include the moss *Hygroamblystegium fluviatile / tenax* and the liverworts *Leptodictium riparium*, *Fissidens spp.* & *Platyhypnidium riparioides*.

Most chalk streams and springs have a unique community of aquatic insects and invertebrates, associated with the chalky water and the unusual gravels, woody debris and tufa features. Where chalk streams are not obstructed by weirs and sluices, their clear flowing water creates extremely good habitat for fish such as brown trout (*Salmo trutta*).

Chalk stream with mosses and fool's water cress © N Holmes

Chalk stream with gravels and submerged plants © N Holmes

Brown trout – one of the species which benefits from the presence of healthy natural chalk streams

Ditched and re-inforced chalk stream © N Holmes

Defunct weir © N Holmes

Urbanised chalk stream © N Holmes

Parrotsfeather smothering a chalk pond
© F Southgate

Problems with Sussex chalk streams

Ditching & Removal of Natural Features

One of the main factors which has caused the loss of a number of our rare chalk streams is that they have been straightened and ditched for drainage purposes, or they have been 'tidied up' and their natural features such as the woody debris dams have been removed.

Weirs and man-made obstructions

Many chalk streams have had weirs and other artificial structures installed in the channel. These structures stop the natural flow of the stream from creating stream features, they slow water flow, encourage siltation of gravels and prevent migratory fish from passing upstream. Many weirs and structures served a historical purpose but are now defunct. Consult with a local Environment Agency Fisheries and Biodiversity team to see if you can remove / bypass your weir.

Urbanisation

Where streams pass through urban areas they have often had natural features removed and have been turned into urban drains with man-made stream banks. Some streams are 'gardenised' and planted with non native plants, with their banks mown or used as compost heaps. Chalk streams can be a huge asset to urban areas. They rarely experience flood flows but they are often 'forgotten gems' which receive pollution and run off from urban drainage.

Non Native Invasive Species

Until recently, garden centres were allowed to sell invasive wetland plants which are not native to the UK. Unfortunately, a large number of these plants such as Crassula and Parrots feather have found their way into rivers and wetlands. They often outcompete native plants, and once present are extremely difficult to remove.

Abstraction

Unfortunately, the over-abstraction of water from underground reservoirs for drinking water and for irrigation of crops and gardens can result in the natural springs running dry in seasons when they should still be flowing.

Pollution

Because their water sources are so pure any agricultural or urban pollution can severely disrupt the ecology of the stream.

How can I manage my chalk stream in a more wildlife-friendly way?

Unless you have invasive species present or man made modifications, one of the best things you can do with a Sussex chalk stream is nothing. By not managing the stream you are allowing it to slowly recover its natural character and features. There may however be a few things you can do to help 'kick start' natural recovery or to prevent and reverse damage to your chalk stream. These include:-

- **Removing obstructions and artificial banks.**
  If you notice any concrete or artificial structures which are no longer useful seek advice from the Environment Agency or the contacts below to get help to remove or bypass them
- **Establishing buffer strips**
  By allowing a vegetated (grassy or woody) margin of 5 – 20 metres between your garden/arable field/livestock and your stream, you are helping to stop soil and pollution running off into streams, as well as providing valuable wildlife corridors for a number of rare species.
- **Having a wildlife survey**
  Contact the Biodiversity Records Centre below to see if they have any information about your stream. If not, ask them who can do a survey to look at the wildlife interest in the stream.
- **Retain natural features**
  Leave fallen trees or wood in the stream. These provide valuable wildlife features and will help the stream re-naturalise itself. If banks slump, let them, and if islands or gravel bars form, leave them.
- **Don't de-silt**
  If you think your stream is too silty, then it is usually better to 'narrow' the stream with willow and hazel spilling and woody flow deflectors which help the river speed up and naturally cleanse itself of silt, as well as helping to create more natural bankside features.
- **Seasonal fencing**.
  If you have livestock which graze to the edge of your chalk stream, or poach down the edges, consider putting in seasonal fencing to limit the removal of wetland plants and bank erosion. In open grassland however, some seasonal low level grazing and poaching can be beneficial.
- **Restore your chalk stream to its natural glory**
  Seek advice from local experts such as Sussex Wildlife Trust or the Wild Trout Trust who may be able to help you restore and re-naturalise the old course of your chalk stream
- **Remove non native plants.** Be careful though, as they can spread very easily.
- **Tell us about new chalk streams.** There may be a few we've missed!

Chalk stream with winter flows © N Holmes

Other things that can be done to help chalk streams:-

- Re-create riffles
- Faggoting of river banks to restore normal flows
- Encourage a two stage channel with wet margins
- Strategically place flow deflectors such as logs to help restore channel meanders
- Restore Ranunculus beds
- Restore native and natural fish populations and fish breeding habitat
- Install temporary and permanent fencing to help prevent stock poaching
- Reduce bankside mowing and in-channel weed cutting

Coir fibre rolls and hazel faggots can be used to help re-narrow streams to increase water flows and restore bankside habitat

Helping chalk streams from the home or farm

If you live in or near the South Downs, or know of a chalk stream on your land or in your local area there are a few things you can do which might help.

• **Reduce water use at home.** The less water you use, the less water needs to be abstracted from the chalk aquifers – the source of water for chalk streams. (see also, 'How to help wetland wildlife from home' advice sheet)

• **Reduce water use on the farm**. If you have a farm abstraction licence, try to use water more wisely by watering crops at the end of the day, installing a farm reservoir (often you can get grant support for this), and only using as much water as you need.

• **Get advice.** Your local Wildlife Trust, South Downs National Park or Natural England representative can put you in touch with someone who can advise you on what you can do to restore and enhance your chalk stream. Try calling Wildcall on 01273 494777.

• **Don't pour chemicals down the drain.** By helping to keep the water draining from your house and farm clean, you are helping to prevent damaging chemicals enter into watercourses

PLEASE NOTE: All river work within 8m of a main river channel needs consent from the Environment Agency (EA). If your chalk river has been designated a Site of Special Scientific Interest then you may need consent from Natural England to carry out restoration work on your chalk stream. For more information see contacts and further reading overleaf.

Contacts

Sussex Wildlife Trust (Wetlands Project)
www.sussexwildlifetrust.org.uk
01273 497555

Natural England
0845 600 3078
enquiries.southeast@naturalengland.org.uk

Sussex Biodiversity Record Centre
01273 497521
www.sxbrc.org.uk

Wild Trout Trust
www.wildtrout.org

Environment Agency
Ask for Fisheries & Biodiversity or
Land Drainage consent teams
03708 506506
www.environment-agency.gov.uk

South Downs National Park Authority
www.southdowns.gov.uk
0300 303 1053

Wildcall Wildlife Advice Line
01273 494777
www.sussexwildlifetrust.org.uk/discover/wildlife-advice

References & Further Reading

- **DEFRA:** The State of England Chalk Rivers— adlib.everysite.co.uk/adlib/defra/content
- **English Nature(1999):** Chalk Rivers; Nature Conservation and Management
- **Natural England:** Water Cress growing and it's environmental impacts- publications.naturalengland.org.uk/file/76003
- **Habitat Action Plan:** Chalk Rivers - http://jncc.defra.gov.uk/page-5706
- **N Holmes:** An Investigation of the Watercourses in Sussex arising from the Chalk Aquifer of the South Downs. Report 1 January 2009 and Report 2 December 2010
- **South downs National Parks Authority:** River Valleys- www.southdowns.gov.uk/looking-after/landscape/river-valleys

Sussex wetlands project promotes the sustainable management of rivers and the restoration of wetland habitats for people and wildlife