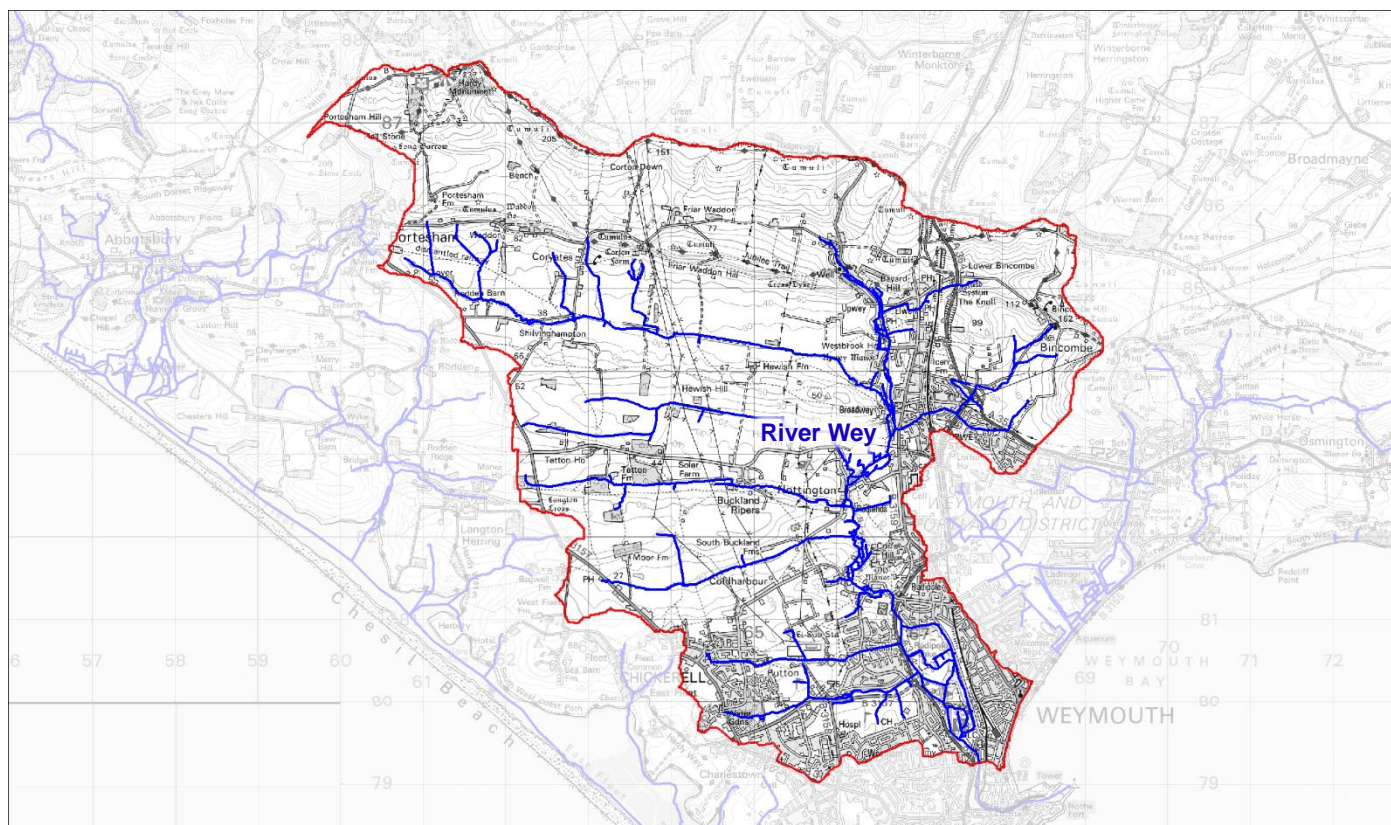


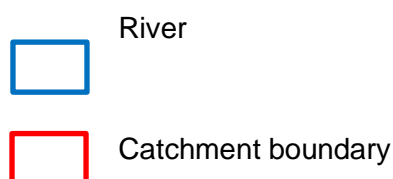


River Wey



Map of the River Wey catchment

Key



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Introduction

The River Wey rises near Portesham and flows eastward in a clay vale until Broadway, where it turns sharply south and cuts through mudstone and sandstones until it discharges into Weymouth Bay. The upper reaches are mixed agricultural, but the lower reaches are dominated by the urban centre of Chickerell and Weymouth.

The headwaters are in the Dorset Area of Outstanding Natural Beauty.

River length	12.37 km
Catchment area	43.28 km ²
Geology	Rises in clay and flows over mudstone and sandstone.
Land use	Agricultural and urban
Principle towns and villages	Portesham, Bincombe, Upwey, Broadway, Nottingham, Chickerell, Weymouth



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 Wey 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 River Wey.

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 cuts across many bands of rocks, all with different characteristics. It is quite a complex situation for such a small catchment, varying from sands and gravels through chalk and into limestones.

Exploring the rock groups from north to south:

The Bracklesham Group and Barton Group. A small outcrop of this group of rocks just creep into this catchment. The rocks are made up of sand, silt and clay, and were formed in shallow seas some 34 to 56 million years ago. They are the youngest rocks in the catchment.

Next comes the White Chalk. It was laid down in warm, shallow seas about 90-100 million years ago, during the cretaceous period and is made up of the skeletons of microscopic plankton.

Then there is the Purbeck Group, made up of limestone and mudstone formed approximately 140 to 151 million years ago in the Cretaceous and Jurassic Periods. They were laid down in marginal coastal plains made up of lakes and swamps.

Following on is the Portland Group of limestone and calcareous sandstone formed approximately 146 to 155 million years ago in the Jurassic Period in warm shallow seas.

Next is the West Walton Formation, Ampthill Clay Formation and Kimmeridge Clay Formation. These mudstones, siltstones and sandstones were laid down approximately 151 to 161 million years ago in the Jurassic Period in shallow seas.

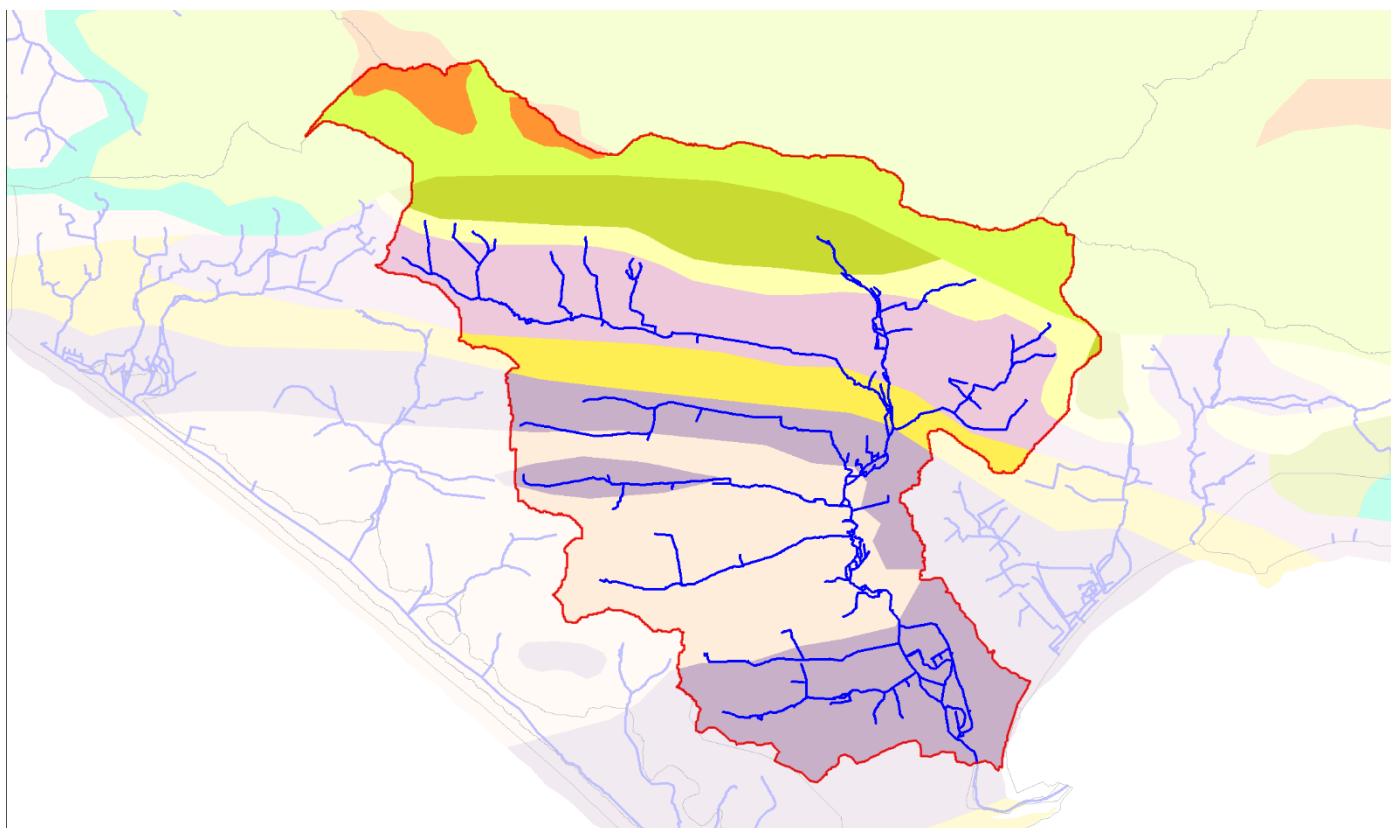
Next is the Corallion Group of limestones, sandstones, siltstones and mudstones, formed 156 to 161 million years ago in the Jurassic Period in warm shallow seas.

Followed by the Kellaways Formation and Oxford Clay Formation, made up of mudstones, siltstones and sandstone laid down 156 to 165 million years ago in shallow seas during the Jurassic Period.

Finally, there is the Great Oolite Group, made up sandstones, siltstones, mudstones and limestones, deposited in warm shallow seas rich in corals some 165 to 168 million years ago in the Jurassic Period.

No one rock type dominates, and the different properties of the rocks have led to the ridge and vale landscape of the area.

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



Map of the River Wey underlying geology

Key

-  River
-  Catchment boundary
-  Bracklesham Group and Barton Group; sand, silt and clay
-  White Chalk Subgroup
-  Purbeck Group; limestone and mudstone
-  Portland Group; limestone and sandstone
-  West Walton Formation, Ampthill Clay Formation and Kimmeridge Clay Formation: mudstone, siltstone and sandstone
-  Corallian Group; limestones, sandstones, siltstones and mudstones
-  Kellaways Formation and Oxford Clay Formation; mudstones, siltstones and sandstones

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



Great Oolite Group: sandstone,
limestone and argillaceous rocks



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 Wey catchment are very varied, reflecting the underlying geology and they go from very acid, through neutral to more alkaline.

There is no one dominant soil type, as characterised by Cranfield University's Soilscales, so the current uses and potential for wildlife is very varied. These are described below:

- 'Freely draining very acid sandy and loamy soils'. These freely drain to groundwater, have very low fertility and have medium carbon storage potential. They have potential for lowland heathland and are used for forestry with extensive grazing possible. The main risks to the water environment are erosion along footpaths.
- '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.
- '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.
- '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.
- 'Freely draining slightly acid but base rich soils'. They drain to groundwater, have high fertility and low carbon storage potential. They are suitable for base-rich pastures and deciduous woodland and are used for both arable and grassland. The main risks to the water environment are groundwater contamination with nitrate as well as siltation and nutrient enrichment of streams from soil erosion on certain of these soils.
- '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.
- 'Loamy and clayey floodplain soils with naturally high groundwater'. They are naturally wet and drain to the water table. They have moderate fertility and have medium carbon storage potential. They have the potential to host wet flood meadows with wet carr woodlands in old river meanders. They are used for grassland and some arable. The main risks to the water environment are their close proximity to rivers, resulting in increased pollution risk from floodwater scouring and drainage water after spreading of fertiliser or slurry.



- 'Saltmarsh soils'. They are naturally wet and drain to the sea. They are lime-rich but saline, with high fertility. They have low to medium carbon storage potential. They are ideal for coastal salt marsh vegetation and can be grazed but are mostly covered by natural vegetation.



Land use

The geology and soils of the Wey 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 Wey, 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 Wey 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 28% of the catchment area. Improved grassland will predominantly be used to support stock. 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 22% 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 cattle 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.

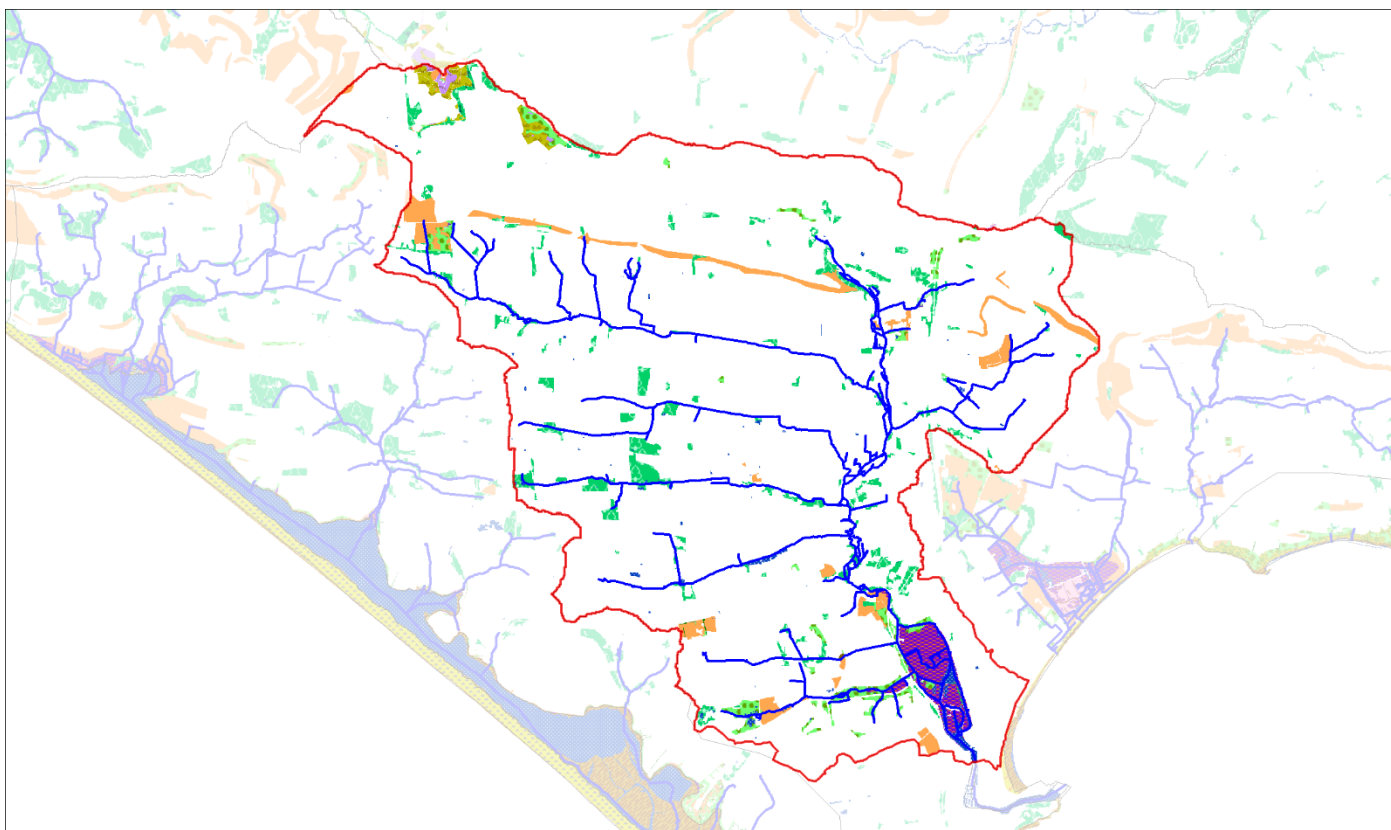
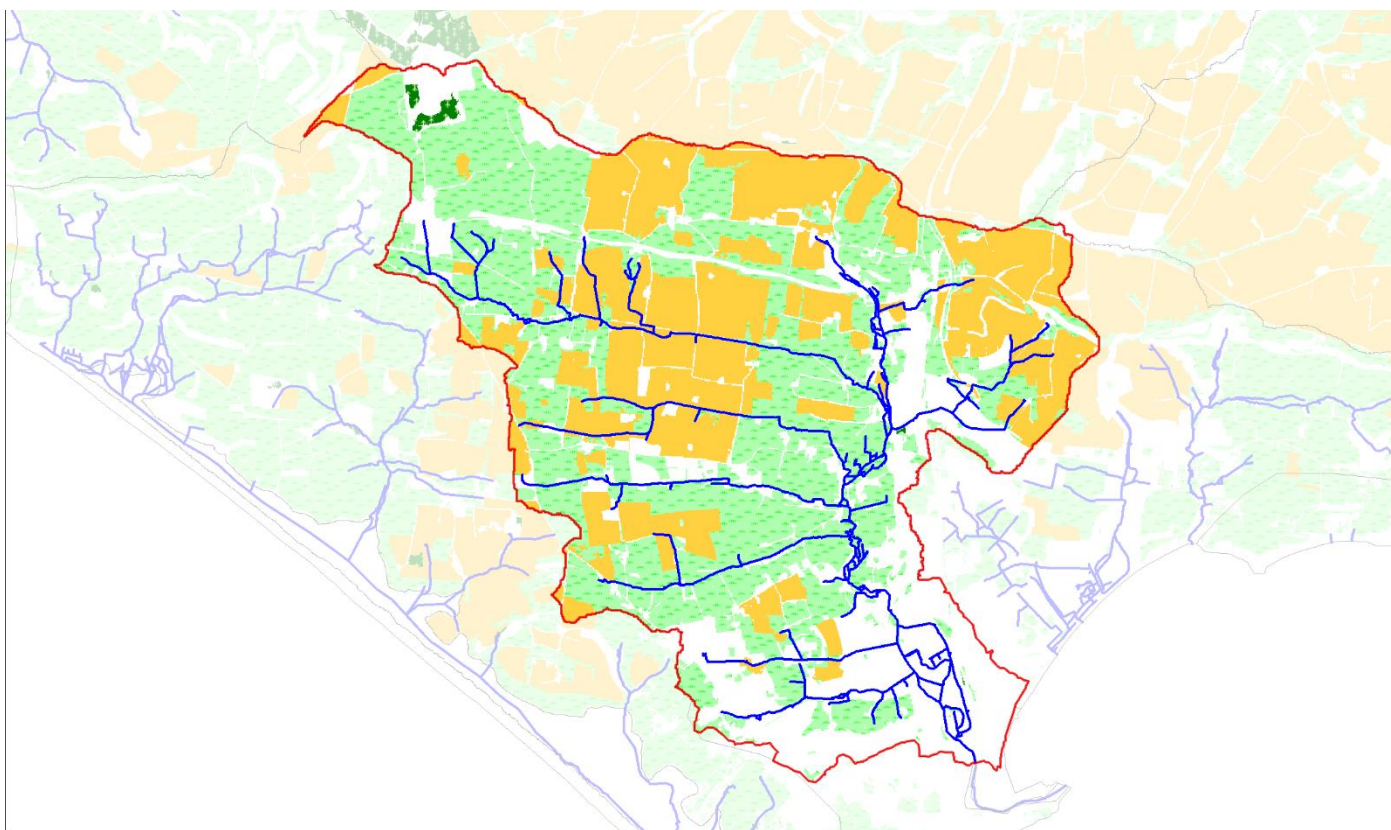
In total, intensive land use covers close to 50% of the catchment area and therefore has the potential to have effects on the water environment of the River Wey.

Extensive land use

Covering 6% 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 2.5%. The other significant category is semi-improved grassland, which covers 1.7% 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

The Wey is a very urban catchment, with over 41% of the area developed, along with an additional 1% that has been classified as gardens (though this category is hard to define because the individual areas are quite small). This limits the potential for restoring natural functioning within the catchment. 1% is water and there is a very small area of coastal habitat.





Map of the River Wey 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 Wey catchment are grassland and woodland. There are small areas of heathland in the headwaters and wetlands near the mouth of the river.

It is the government's ambition to have 30% of the land managed for wildlife. If we total the 'core' habitat blocks within the catchment, this gives us a total of 6%. There is, therefore, significant capacity for restoration and enhancement to help meet this target but has to be tempered with the highly developed nature of the catchment. Natural England also recognises that for a site to function naturally, it should be at least 40ha in size. There are no habitat blocks above this size in the catchment.

Grassland

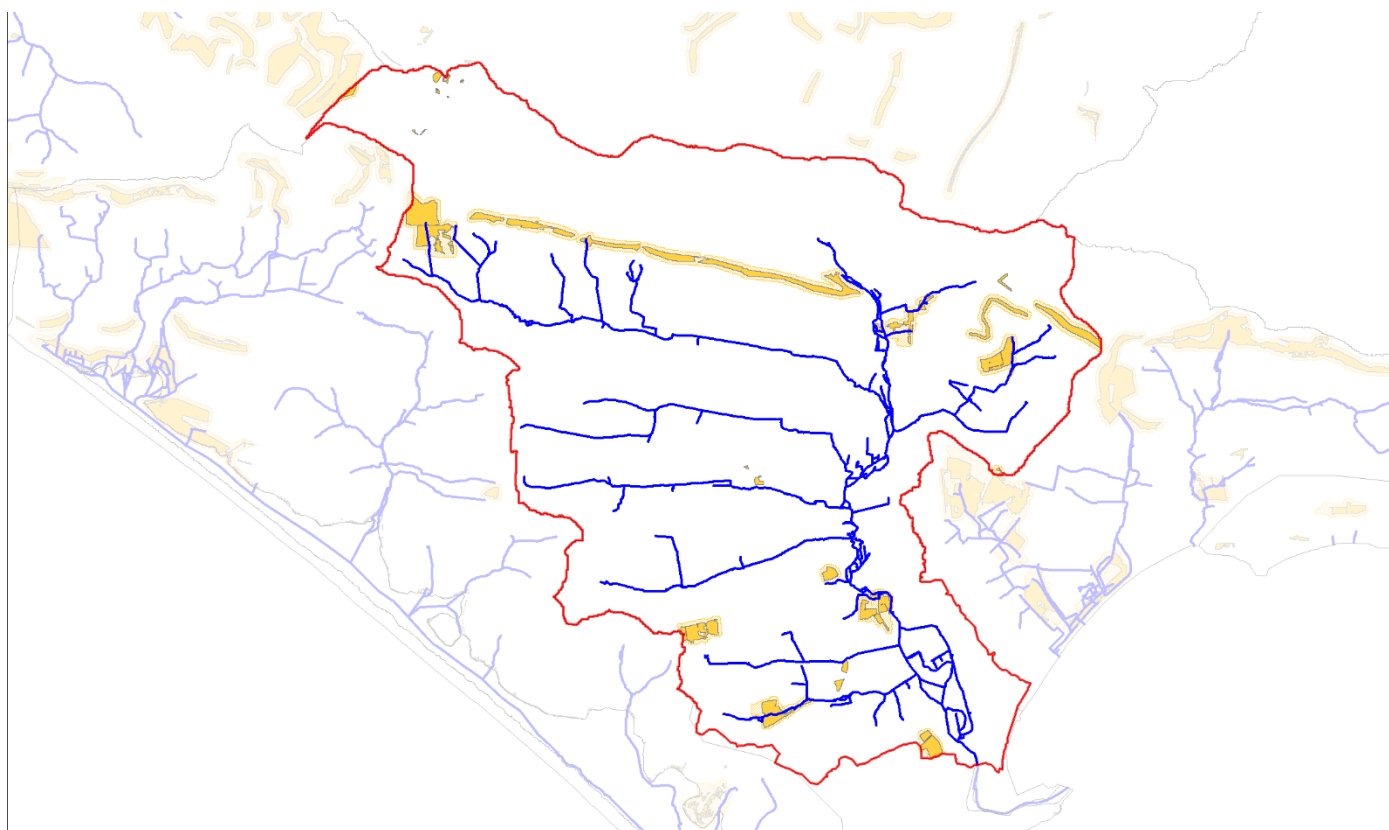
105 ha of 'core' and 'stepping stone' habitat exist within the catchment over 59 locations, none of which are over 40ha. These are mostly on the steeper slopes in the catchment. These sites support a grassland ecological network (for an average medium dispersal species) of 227ha over 11 locations.

Woodland

199 of 'core' and 'stepping stone' habitat exist within the catchment over 138 locations, none of which are above 40ha. These are concentrated along the margins of the watercourse itself. These sites support a woodland ecological network (for an average medium dispersal species) of 493ha over 41 locations.





Heathland and wetland

Heathland sites are tightly restricted to specific underlying soils and geology. There is little opportunity for restoration and enhancement within the catchment. There are 48 ha of wetland sites at Radipole, which is a significant area compared to other catchments, but there is still little opportunity for expansion of this habitat.

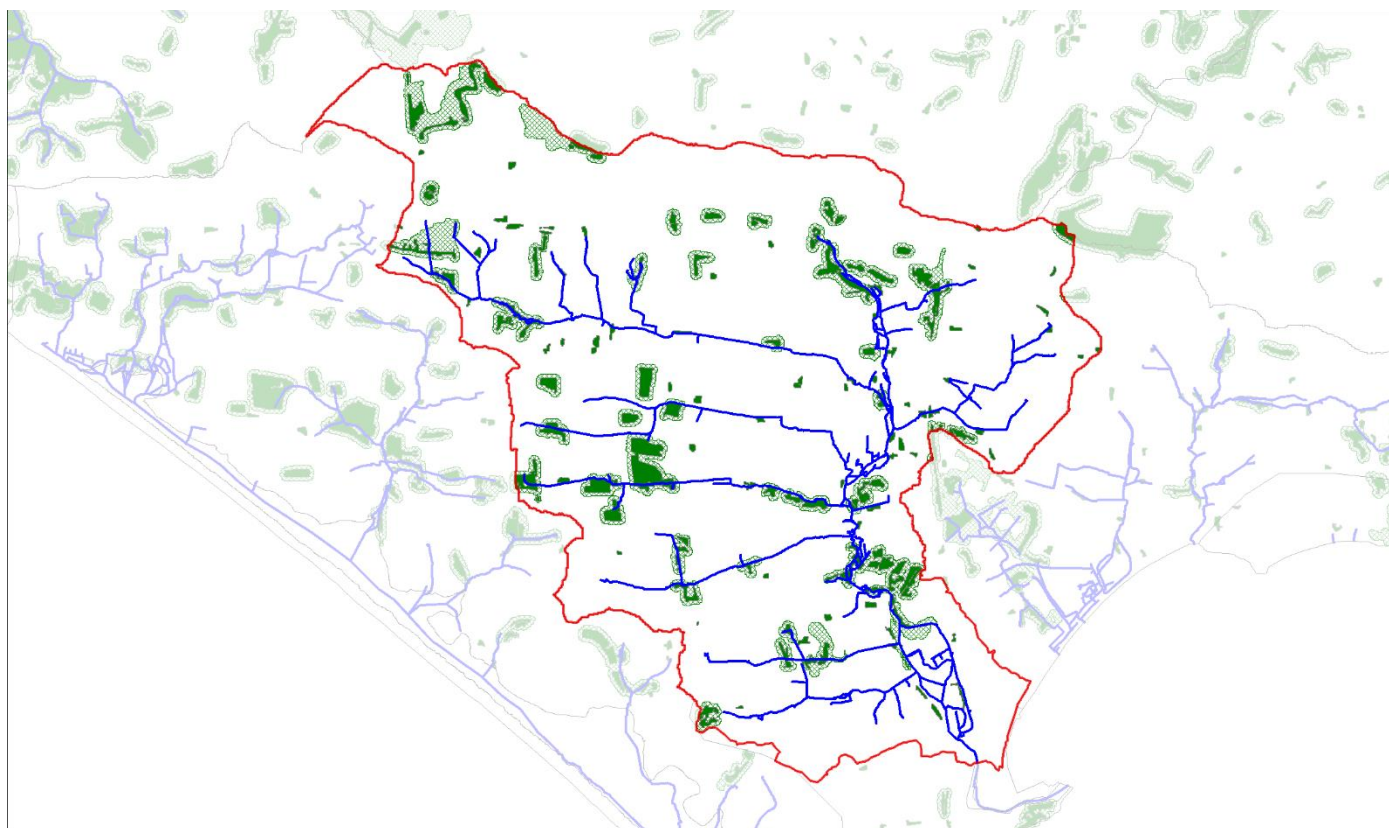


Map of the River Wey catchment grassland ecological network

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 Wey catchment woodland ecological network

Key

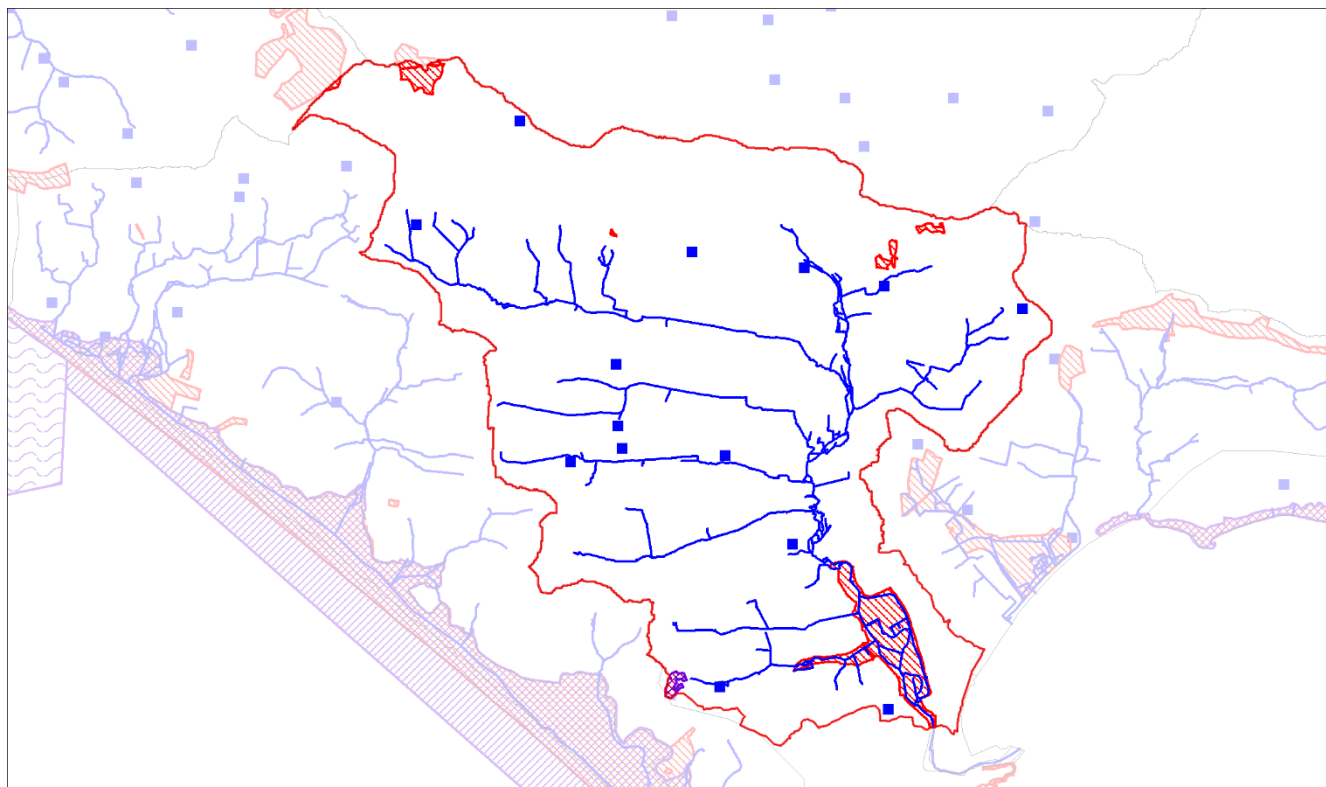
-  River
-  Catchment boundary
-  Woodland core (>1ha) and stepping stone (<1ha) sites
-  Woodland ecological network for a medium dispersal species

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


Designations

There are five Sites of Special Scientific Interest (SSSI) within the catchment, covering approximately 129ha. These are Blackdown (Hardy Monument) SSSI, Corton Cutting SSSI, Crookhill Brickpit SSSI, Radipole Lake SSSI and Upwey Quarries and Bincombe Down SSSI. There is also a small part of the Valley of Stones SSSI. Crookhill Brickpit is also a Special Area of Conservation. There are 14 Sites of Nature Conservation Interest covering approximately 122ha.



Map of the River Wey 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 the River Wey into categories that reflect their overall condition. These are **High** > **Good** > **Moderate** > **Poor** > **Bad**. The Wey is categorised as **Moderate**. The aim is to have waterbodies classed as Good, so the Wey is currently considered to be a failing watercourse. It was also classified as Moderate in 2013, 2014 and 2016 In 2015 it was classified as Poor.

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 website¹.

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

The specific elements that are currently failing are:

- 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. Little is currently known about the impacts of the hazardous substances on wildlife, and this an area of further work for the Environment Agency.

The Environment Agency have identified the following threats to the River Wey:

- Physical modifications impacting the ability of fish move freely through the habitat.
- More information is needed to understand the sources of PBDE and Mercury.

Local assessment:

To get a local perspective, we consulted other stakeholders about their views on the threats facing the River Wey, including Dorset Council, Wessex Water and the Environment Agency, amongst others. We did

¹ <https://environment.data.gov.uk/catchment-planning/WaterBody/GB108044010210>



this in 2015 and updated it in 2021. The main issues are flooding, over abstraction, rural runoff issues, phosphate leading to algal blooms, invasive species, and barriers to fish passage.

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

1. Flooding
2. Rural runoff issues
3. Phosphates, leading to algal blooms
4. Physical modifications that impact the ability of the river to function naturally
5. Flooding



Action

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

- Wessex Water are developing Drainage and Waste Water Management Plans² that set out how Wessex Water will enhance their assets and networks to ensure they continue to deliver for their customers and the environment in a sustainable and affordable way and in the face of future challenges such as population growth and climate change. Combined Sewage Overflows have discharged a number of times over the past three years, but not above a threshold where further action would take place.
- Litter Free Coast & Sea³ are working with agencies, businesses and local groups to engage with communities surrounding beach locations and find collaborative solutions that improve everyone's enjoyment of Dorset beaches. Currently this does not include Weymouth Beach but may do in the future.
- 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 Plan⁴. 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 2024⁵.
 - Catchment Sensitive Farming⁶

² <https://wessexwater.maps.arcgis.com/apps/MapSeries/index.html?appid=e371301c24ca4228b36db3a3a6ba8560>

³ <https://www.litterfreecoastandsea.co.uk/current-projects-and-campaigns/beach-profiles/>

⁴

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/954283/agricultural-transition-plan.pdf

⁵ <https://www.dorsetaonb.org.uk/resource/farming-in-protected-landscapes/>

⁶ <https://www.gov.uk/guidance/catchment-sensitive-farming-reduce-agricultural-water-pollution>