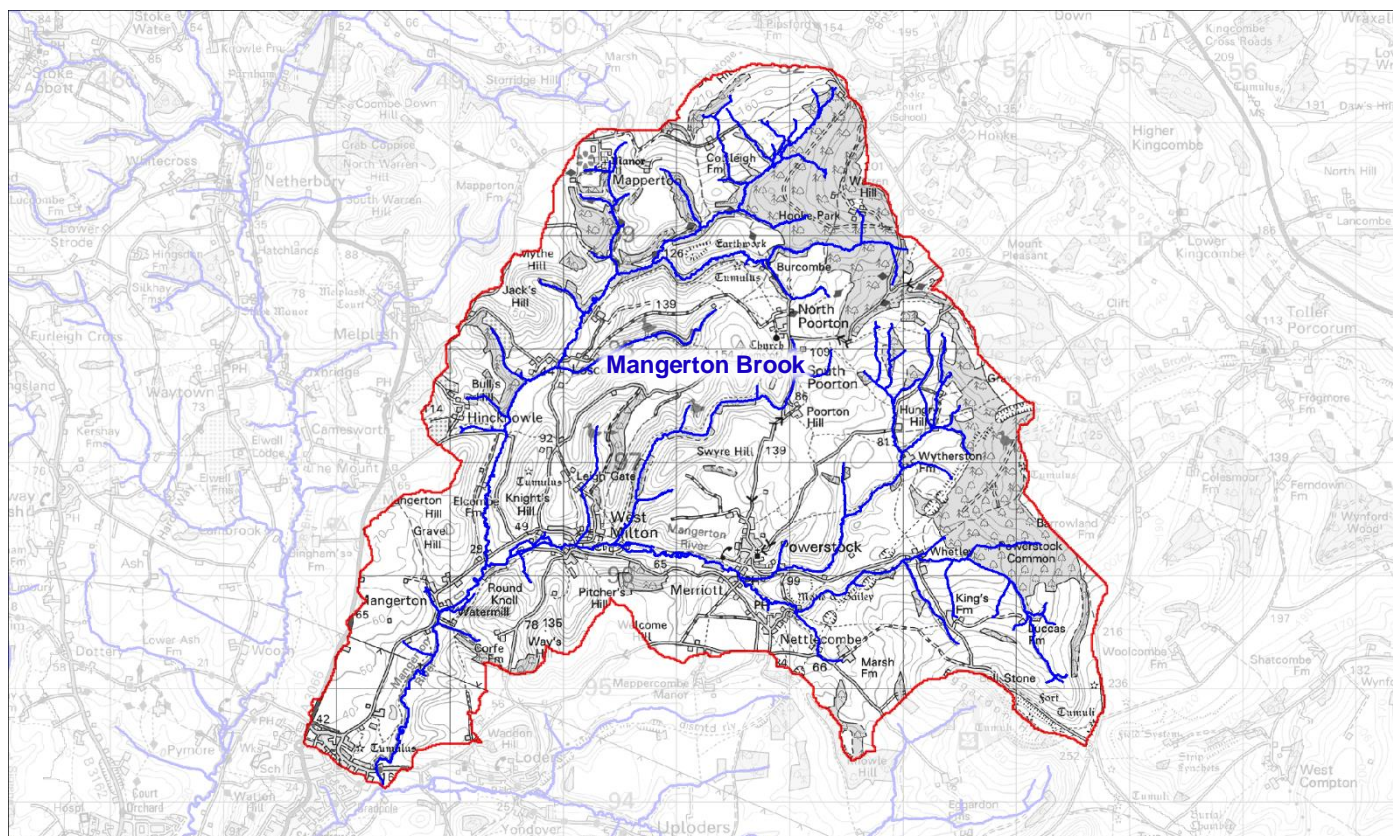




## Mangerton Brook



Map of the Mangerton Brook catchment

Key

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River



Catchment boundary

## Introduction

The Mangerton Brook rises under Eggardon Hill at the meeting between greensand and mudstone and flows over mudstones, clays and sandstones south west to Bridport where it meets the River Asker.

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

<b>River length</b>	13.38 km
<b>Catchment area</b>	25.48 km <sup>2</sup>
<b>Geology</b>	Mud and calcareous mudstones in the headwaters, moving through limestone and sandstone to the confluence with the Asker.
<b>Land use</b>	Small livestock units and permanent grassland.
<b>Principle towns and villages</b>	Mangerton, West Milton, Powerstock, Nettlecombe, Mapperton



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 Mangerton Brook 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 next sections explores the state of the river and wider catchment, the areas that have been identified as at risk from the Environment Agency and from local people, and potential areas to explore that will help deliver our aim of improving the condition of the Mangerton Brook.

This document should be seen as a starting point for discussion and is not meant to be comprehensive. We can work with communities to explore opportunities to help improve the river and wider catchment.



## Environment

### Geology

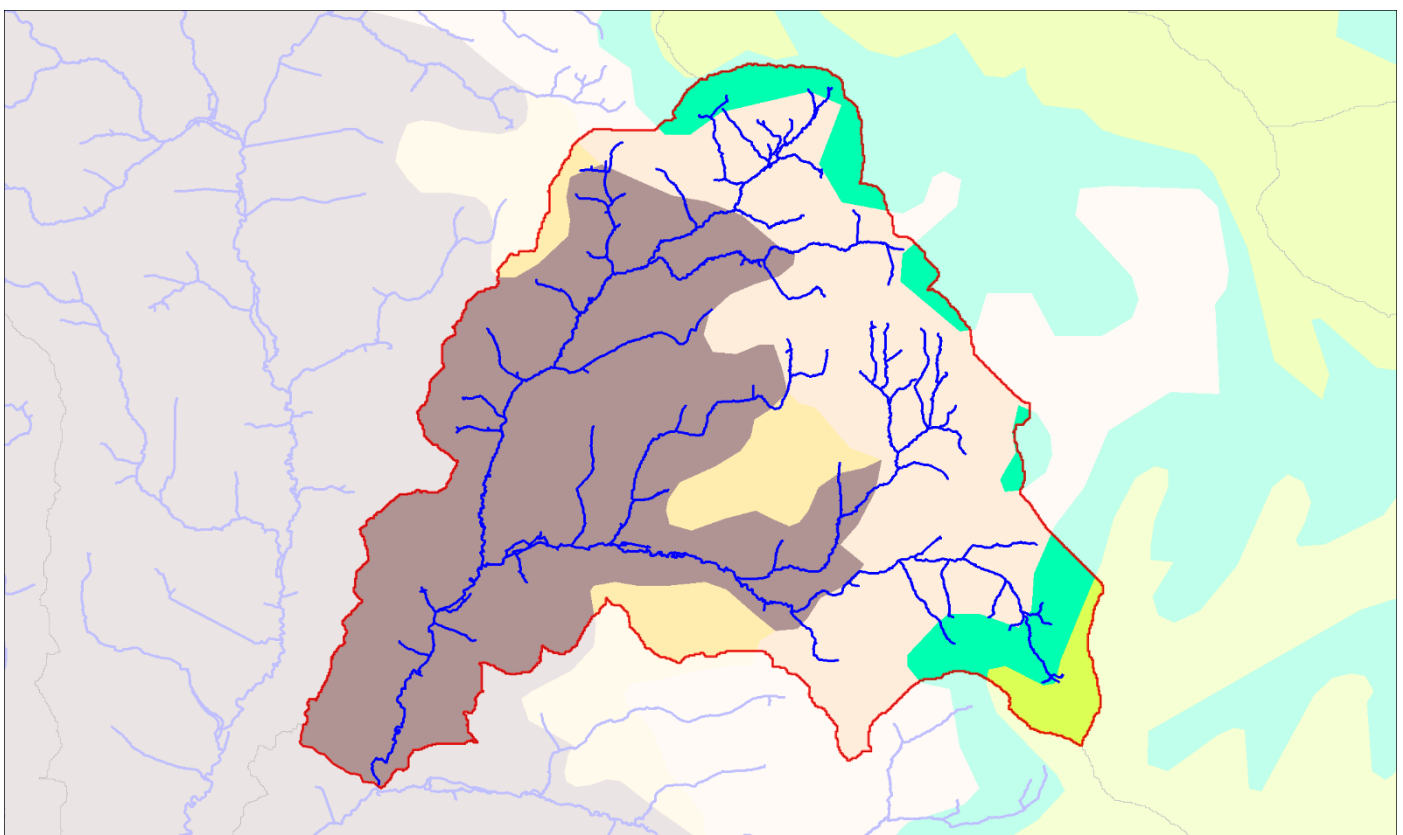
The geology under our feet heavily influences how water moves through the catchment, the soils that form above it and the plants and animals that live here. It also influences how we use the land to produce food.

The catchment is dominated by the Lias Group of rocks. This group is made up mudstones, siltstones, limestone and sandstone that were deposited in shallow seas some 172 to 204 million years ago in the Jurassic and Triassic Periods. In the headwaters north of Beaminster are pockets of Inferior and Great Oolite (sandstones, siltstones, mudstones and limestones), along with the Gault Formation and Upper Greensand Formation (more mudstones, sandstones and limestones) and the White Chalk Group.

The Oolites were formed 165 to 176 million years ago in the Jurassic Period, in shallow seas rich in corals. The Gault Formation and Upper Greensand were formed 94 to 112 million years ago in the Cretaceous Period in shallow seas and were followed by the White Chalk which was also deposited in the Cretaceous Period some 100 million years ago, but this time in warm shallow seas, and consisting of mostly microscopic remains of plankton.

The Lias rocks significantly impede drainage and are therefore the primary reason for the damp character of the Valley. The Chalk, Gault and Greensand are more permeable, absorbing water. This water reappears at the join between the Gault / Greensand and Oolite at springs. The Gault / Greensand has the potential to naturally elevate the levels of phosphate found in the watercourse.

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



Map of the Mangerton Brook underlying geology

Key

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River



Geology Data © British Geological Survey and United Kingdom Research & Innovation 2021



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



### 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. Soils can be broadly described as basic (acid), calcareous (alkaline) and neutral. The soils of the Mangerton catchment are mostly neutral with some acid and with a small patch of calcareous in the north east.

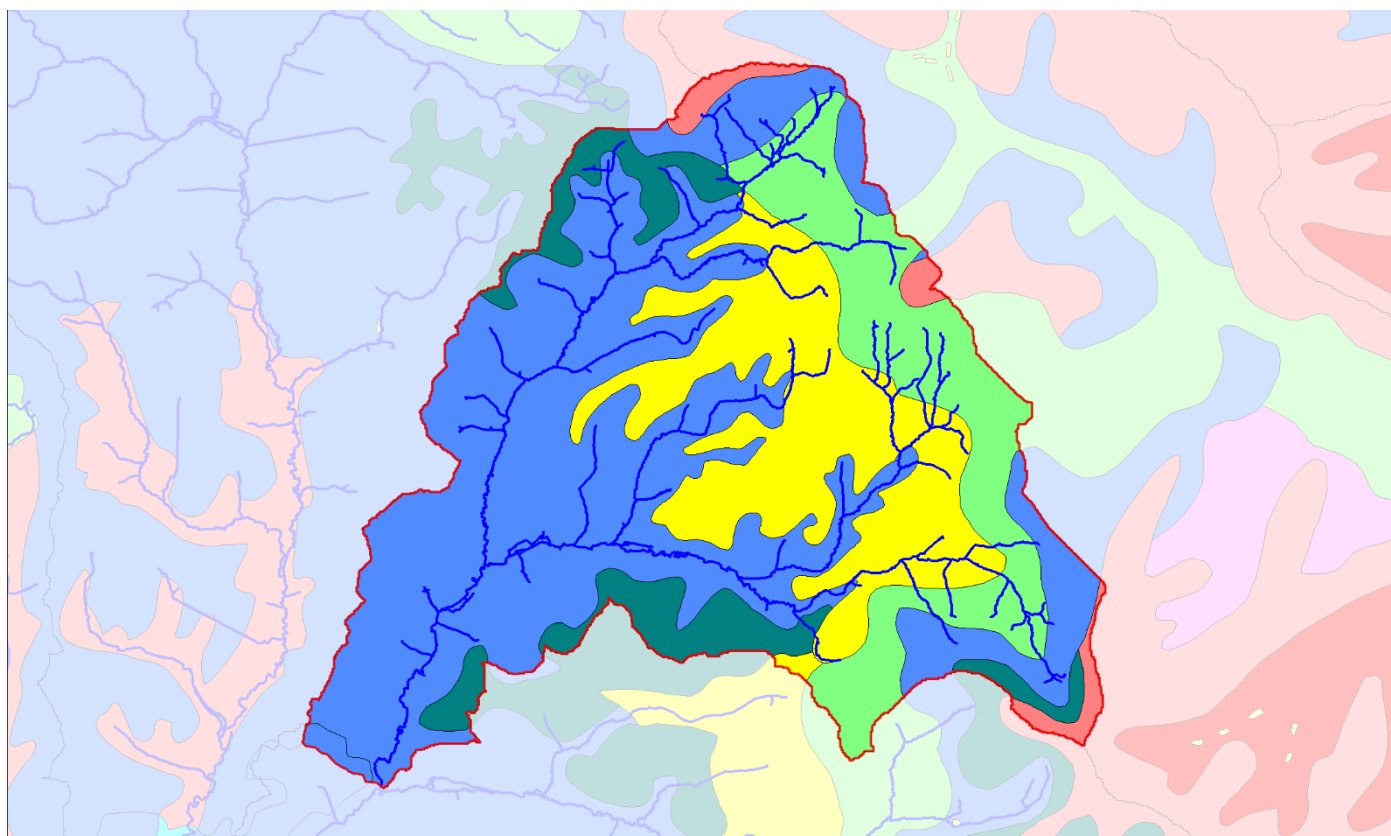
The dominant soil type, as characterised by Cranfield University's Soilscales, is 'Freely draining slightly acid loamy soils'. They are freely draining and have low fertility. They are suitable for neutral and acid pastures and deciduous woodlands and can be used for grassland and arable. There is low potential for carbon storage. Water drains to local groundwaters and streams network and the main risks are groundwater contamination with nitrate and siltation and nutrient enrichment of streams from soil erosion.

Other soils in the headwaters of the catchment are:

- 'Slightly acid loamy and clayey soils with impeded drainage.' These slightly impede drainage, feed into the stream network, have moderate to high fertility but low carbon storage potential. They are suitable for a wide range of pasture and woodland types and can be used for arable and grassland. The main risks to the water environment are drained farmland making streams more vulnerable to pollution run-off and rapid through-flow; surface capping can trigger erosion of fine sediment.
- 'Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils.' They impede drainage and have moderate fertility. They are suitable for seasonally wet pasture and woodland habitat and can be used for grassland and arable, with some woodland. There is low potential for carbon storage. Water drains to a stream network (rather than groundwater) and 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.
- 'Shallow lime-rich soils over chalk or limestone'. These are freely draining to groundwater, lime-rich moderate fertility and have low to medium carbon storage potential. They have the potential to host herb-rich downland pastures along with beech hangers and other lime-rich woodlands. They are used for arable and grassland and they 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 streams and their gravel spawning beds.
- 'Lime-rich loamy and clayey soils with impeded drainage'. They have slightly impeded drainage which discharges to the stream network. They are highly fertile and have low carbon storage potential. They have the potential to host base-rich pastures and classic chalky boulder clay ancient woodlands along with some wetter areas and lime-rich flush vegetation. They are used for arable some grassland and historically have been drained, are nitrate vulnerable leading to the potential for rapid pollutant transport. Surface capping can trigger sheet erosion of fine sediment to stream network.

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





Map of the Mangerton Brook 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



### Land use

The geology and soils of the Mangerton 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 Mangerton Brook, 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 Mangerton 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 49% 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 10% 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.

Coniferous woodland plantations cover 3% of the catchment area, exclusively in the headwaters.

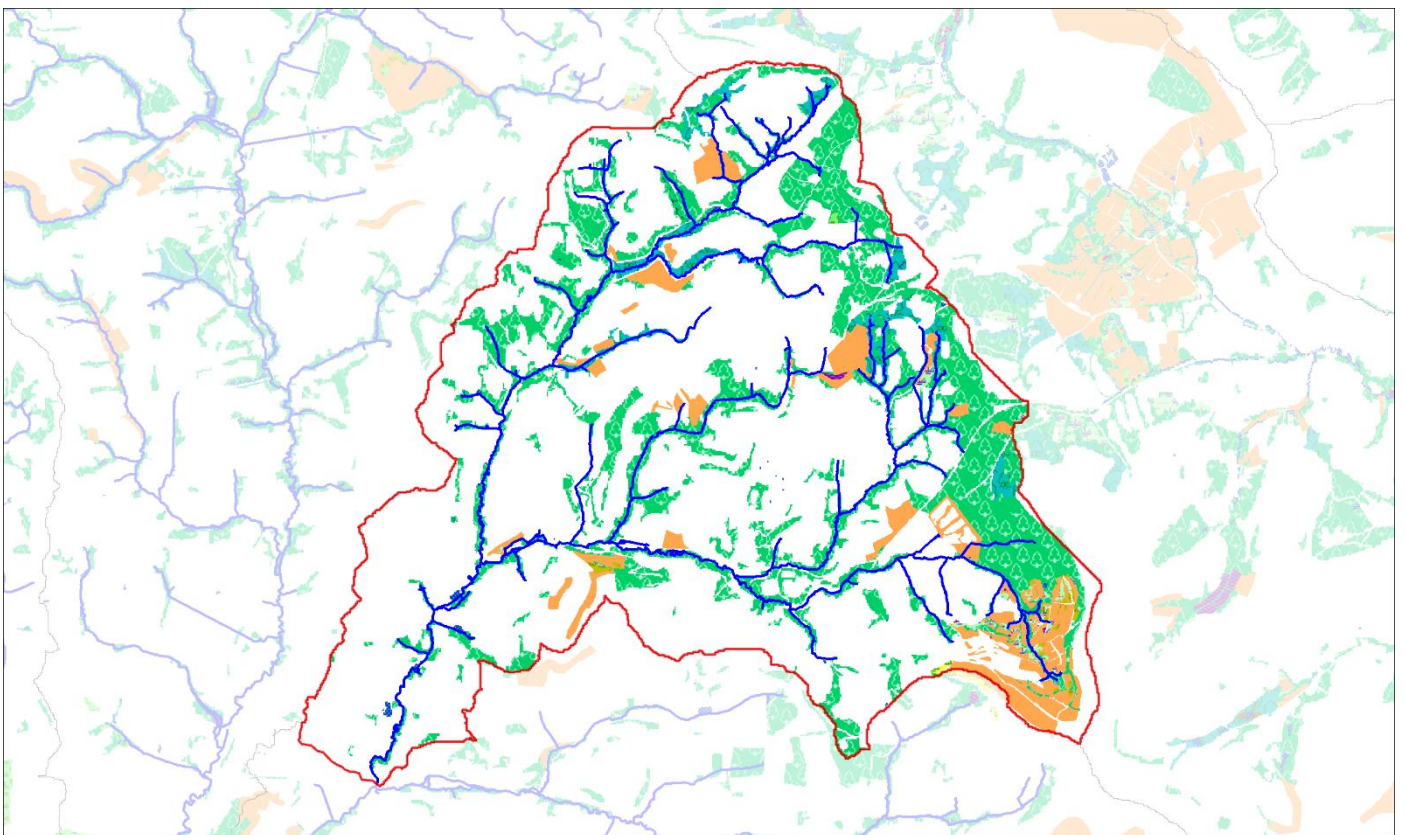
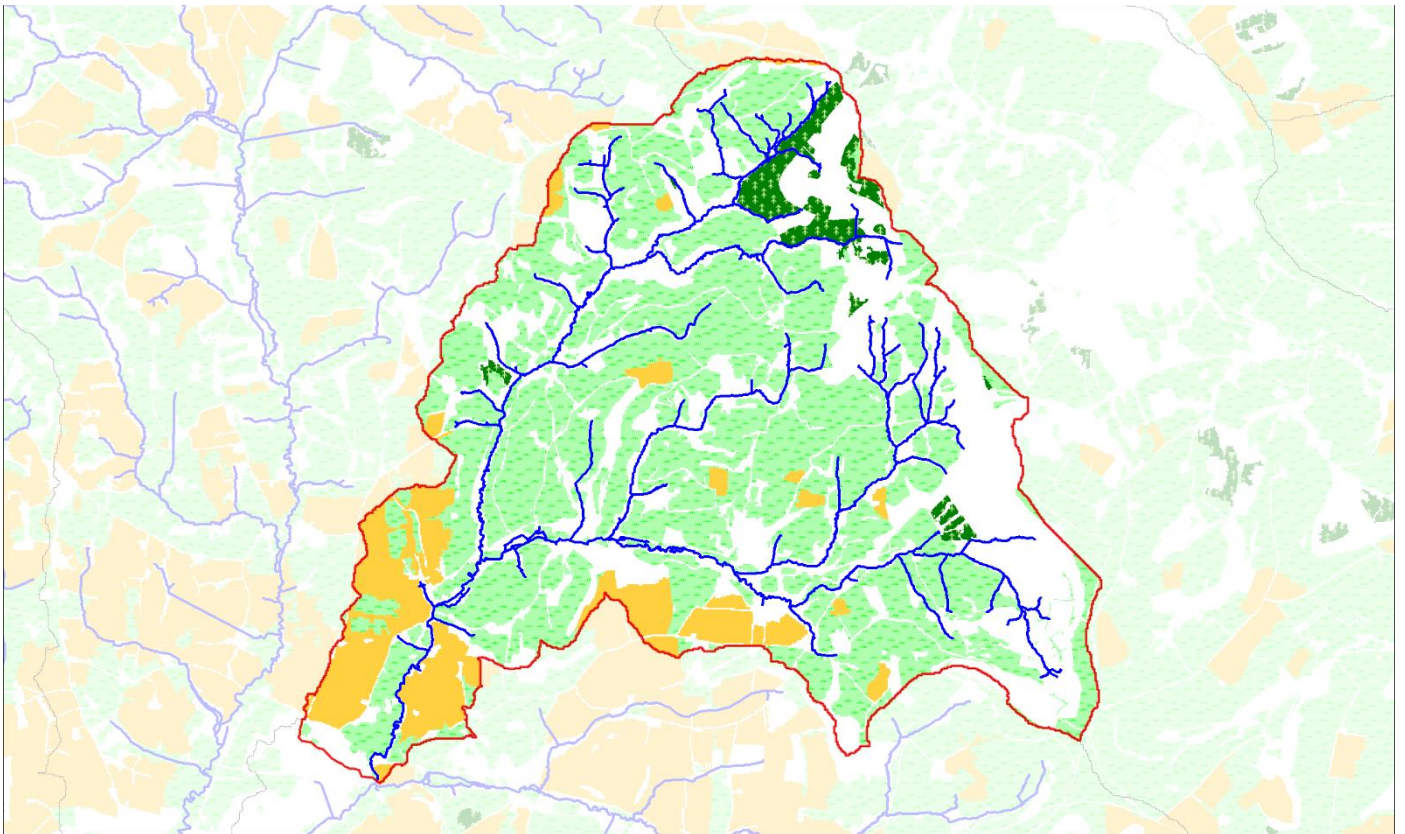
In total, intensive land use covers close to two thirds of the catchment area and therefore has the potential to have significant effects on the water environment of the Mangerton Brook.

#### Extensive land use

Covering 30% of the catchment area are habitats associated with more extensive land use. This is high coverage compared to other areas of the Dorset AONB. The most significant of these is broadleaved woodland, including wet woodland, which covers 25%. The other significant category is semi-improved grassland, which covers 5% 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 1% 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 Mangerton Brook 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 Mangerton catchment are grassland and woodland. There are no heathland sites and only 13 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 30%, which is rare in a Dorset AONB context. Natural England also recognise that for a site to function naturally, it should be at least 40ha in size. There are four woodland blocks above this threshold that straddle the catchment boundary, including one that is a significant 497ha. There are no grassland units above this threshold.

#### Grassland

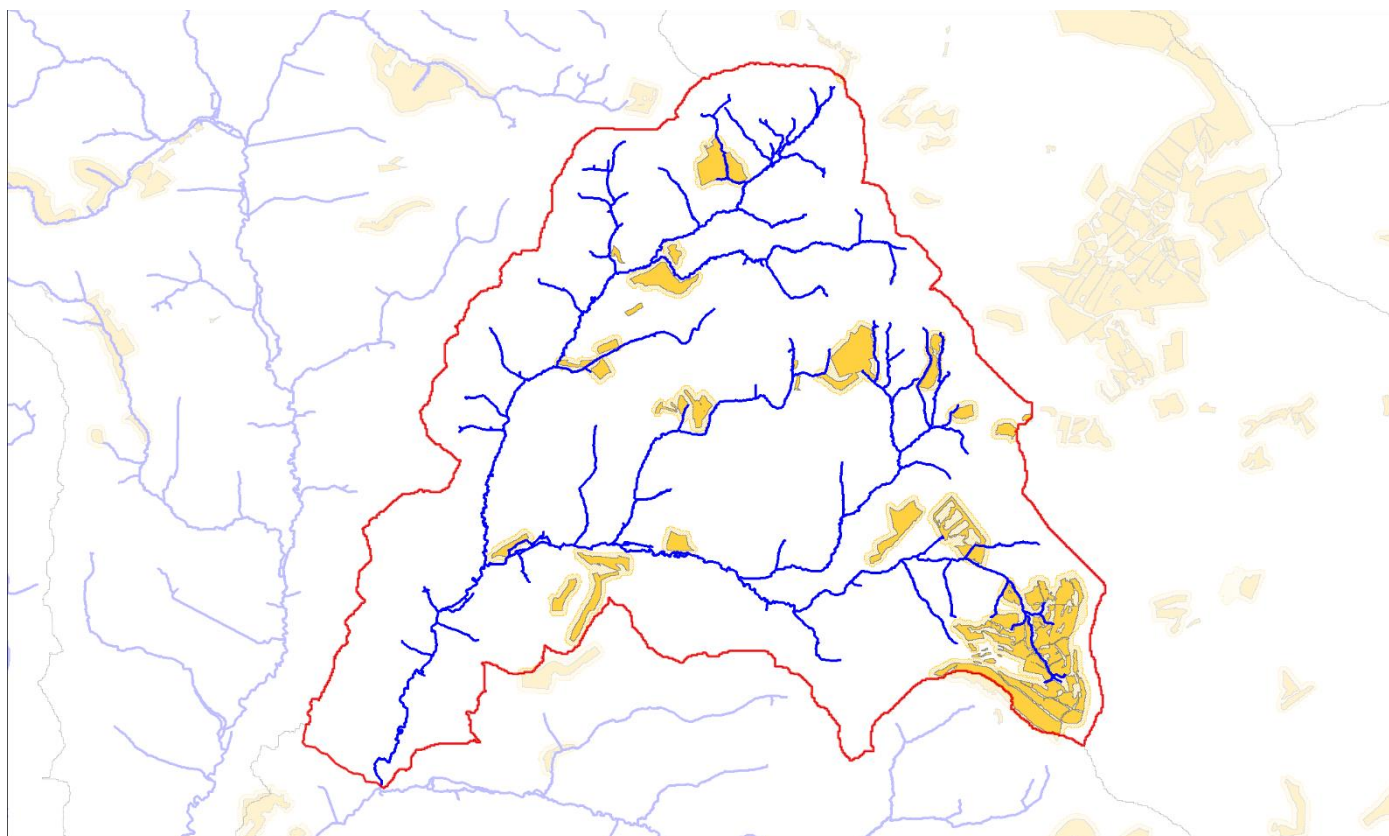
146ha of 'core' and 'stepping stone' habitat exist within the catchment over 54 locations, none of which are over 40ha. The larger sites are mostly in the headwaters of the catchment. These sites support a grassland ecological network (for an average medium dispersal species) of 282ha over 15 locations.

#### Woodland

631ha of 'core' and 'stepping stone' habitat exist within the catchment over 91 locations, four of which are above 40ha. There are significant blocks in the headwaters, as well as stretching alongside the upper reaches of the river. These sites support a woodland ecological network (for an average medium dispersal species) of 1614ha over 14 locations. The larger are and low number of locations means that each block is of considerable size, with the average being 115hs. This means that there is great potential for woodland species to function naturally and withstand climatic and disease extremes.





#### 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 Mangerton catchment.

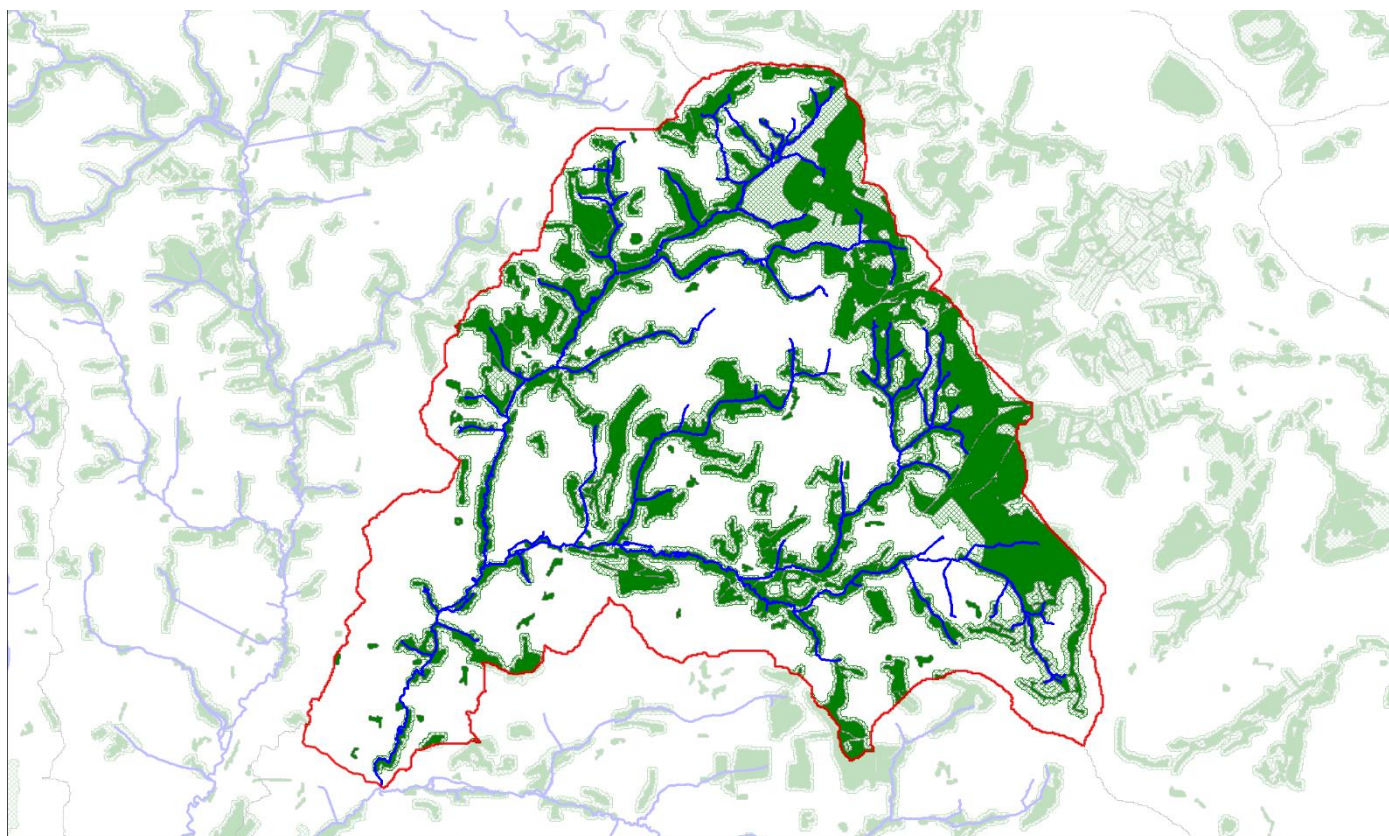


Map of the Mangerton Brook catchment grassland ecological network

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 Mangerton Brook 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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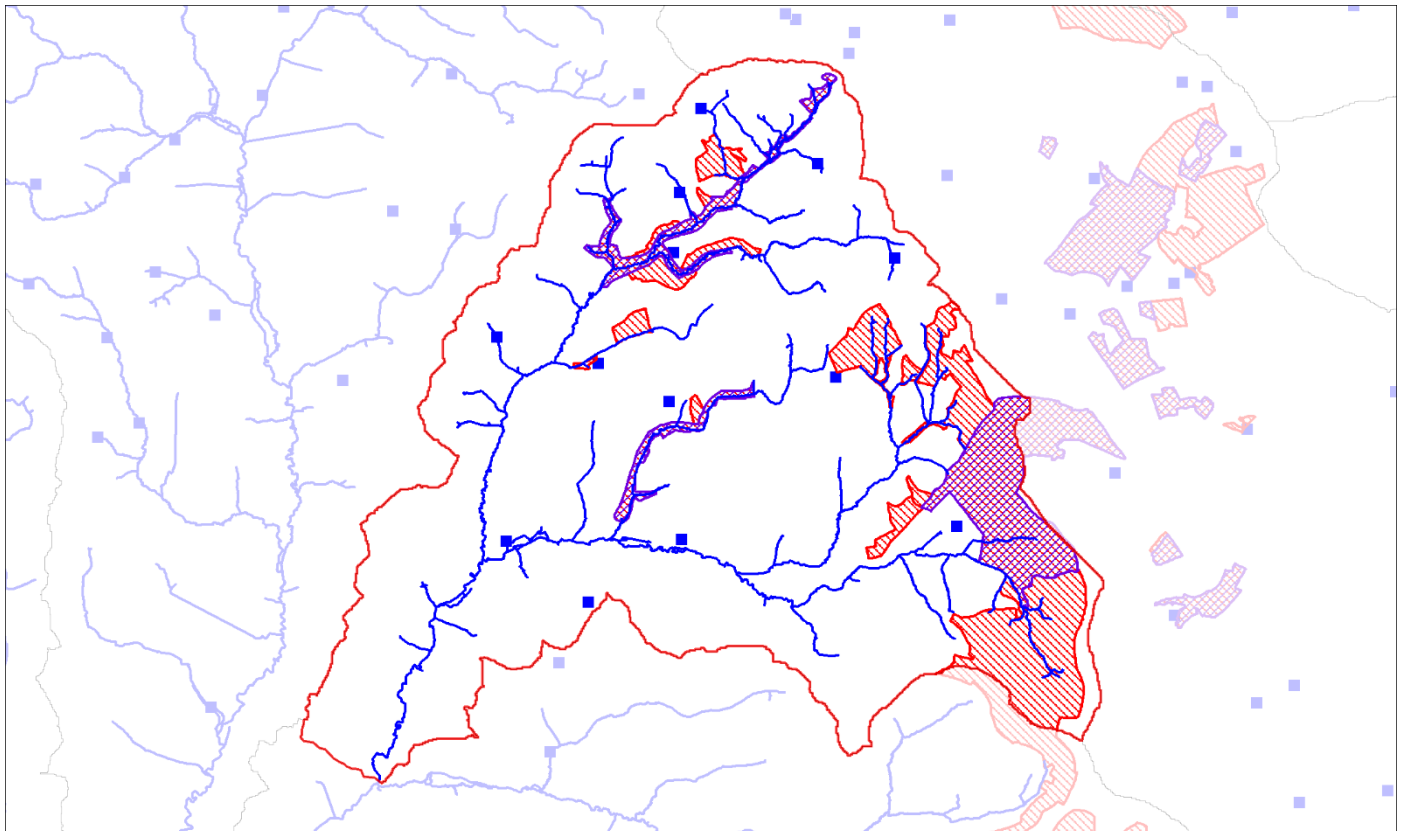




## Designations






The large area of extensive land use and core habitat is reflected in the large number of wildlife designations in the catchment. There are five Sites of Special Scientific Interest (SSSI) within the catchment, covering approximately 400ha. These are, Drakenorth SSSI, Eggardon Hill & Lucas Farm SSSI, Mapperton and Poorton Vales SSSI, Powerstock Common and Wytherston Farm SSSI and Whetley Meadows SSSI. The West Dorset Alderwoods Special Area of Conservation also covers parts of Powerstock Common and Wytherston Farm SSSI and Mapperton and Poorton Vales SSSI.

There are 13 Sites of Nature Conservation Interest covering approximately 175ha.



Map of the Mangerton Brook 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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## Issues & Impacts

### Water Framework Directive assessment:

The Environment Agency classify waterbodies such as Mangerton Brook into categories that reflect their overall condition. These are **High** > **Good** > **Moderate** > **Poor** > **Bad**. The Mangerton is categorised as **Moderate**. The aim is to have waterbodies classed as Good, so the Mangerton is currently considered to be a failing watercourse. It was classified as Good in 2013, 2014, 2015 and 2016. The change in classification may not be the result of condition deteriorating, but the improved ability to identify substances of harm within the watercourse.

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>1</sup>.

Classification area		Condition assessment category
Overall		Moderate
Ecological	Biological	High
	Hydromorphological	Supports Good
	Physico-chemical	Good
	Specific pollutants	No data
Chemical	Priority substances	Good
	Other pollutants	Does not require assessment
	Priority hazardous substances	Bad

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, we carried out consulted other stakeholders about their views on the threats facing the Mangerton Brook, including Dorset Council, Wessex Water and the Environment Agency, amongst others. We did this in 2015 and updated it in 2021. The main issues are invasive species, channel morphology, particularly historical modifications and lack of natural processes.

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

1. The impact of invasive species, particularly Himalayan balsam
2. The impact of impoundments on the natural function of the river, particularly for fish

<sup>1</sup> <https://environment.data.gov.uk/catchment-planning/WaterBody/GB108044009600>



## Action

Through our engagement with organisations and individuals over the winter of 2020, several potential opportunities were highlighted for the Mangerton catchment. These are highlighted below:

- There are funding options available to farmers to help them manage their land better for the water environment. New schemes will be starting in 2024 that will have a greater focus on managing for the water environment but up until then existing Countryside Stewardship schemes are open for new applications and extensions, along with opportunities outlined in the Agricultural Transition Plan<sup>2</sup>. Of particular interest / relevance are:
  - Farming in Protected Landscapes: a grant programme to help farmers deliver projects that benefit, nature, climate, people and place. It runs until March 2024<sup>3</sup>.
  - Woodland Creation Grants from the Forestry Commission. There are high priority areas for woodland planting throughout the catchment that address water quality<sup>4</sup>.
  - Catchment Sensitive Farming<sup>5</sup>

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<sup>2</sup>

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/954283/agricultural-transition-plan.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/954283/agricultural-transition-plan.pdf)

<sup>3</sup> <https://www.dorsetaonb.org.uk/resource/farming-in-protected-landscapes/>

<sup>4</sup> <https://www.forestergis.com/Apps/MapBrowser/>

<sup>5</sup> <https://www.gov.uk/guidance/catchment-sensitive-farming-reduce-agricultural-water-pollution>