

Broads rivers - introduction



Everywhere in the Broads National Park you are close to water. The land is threaded through with streams, rivers and drainage dykes, and dotted with the broads (lakes), which give the park its name. Seven rivers and more than 60 broads lie in the valleys and give boat users more than 125 miles (200km) of waterway to explore.

The Broads is unique in the UK as a linked system of (mainly navigable) rivers and lakes, globally important for its wildlife, and making a huge contribution to the lives of local people and visitors.

Where they are

The three main rivers of the Broads are the **Bure**, **Yare** and **Waveney**. The Bure has two tributaries: the **Ant** and the **Thurne**. The Yare also has two: the **Wensum** and the **Chet**. The Wensum rises in north-west Norfolk (west of Fakenham) and the Thurne starts only two miles from the North Norfolk coast (near West Somerton), but all the rivers join together to flow out to sea at Great Yarmouth.

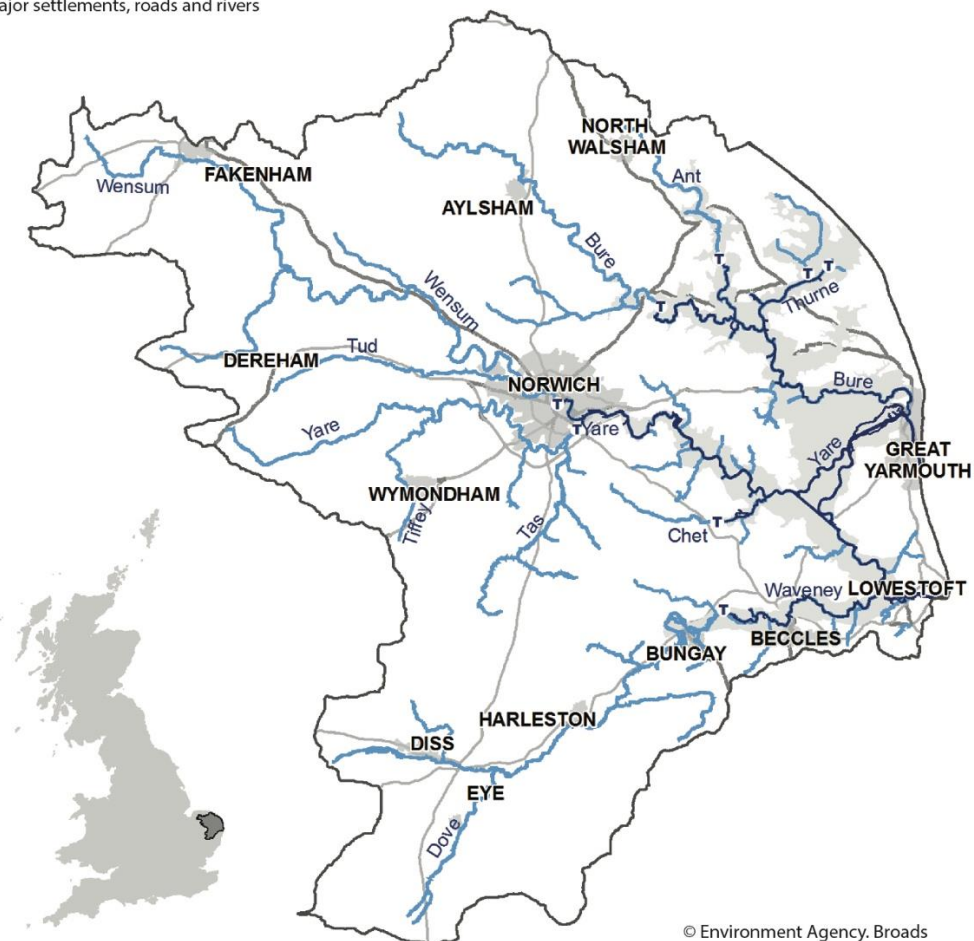


Broads catchment

The Broadland rivers catchment (the area that feeds water into the Broads) is:

- relatively large (3,200km²)
- mostly rural
- includes around two-thirds of Norfolk and part of north Suffolk
- has
 - a strong farming tradition,
 - internationally important wildlife,
 - excellent opportunities for angling,
 - extensive inland navigation,
 - impressive landscapes and coast, historic towns and villages, and the city of Norwich.

Map 1 Location of the catchment, tidal limits, major settlements, roads and rivers



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The rivers and broads in the Broads National Park are low-lying and at the lower reaches of the catchment, so they are affected by what happens upstream as well as by tidal surges from the North Sea. Water that falls in the catchment seeps into the groundwater, or runs, drains or is pumped into the rivers. It finally flows out to sea at Great Yarmouth.

See *'The Broads water cycle'* for more.

People in the catchment

- Around 850,000 people live permanently in the catchment.
- In 2015 there were over 7 million visitors to the Broads.
- Tourism, farming and food processing are the main 'industries'.

Water quality

A century ago, the broads were crystal clear and rich in wildlife. Since that time more people and boats are using the waterways and different ways of farming have made big changes. This has brought high levels of harmful nutrients and pollutants. The Broads Authority and its partners are working hard to restore cleaner water.

Water supply and treatment

Water from the rivers, broads and groundwater in the catchment is treated and used for drinking water. For example, treated water from the Trinity Broads supplies the taps of people in Great Yarmouth and local villages. Most public sewage treatment works put waste water back into rivers, after treatment, but some put it out into the sea. There are several large industrial waste water treatment systems and many private sewage treatment works, including septic tanks, which discharge into rivers or into the ground.

Land use in the catchment

- Farming and other land management have a major influence on [landscape](#) and tourism within the catchment
- Arable farming – about 80% of the land
- Much of the land is high grade and crop yields are high compared with the national average
- Grazing meadows and semi-natural fens in river valleys and around the broads
- In the south and west there is more intensive livestock production
- Land drainage over wide areas improves agricultural production
- Thirty-six pumps and 746km of watercourses are cared for in the Broads area and river valleys
- Flood risk management (including embankments, walls and flow-regulating structures) reduces flood risk to agricultural land, infrastructure and properties, and over 30,000 people
- Woodland, scrub and heath occur in small, scattered areas

Much of the material in this section is derived from the Broadland Rivers Catchment Plan 2014.

Parts of a Broads river

A typical Broads river does not behave like a classic river starting from a steep, hilly upper course with waterfalls and speedy flows. In Norfolk and Suffolk's relatively flat landscape the source of a typical Broads river may be an area of soggy land with no observable slope. The water seeps into drainage ditches and it may take several hundred metres before there is a recognisable main channel with some sort of flow.

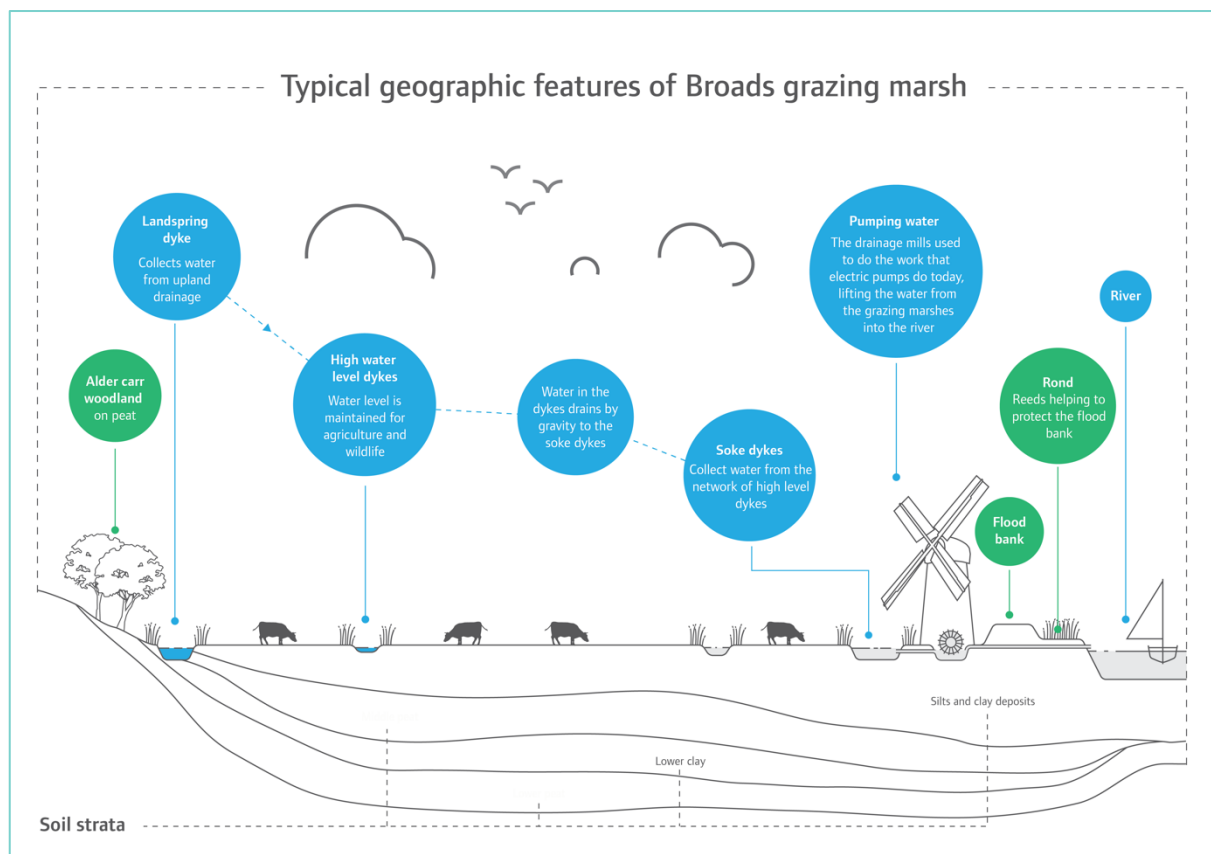
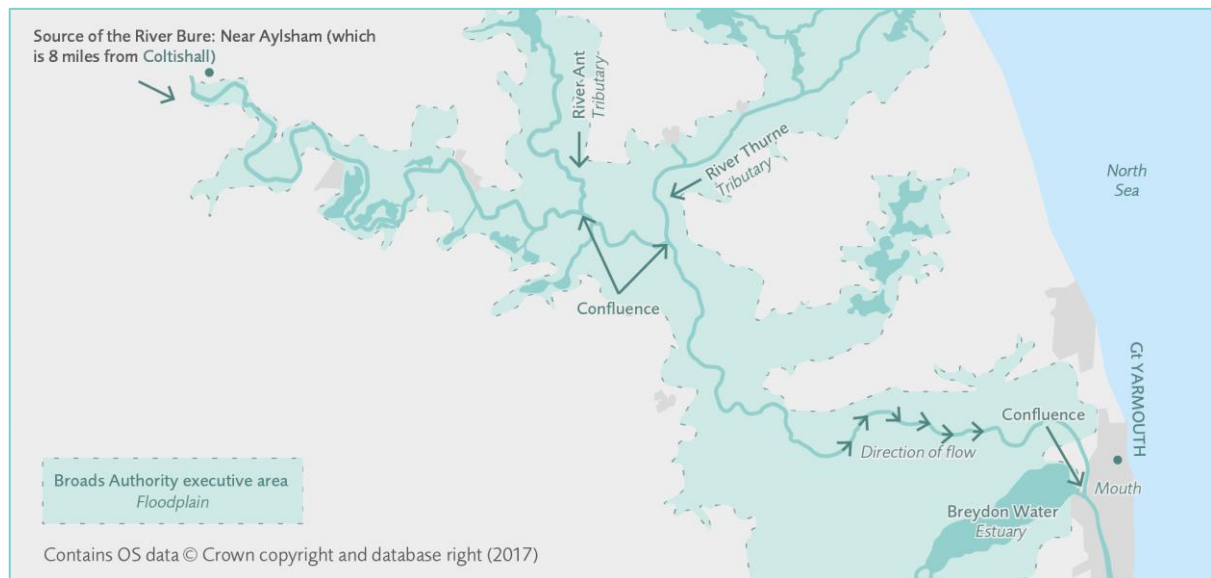
Broads rivers demonstrate well the middle and lower courses of a classic river, as they flow through their valleys, with gentle gradients, meanders and evidence of erosion and deposition.

In the lower courses, with their deeper, wider channels, the rivers flow through a flat landscape of floodplains. In many places there are embankments to prevent flooding and pumps to lift the water from drainage dykes into the main channel. Much of the Broads area is at or below sea level. Many of the rivers are tidal, and with rising sea levels, salt water from the sea can flow upriver and damage the freshwater environment.

Example – the River Bure

Annotated map of **the Bure** showing:

- **source** (near Aylsham)
- **mouth** – (Great Yarmouth)
- **direction of flow**
- **tributaries** Ant and Thurne
- **confluence** points
- **floodplain**
- **tidal section** of river
- **estuary**
- **sea**



Activities

- Explore a typical Broads river by **watching the video** 'Journey through the Broads National Park' www.broads-authority.gov.uk/about-the-broads/journey. Work in groups – each taking one **Broads river to research**. Think up interesting questions. Come back and present the findings.
- Do a **river study walk/trip** – either along a river or down the valley to the river, taking measurements and photographs; making observations and field sketches. Make a cross-section drawing of your valley. Present the findings to the school/pupils' parents.
- Research the **history of your local river's course**, from old maps, photographs and perhaps interviewing people who have lived in the area a long time. What can you find out about the changes your river has seen? Make a display/presentation/book.
- Make an **annotated model** of your local river from its source to the sea, or a Broads river – or the whole Broads catchment, simplified.
- Create a **map/leaflet/video to guide** other young people on a walk from your school to the river, or along a stretch of river. What do they need and want to know?
- Create and share an **annotated online map** – using ESRI software (or another mapping programme) to add all the river-related details discovered (data, photos and historical facts). Add links to Arcview Storymaps.
- **Challenge** - can you find an example of a waterfall in the Broads?
- Find out what the **major land uses** are in your local area.
- **People's use of the rivers and broads** - research within the school community who has links to the Broads. Present findings on an online map (ESRI or other), suitably anonymised.
- **Explore the region's landscape remotely** through maps and photos using www.landscape-east.org.uk for example.

Glossary

- **Broad** – a lake in this area – most of them were originally dug to get peat for fuel
- **Confluence** – where a tributary meets another river
- **Deposition** – the process by which material being carried by a river (silt/sand) is dropped
- **Downstream** – the direction in which a river flows from its source to its mouth
- **Dyke** – a ditch, dug to drain the surrounding land
- **Erosion** – when the flow of water wears something away – for example a riverbank
- **Estuary** – the mouth of a river, often a coastal waterbody, into which rivers or streams flow, influenced by both fresh water from the rivers and salt water from the sea
- **Floodplain** – the area on to which a river floods, usually in its lower course
- **Main channel** – the main river flowing through and draining an area
- **Meander** – a natural bend in the river
- **River** – a body of water that flows towards the sea
- **River catchment** – all the rivers, streams and lakes within one area, which drain into the sea through the same river mouth
- **River mouth** – the end of a river, often where it reaches the coast and drains into the sea
- **River source** – where a river starts, in most cases a spring, but some rivers start as lakes or reservoirs
- **Tributary** – a smaller river, or stream, which flows into a larger river
- **Upstream** – moving against the flow of a river from lower to higher land, towards the source
- **Watershed** – the boundary between the catchment area of one river and the next