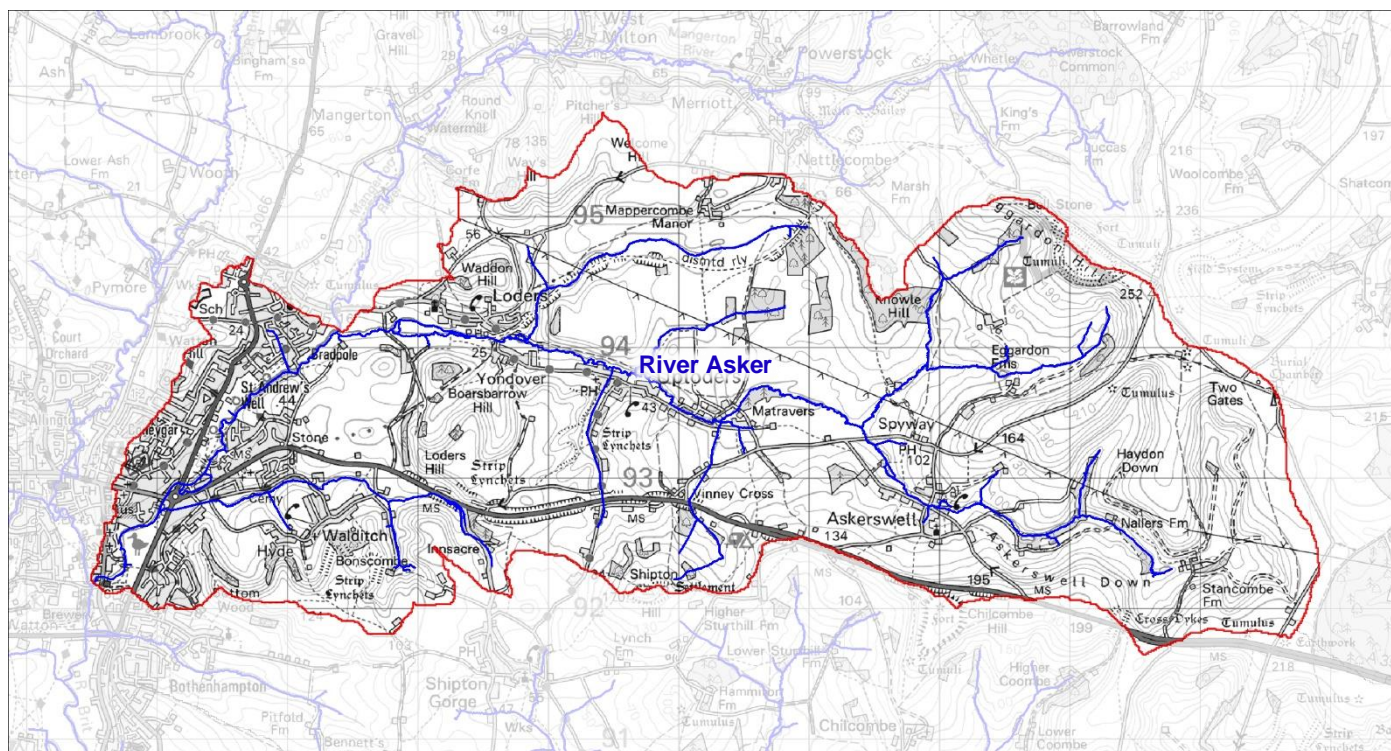


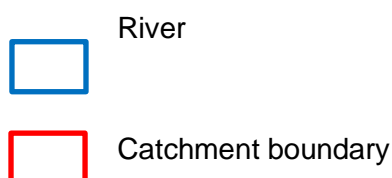


## River Asker



Map of the River Asker catchment

### Key



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## Introduction

The River Asker rises under Eggardon Hill at the meeting between greensand and mudstone and flows over mudstones, clays and sandstones west to Bradpole where it meets the Mangerton Brook, before flowing south into Bridport where it joins the River Brit. Farming is mixed, with dairy units and their associated permanent and temporary grassland along maize as well as some arable.

The entire catchment is in the Dorset Area of Outstanding Natural Beauty.

<b>River length</b>	11.80 km
<b>Catchment area</b>	23.67 km <sup>2</sup>
<b>Geology</b>	Greensand in the upper catchment, leading through calcareous mudstones, limestone to sandstone and clays at the confluence with the Brit
<b>Land use</b>	Small livestock units and permanent grassland. Urban at the confluence with the Brit.



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**Principle towns and villages**

Loders, Uploders, Askerswell, Walditch with suburbs of Bridport; Bradpole and Bothenhampton

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No river in England is in pristine condition, and it is the responsibility of the Environment Agency to monitor how far from pristine the condition of our waterbodies has deviated. It is up to us to tackle the issues affecting the River Asker and make a difference on the ground (because if we don't work together and make a difference, who will?). By conserving and enhancing existing habitats of importance, restoring habitats where possible and working with natural process, it is possible to make meaningful improvements to the condition of the water environment, and ultimately the wellbeing of communities living within the catchment. The River Asker Community Project has been trying to achieve this since 2018, working with members of the community, farmers and conservation organisations to overcome some of the identified threats to the water environment.

The next sections is a summary of the State of the River Asker report compiled as part of the community project, but expanded to include the section of the river that flows south from the confluence with the Mangerton, and includes the Walditch Stream.

This document is a summary and if more detail is needed, the report available on the Dorset AONB website should be referred to<sup>1</sup>.

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<sup>1</sup> <https://www.dorsetaonb.org.uk/downloads/river-asker-report/river-asker-summary-report/>



## Catchment description

### Geology

The geology under our feet heavily influences how water moves through the catchment, the soils that form above it and the plants and animals that live here. It also influences how we use the land to produce food.

Considering the small size of the catchment, there is a wide range of rock types, which impart particular properties on the River Asker. Starting in the east, under Eggardon Hill, the bedrock is chalk. This rock is made up of tiny calcareous skeletons of organisms called coccolithophores which makes the rock porous, with the ability to hold significant amounts of water, like a sponge. It was laid down in warm, shallow seas about 90-100 million years ago, during the Cretaceous period. The chalk is the youngest rock within the catchment, meaning that it has been eroded to expose the older rocks below. Chalk covers approximately 25% of the catchment area and gives rise to the important calcareous grassland habitat present as well as providing a stable flow of calcium-rich water into the river. This stable flow of temperature-constant water from chalk provides the perfect conditions for plants, insects and fish to thrive. 'Chalk streams' are almost unique to southern England and are therefore considered globally rare habitats. Because the Asker quickly flows over a succession of other rock types, it is not considered a 'classic' chalk stream - such as the River Avon in Wiltshire - but none-the-less it is of importance for wildlife because of these characteristics.

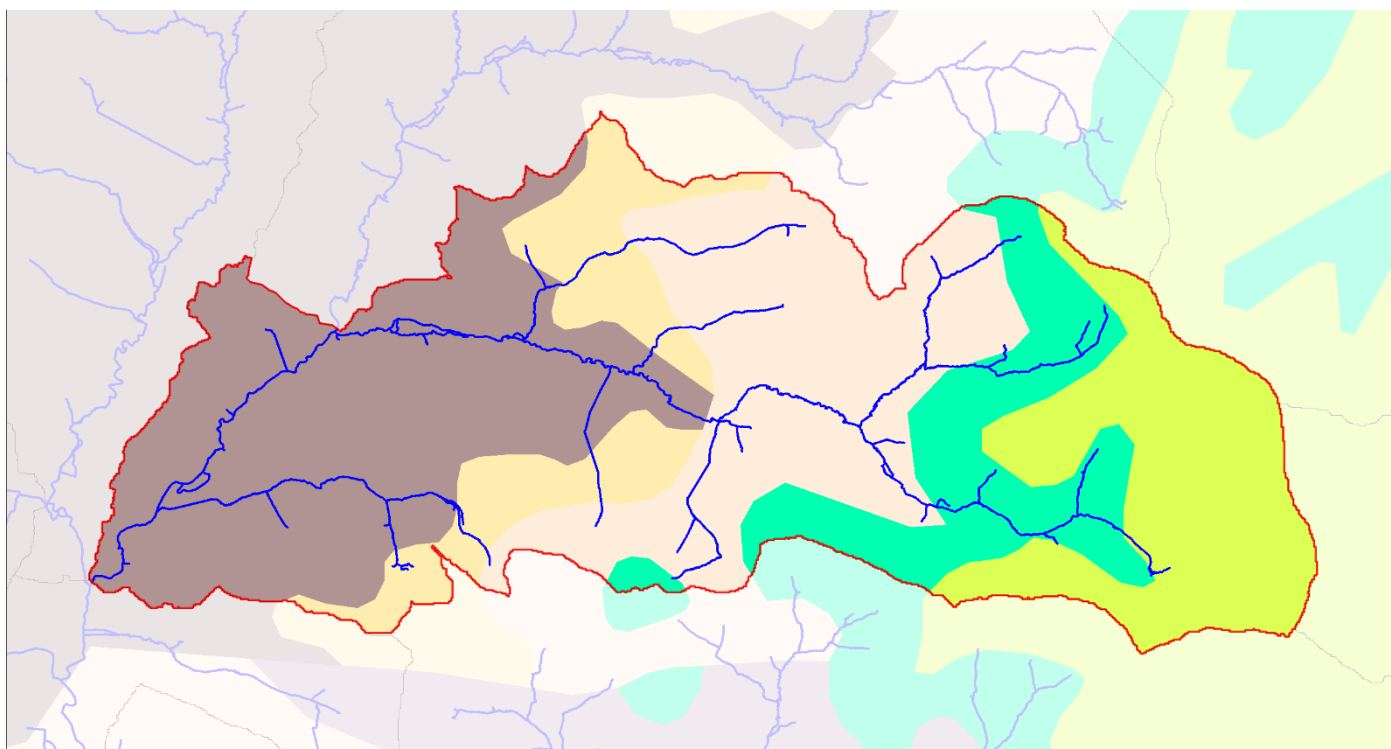
Moving westward the next rock in the sequence is sandstone, laid down between 110-110 million years ago. This rock is less porous than the chalk above it, and therefore the water that was stored in the chalk is forced out and forms the headwaters of the River Asker. This type of sandstone is thought to naturally release nutrients into rivers and can make things more complicated when identifying sources of pollutants. The sandstone covers approximately 17% of the catchment area.

Flowing westwards, the river next passes over a mudstone laid down between 165-170 million years ago and makes up 29% of the catchment area. The river next flows over a mix of mudstones and limestones from the Inferior Oolite Group and Lias Group. These were laid down between 200-210 million years ago and make up approximately 30% of the catchment area. Vinney Cross Local Geological Site is a fossiliferous exposure of the Inferior Oolite.

As the river moves over the 59% of the catchment made up of mudstones, the character will change from that of a chalk stream. These impermeable rocks will no longer absorb rain fall and release it slowly, like the chalk and sandstone, but will force rainwater to flow over land, therefore making the river much quicker to react to rainfall events, increasing the likelihood of flooding. Overland runoff will also erode more soils, leading to increased sedimentation within the river.

In summary, the differing geologies of the Asker catchment impart different properties on the river. In the east, with the chalk and sandstone, the river will display rare chalk stream characteristics. Moving westwards over the mudstones, it becomes more typical of other English lowland rivers, reacting quickly to rainfall events and becoming muddy (or turbid).

The map below shows the extent of the geology within the catchment.



Map of the River Asker underlying geology

Key

-  River
-  Catchment boundary
-  Lias Group: mudstone, siltstone, limestone and sandstone
-  Inferior Oolite group: limestone, sandstone, siltstone and mudstone
-  Great Oolite Group: sandstone, limestone and argillaceous rocks
-  Gault Formation and Upper Greensand Formation: mudstone, sandstone and limestone,
-  White Chalk Subgroup

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## Soil types

Heavily influenced by the underlying geology, soils are at the interface between biotic (living) and abiotic (non-living) worlds. These are important stores of carbon and biodiversity in their own right and provide the foundations from which others can grow. The characteristics of soil dictate what can grow from them, including habitats, crops for food and forage for animals. Soils can be broadly described as basic (acid), calcareous (alkaline) and neutral. The soils of the Asker catchment are mostly neutral with some acid and with a patches of calcareous in the east.

Moving east to west along the course of the River Asker, the following soil types are encountered. They are closely linked to the underlying geology. The information provided below has been sourced from Soilscales, provided by the Cranfield Soil and Agrifood Institute.

Slightly acid loamy and clayey soils with impeded drainage (Soilscale 8). This soil type supports a wide range of pasture and woodland types. It is reasonably flexible in terms of farming types but is more suited to autumn sown crops and grassland, but soil condition may limit safe groundwork and grazing, particularly in spring. The soil is particularly vulnerable to pollution run-of and rapid through-flow to the stream network. Surface capping can trigger erosion of fine sediment..

Shallow lime-rich freely draining soils over chalk or limestone (Soilscale 3). This soil type support herb-rich downland and limestone pastures, beech hangers and other lime-rich woodlands. It is suited to spring and autumn cereals but the soils are especially vulnerable to nitrate leaching and attract stricter fertiliser limits. Lack of soil moisture due to the free draining nature of the soil is most likely a limiting factor to yields. The soil is particularly vulnerable to leaching of nitrate and pesticides to groundwater; surface capping and erosion of chalk soils on steeper slopes under cereals is linked with eutrophication and silting of chalk streams and their gravel trout spawning beds. This soil type falls mostly within Agricultural Land Classification (ALC) 3.

Freely draining slightly acid loamy soils (Soilscale 6). This soil type supports neutral and acid pastures and deciduous woodlands. It is suited to a range of spring and autumn sown crops; under grass the soils have a long grazing season. Free drainage reduces the risk of soil damage from grazing animals or farm machinery. Shortage of soil moisture is most likely a limiting factor on yields, particularly where stony or shallow. Groundwater contamination with nitrates, siltation and nutrient enrichment of streams from soil erosion on certain of these soils. This soil type falls mostly within ALC 3.

Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (Soilscale 18). This soil type supports seasonally wet pastures and woodlands. It is suited to grass production for dairying or beef; some cereal production often for feed. Timeliness of stocking and fieldwork is important, and wet ground conditions should be avoided at the beginning and end of the growing season to avoid damage to soil structure. Land is tile drained and periodic moling or subsoiling will assist drainage. The main risks are associated with overland flow from compacted or poached fields. Organic slurry, dirty water, fertiliser, pathogens and fine sediment can all move in suspension or solution with overland flow or drain water. This soil type falls mostly within ALC 4 and 5.

Lime-rich loamy and clayey soils with impeded drainage (Soilscale 9). This soil type supports base-rich pastures; some wetter areas and lime-rich flush vegetation. It is suited to autumn sown crops and grass but shortage of soil moisture can restrict yield, and timeliness with field work is important to avoid structural damage, particularly in spring. Land is drained and nitrate vulnerable with potential for rapid pollutant transport. Surface capping can trigger sheet erosion of fine sediment to stream networks. This soil type falls mostly within ALC 3.

Loamy and clayey floodplain soils with naturally high groundwater (Soilscale 20). These are naturally wet and have moderate fertility and medium carbon storage potential. They are suitable for wet flood meadows with wet carr woodlands in old river meanders and can be used for grassland with some arable. The main

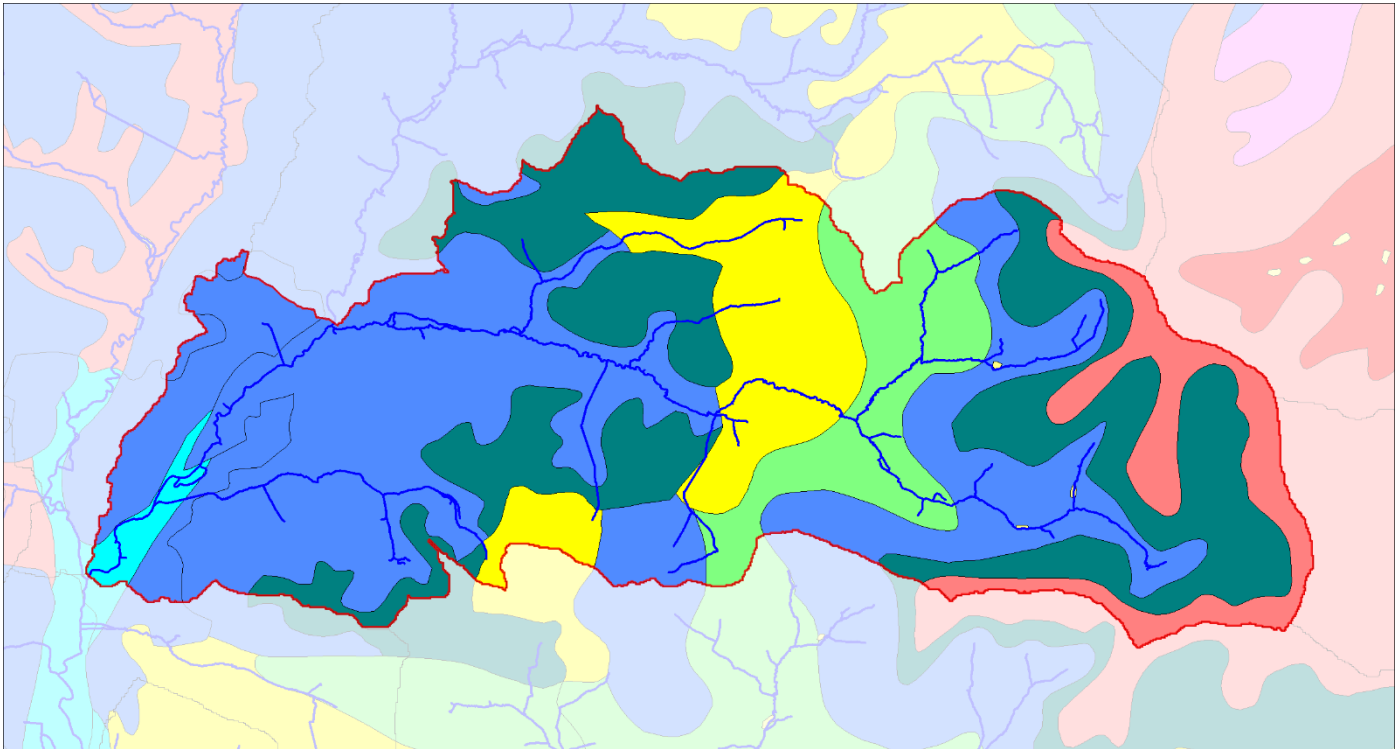




risks to the water environment are due to their close proximity to river, resulting in pollution risk from floodwater scouring and from drainage water after spreading of fertiliser or slurry.

In summary, the variable nature in soils mirror the underlying geology and have the potential for different impacts on the River Asker as it flows westwards through its catchment.

The map below shows the extent of the Soilscape in the catchment.



Map of the River Asker catchment soils

Key

-  River
-  Catchment boundary
-  Soilscape 3: Shallow lime-rich soils over chalk or limestone
-  Soilscape 18: slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils
-  Soilscape 6: freely draining slightly acid loamy soils
-  Soilscape 8: slightly acid loamy and clayey soils with impeded drainage
-  Soilscape 9: Lime-rich loamy and clayey soils with impeded drainage

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Soils Data © Cranfield University (NSRI) and for the Controller of HMSO 2021



Soilscape 20: Loamy and clayey floodplain soils with naturally high groundwater



## Land use

The geology and soils of the Asker catchment have strongly influenced how this land has been used. Where it is fertile and accessible to farm machinery, it may be used for arable crops or intensive grass for dairy or beef. Where the soil is less fertile or the land too steep or waterlogged, then it may be more extensively used, leaving fragments of semi-natural habitats. This fragmentation of semi-natural habitat has increased greatly since the Second World War because of improved capability of farm machinery and techniques that make farming marginal land economically viable, alongside government incentives. This was driven by an increasing population and subsequent higher demand for food. As a result, over 97% of all semi-natural habitats mapped in Dorset in the 1930s have been converted to agriculturally improved arable or grassland. This will have knock-on impacts on the water quality of the River Asker, with increased contamination of sediments and nutrients from agriculture along with increased isolation of the semi-natural habitat that exists along the river corridor.

Looking in a bit more detail at the land use of the Asker catchment, we can split it down into a number of categories that are described below. The figures are derived from a study undertaken in 2018 that mapped land use in the Dorset AONB from existing data, aerial photography and satellite images.

### Intensive land use

Improved grassland covers 47% of the catchment area. Improved grassland will predominantly be used to support dairy cows. The grassland will be planted 'leys' dominated with grass species, such as ryegrass, possibly with clovers, that are periodically ploughed up and replanted. To maintain their condition, they will be treated with nitrates and phosphates several times during the growing season.

Arable covers 27% of the catchment area. This will include several crop types grown within the catchment, grown in rotation along with maize which is grown as a fodder crop to support dairy production. Winter cereals and maize are high risk crops with regards to soil erosion, particularly on steep slopes, because bare soil is exposed at times of potential high rainfall. Good agricultural practises can mitigate these risks, by, for example, growing of cover crops that bind soils together.

In total, intensive land use covers three quarters of the catchment area and therefore has the potential to have significant effects on the water environment of the River Asker.

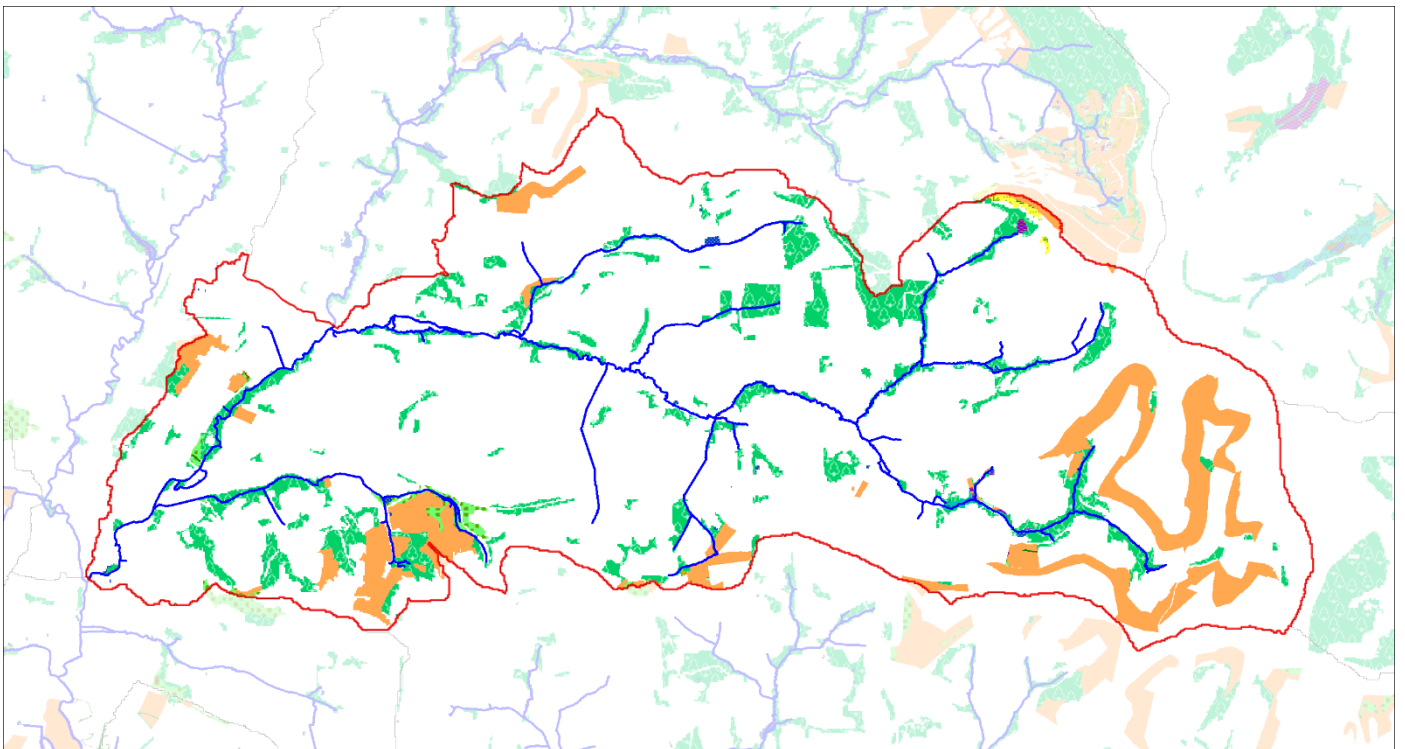
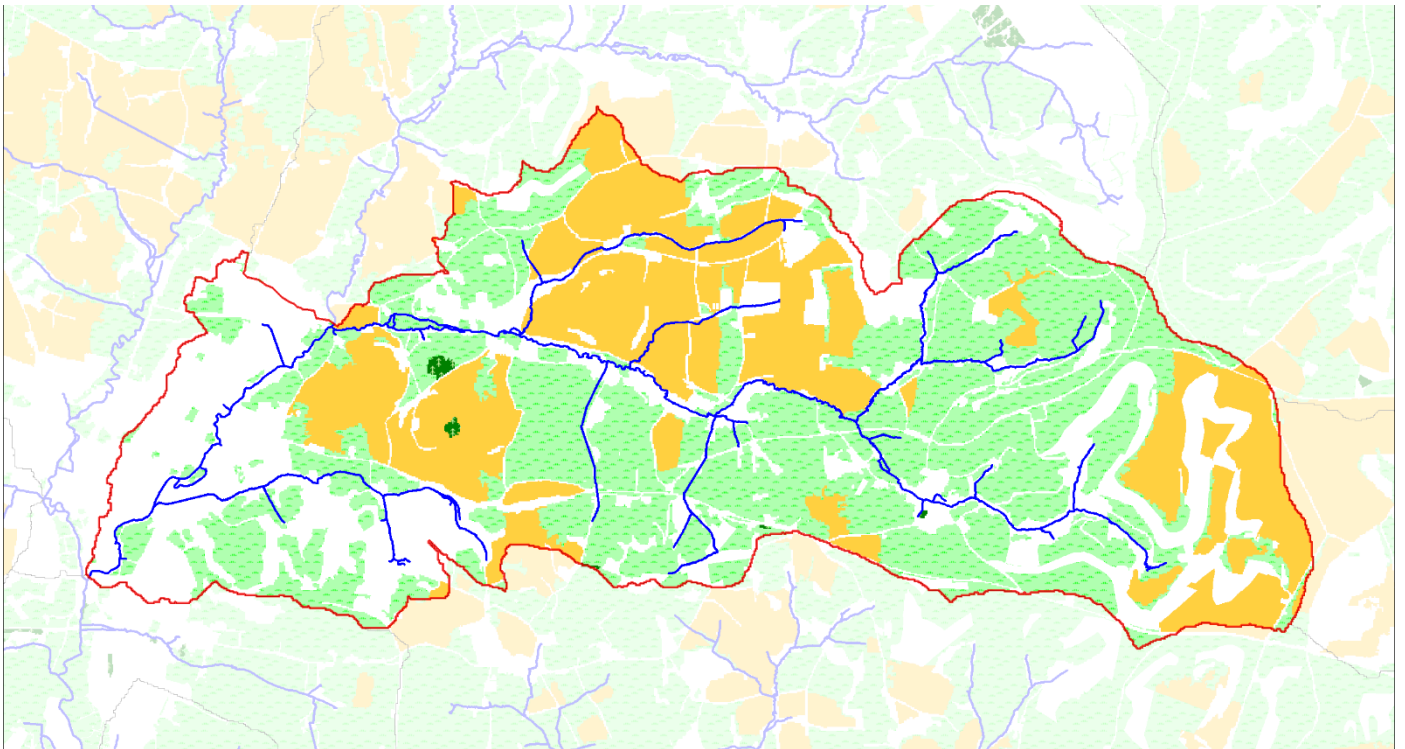
### Extensive land use

Covering 18% of the catchment area are habitats associated with more extensive land use. The most significant of these is broadleaved woodland, including wet woodland, which covers 10%. The other significant category is semi-improved grassland, which covers 8% of the catchment. Semi-improved grassland is not as rich in wildlife as semi-natural grasslands because it has been improved in the past to favour a grass-dominated sward. However, having not been ploughed up recently and as intensively managed, it holds great potential for restoration back to semi-natural habitat.

### Other land use

Urban land cover takes up 5% of the area, and there is an additional 2% that has been classified as gardens (though this category is hard to define because the individual areas are quite small). 1% is water.







## Map of the River Asker catchment intensive land use (top) and extensive land use (bottom)

### Key































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River



Catchment boundary

	Arable		Quarry
	Bare ground		Saltmarsh
	Bracken		Sand dune
	Broadleaved woodland		Scrub
	Cliffs and rocky shore		Semi-improved grassland
	Coniferous plantation		Shingle above high tide mark
	Felled woodland		Tall herb and fern
	Gardens		Unimproved grassland (Acid)
	Hedgerow		Unimproved grassland (Calcareous)
	Improved grassland		Unimproved grassland (Neutral)
	Intertidal habitat		Urban
	Lowland dry heath		Water
	Marshy grassland		Wet heath
	Mixed woodland		Wet woodland
	Parkland/scattered trees		Wetland

Land use categories



## Ecological networks

We have undertaken further analysis of the land use data to identify areas of habitat that are important for the survival of native species, as they provide shelter and food for them. We also looked at how easily these species can move through the landscape between these 'core' habitat sites. We have broken this analysis down into four broad habitat types: grassland, woodland, heathland and wetland. For each of these, we have identified: 'core' habitat, which are extensive land use blocks over 1ha in size; 'stepping stones', which are extensive land use blocks less than 1ha in size; and the 'ecological network', which maps how a species can move between the 'core' habitat blocks using the 'stepping stones' and wider intensive land use. It is vital for the survival of species that they have access to adequate 'core' habitats to shelter, feed and reproduce as well as adapt to extreme weather and climate change.

The most significant networks within the Asker catchment are grassland and woodland. There are no heathland sites and only 14 wetland stepping stone sites.

It is the governments ambition to have 30% of the land managed for wildlife. If we total the 'core' habitat blocks within the catchment, this gives us that total of 20%, so there is an opportunity to improve the situation locally. Natural England also recognise that for a site to function naturally, it should be at least 40ha in size. There are no woodland blocks above this threshold and one grassland unit above this threshold.

### Grassland

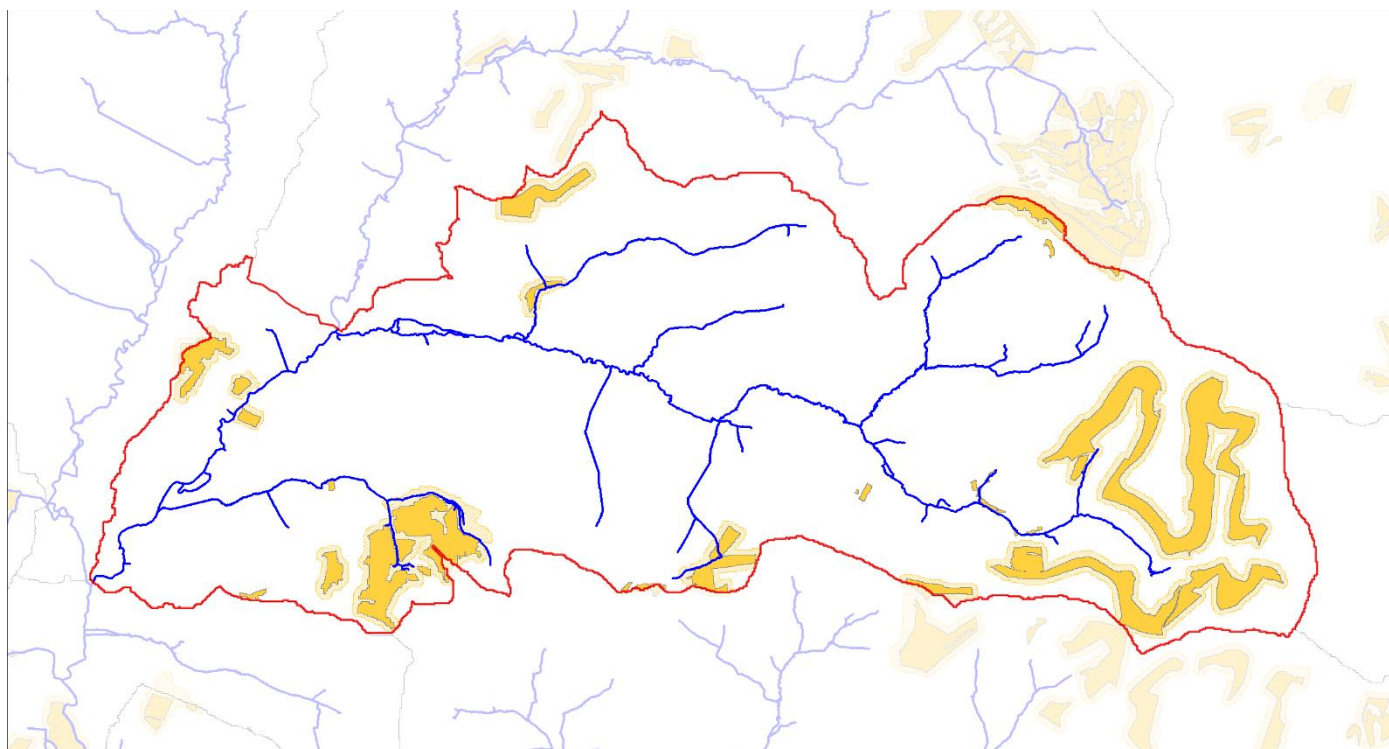
192ha of 'core' and 'stepping stone' habitat exist within the catchment over 42 locations, one of which is over 40ha. The larger sites are mostly in the headwaters of the Asker and Walditch Stream. These sites support a grassland ecological network (for an average medium dispersal species) of 334ha over 10 locations.

### Woodland

277ha of 'core' and 'stepping stone' habitat exist within the catchment over 106 locations, none of which are above 40ha. These sites support a woodland ecological network (for an average medium dispersal species) of 645ha over 27 locations.





### Heathland and wetland

There are no heathland sites because the required geological and soil conditions do not exist within the catchment. There are very few wetland sites within the catchment, which means species reliant on this habitat are poorly serviced in the Asker catchment.

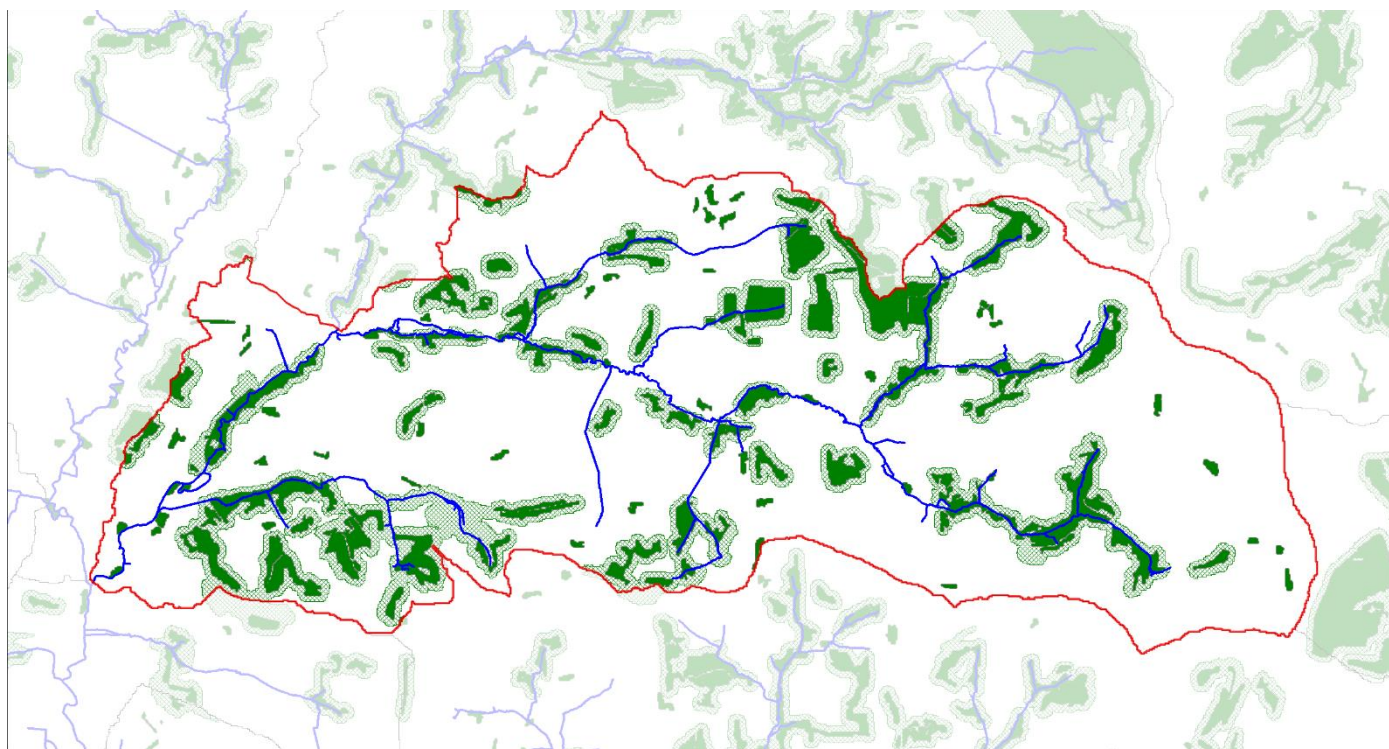


Map of the River Asker catchment grassland ecological network

Key





-  River
-  Catchment boundary
-  Grassland core (>1ha) and stepping stone (<1ha) sites
-  Grassland ecological network for a medium dispersal species

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Map of the River Asker catchment woodland ecological network

Key

-  River
-  Catchment boundary
-  Woodland core (>1ha) and stepping stone (<1ha) sites
-  Woodland ecological network for a medium dispersal species

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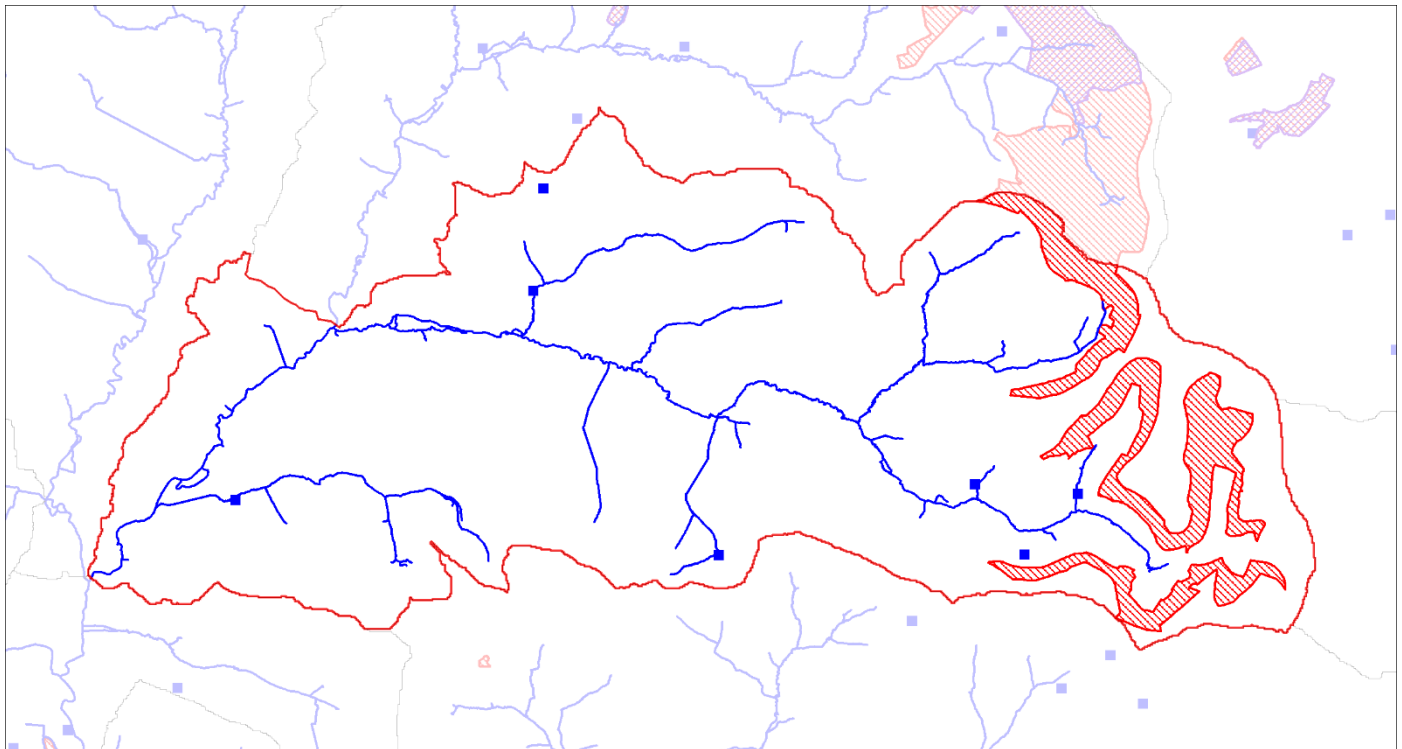




## Designations






There are two Sites of Special Scientific Interest (SSSI) within the catchment, covering approximately 150ha. These are Eggardon Hill & Lucas Farm SSSI and Haydon & Askerswell Downs SSSI.

There are 7 Sites of Nature Conservation Interest covering approximately 34ha.



Map of the River Asker catchment environmental designations

### Key

-  River
-  Catchment boundary
-  Sites of Special Scientific Interest (national)
-  Special Area of Conservation (international)
-  Sites of Nature Conservation Interest – point (local)

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## Catchment pressures

### Water Framework Directive assessment:

The Environment Agency classify waterbodies such as the Char and Monkton Wyld Stream into categories that reflect their overall condition. These are **High** > **Good** > **Moderate** > **Poor** > **Bad**. The Asker is categorised as **Poor**. The aim is to have waterbodies classed as Good, so the Asker is currently considered to be a failing watercourse. It was classified as Poor in 2015 and 2016, and moderate in 2013 and 2014.

The areas that the Environment Agency monitor to come up with their classification are summarised below. There is more detail behind these categories, which is available from the Catchment Data Explorer website<sup>2</sup>.

Classification area		Condition assessment category
<b>Overall</b>		<b>Poor</b>
<b>Ecological</b>	Biological	<b>Poor</b>
	Hydromorphological	Supports Good
	Physico-chemical	<b>Good</b>
	Specific pollutants	No data
<b>Chemical</b>	Priority substances	<b>Good</b>
	Other pollutants	Does not require assessment
	Priority hazardous substances	<b>Bad</b>

The specific elements that are currently failing are:

- Macrophytes and Phytobenthos, essentially the plant population alongside and within the river itself.
- Fish
- Polybrominated diphenyl ethers (PBDE)
- Mercury and its compounds

The impacts on the biology of the river are a reduced fish population with limited species diversity and abundance, compared to what you would expect in a natural stream of similar characteristics. There is also reduced in-stream plant diversity and abundance. Little is currently known about the impacts of the hazardous substances on wildlife, and this an area of further work for the Environment Agency.

### Local assessment:

To get a local perspective on the condition and threats face by the River Asker, we carried out community consultation in 2018. The main causes of concern were felt to be:

- Artificial barriers: this impacts fish populations and causes sedimentation of the river bed

<sup>2</sup> <https://environment.data.gov.uk/catchment-planning/WaterBody/GB108044009580>



- Shade from riparian trees: this impacts aquatic plants and riparian plants.
- Catchment land use: this has the potential to impact the duration and severity of flood waters and is a source of phosphate-contaminated sediment.
- Agricultural phosphate from diffuse sources: this impacts aquatic plants.
- Invasive species: this impacts riparian plants and causes bank erosion, which is a source of sediment.

We have also consulted other stakeholders about their views on the threats facing the River Asker, including Dorset Council, Wessex Water and the Environment Agency, amongst others. We did this in 2015 and updated it in 2021. The findings again reinforce the concerns of the community, with sediment from agriculture, agricultural phosphates, artificial barriers and invasive species all identified as issues. Other issues raised by stakeholder consultation are issues caused by low flows, poor channel morphology leading to poor fish habitat, poor management of flood defence structures around Bridport that impacts wildlife.

The combined areas of most concern, as identified by the Environment Agency and other agencies and local people are:

- Artificial barriers
- Shade from riparian trees
- Catchment land use
- Agricultural phosphate from diffuse sources
- Invasive species
- Poor channel morphology, particularly around Bridport.

These are set in more detail in the State of the River Asker report<sup>3</sup>.

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<sup>3</sup> <https://www.dorsetaonb.org.uk/downloads/river-asker-report/river-asker-summary-report/>