



State of the River Char and
Monkton Wyld Stream

Dorset Wild Rivers Partnership

09/11/2021



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This project was delivered by Dorset Wild Rivers, a partnership of the Dorset Area of Outstanding Natural Beauty, Dorset Wildlife Trust and Farming and Wildlife Advisory Group SouthWest, with the support of the Dorset Catchment Based Approach, Environment Agency and Wessex Water.

Funders:



Report version: 1.0 FINAL

Date: 09/11/2021

Cover photo: Beautiful demoiselle on the River Char © Nick Gray



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Executive summary

This report was initiated by Char Valley Parish Council (CVPC) and compiled during 2021 by the Dorset Wild Rivers Partnership, drawing on many sources including CVPC residents & farmers, Dorset Wildlife Trust (DWT) and the Environment Agency (EA). It can be read, in full, on the CVPC website:

www.charvalley.org.

The River Char and Monkton Wyld Stream health status is judged to be **Moderate** (which means that they are both considered to be failing watercourses). Historical EA reports from 2000 identify pollution from agriculture, from roads, invasive species, disease of Alder trees and poor conditions for wildlife as the main issues. Further concerns about land management, habitat and sewerage and health & safety issues associated with bathing water quality downstream at the mouth of the River Char have been expressed in the EA's Water Framework Assessment, by Char Valley Parish Council and voiced by local residents.

The current areas of most concern, as identified by EA and other agencies, local people and those working in the area, are:

1. Sediment and phosphate contamination from agriculture
2. Phosphate / sewage pollution from septic tanks
3. Flash flooding
4. Poor habitat for wildlife
5. The impact of invasive species, particularly Himalayan balsam
6. The desire for the river to function as naturally as possible, but without causing issues downstream

Further details of concerns and opportunities are given in the report under the 'Areas of investigation' headings of land management, sewerage, flow, habitat, and morphology (pages 25-35)

An action plan has been drawn up involving proposed support from the community, professional advisory work with land managers and engagement with other organisations and individuals, for example Wessex Water, Litter Free Coast & Sea, Forestry Commission, and various funding schemes. The actions are set out under the following headings:

1. Monitoring
2. Habitat improvement & restoration
3. Invasive species control
4. Research & survey
5. Community engagement
6. Agricultural land management change
7. Natural Flood Management



Introduction

Commission

In 2021, Char Valley Parish Council commissioned Dorset Wild Rivers Partnership to investigate the state of the River Char and Monkton Wyld Stream. This report summarises their findings.

Background

The source of the Char is said to be on the flanks of Lewesdon Hill, but other tributaries run down from Bettiscombe and Marshwood village. Its valley quickly broadens to become the Marshwood Vale which, as its name suggests, is characterised by clay soils and lies wet for much of the year. It is a ‘flashy’ catchment with rapid runoff, and this rapid runoff gives it an energy that means it is a relatively active river, mobilising gravels from glacial deposits and old river channels as it cuts across the landscape. Its character varies, from a steep channel in the headwaters, with little floodplain, to a more meandering channel with wider floodplain as it reaches the sea.

The Monkton Wyld Stream catchment holds a number of channels, including those that flow from Wootton Fitzpaine, Wootton Cross and Hogchester, as well as that from Monkton Wyld.

The Char is approximately 16 km long. The Monkton Wyld Stream approximately 7km. Almost the entire catchment is in the Dorset Area of Outstanding Natural Beauty.

Medium to large dairy units dominate much of the area with agricultural land use in the catchment being nearly all permanent and temporary grassland. The exception to this is maize cultivation, the extent of which varies from year to year. In the headwaters of the Monkton Wyld Stream there is also extensive coverage of woodland. There are significant patches of SSSI and SNCI grassland.

It is a renowned pastoral landscape with bountiful hedges and hedgerow trees, and the catchment is rimmed with characterful hill forts. The rivers are not formally fished and, it is believed, have never been stocked, resulting in an unusually ‘natural’ brown trout population of high conservation value.

Combined main river length	20.94 km
Combined catchment area	56.87 km ²
Geology	The Char rises on clay and flows through mudstone for the majority of its course. The Monkton Wyld Stream has significant areas of greensand in the headwaters before flowing over clay.
Land use	Intensive dairy dominates land use. Significant areas of woodland in the headwaters of the Monkton Wyld Stream.
Principal towns and villages	Pilsdon, Bettiscombe, Marshwood, Fishpond Bottom, Whitchurch Canonicorum, Morecombelake, Charmouth, Wootton Fitzpaine

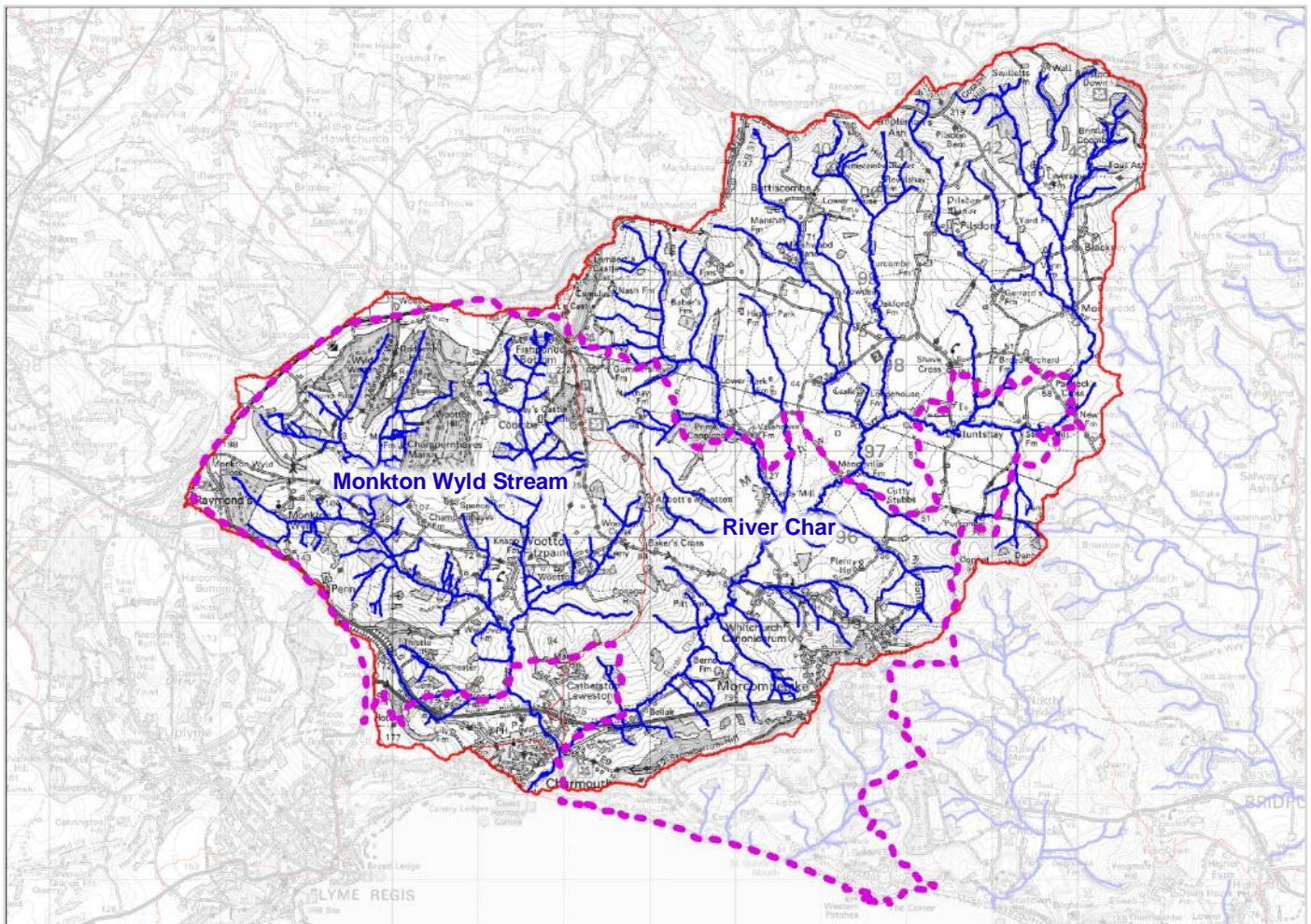
No river in England is in pristine condition, and it is the responsibility of the Environment Agency to monitor how far from pristine the condition of our waterbodies has deviated. It is up to us to tackle the issues affecting the River Char and Monkton Wyld Stream to make a difference on the ground (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 processes, it is possible to make



meaningful improvements to the condition of the water environment, and ultimately the wellbeing of communities of the Char Valley Parish.




The next sections explore the state of the two rivers and their wider catchment, the areas that have been identified as at risk as suggested by 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 Char and Monkton Wyld Stream.

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.



Map of the River Char and Monkton Wyld Stream catchment

Key

-  River
-  Catchment boundary
-  Group Parish boundary

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How to use this document

In the following sections, we go into more detail about the issues and impacts faced by the River Char and Monkton Wyld Stream, as well as suggesting some responses that the community could deliver. We also explore the state of the wider environment because this can be both a source of the threats facing the water environment, such as sediment-laden runoff, or a solution to them, such as woodland planting that reduces flood risk. It is also important to consider the environment beyond the river corridor as activity far away from the waterbody can have an effect, if connected by ditches, roads, and other flow pathways.

The three main sections of the report are: Environment, Issues & Impacts, Action. The Environment section describes the geology and soils, as this dictates how water behaves in the catchment and what the land can be used for. It also describes the coverage of both intensive and extensive land use as well as how well the landscape functions for wildlife. It is important to understand this, as improving the functioning of the wider natural environment will benefit the water environment, as set out in the Box 1. The Issues & Impacts section explores, in more detail, the EA assessment of the waterbody and which issues are important to those who live and work in the area. The Action section highlights any known opportunities to improve the water environment and suggests some actions that can be delivered by communities and will make a difference.

Both the Environment section and Issues and Impacts section cover the whole catchment from source to sea. The Action section will focus on action within the Char Valley Parish boundary.

Box 1: Working with Natural Processes

Healthy catchments store and filter water in the landscape and slow the flow of water downstream. However, modern river landscapes are very different from what nature intended. We have lost water storage and filtration in wetlands, created hard surfaces that water can rush off, and changed our river channels so they move water very quickly. Our rivers are less able to cope with the rain we have now and expect in the future, making flooding and pollution more likely to impact communities and the wider environment.

By working with natural processes, we can better protect ourselves from hazards such as flooding and pollution. The term doesn't have a tight definition and is a catch-all for a variety of measures that includes tree planting, riverbank restoration, building small-scale woody dams, reconnecting rivers with their floodplains and storing water temporarily on open land.

An additional benefit of restoring natural processes is that it will also help wildlife thrive. It is because of this that we use as a focus, Natural England's objective of having 30% of an area as functioning habitat. If we achieve this by restoring natural processes in the right place, we will not only have thriving plants and animals, but the water environment will also be better protected.



1 : Environment

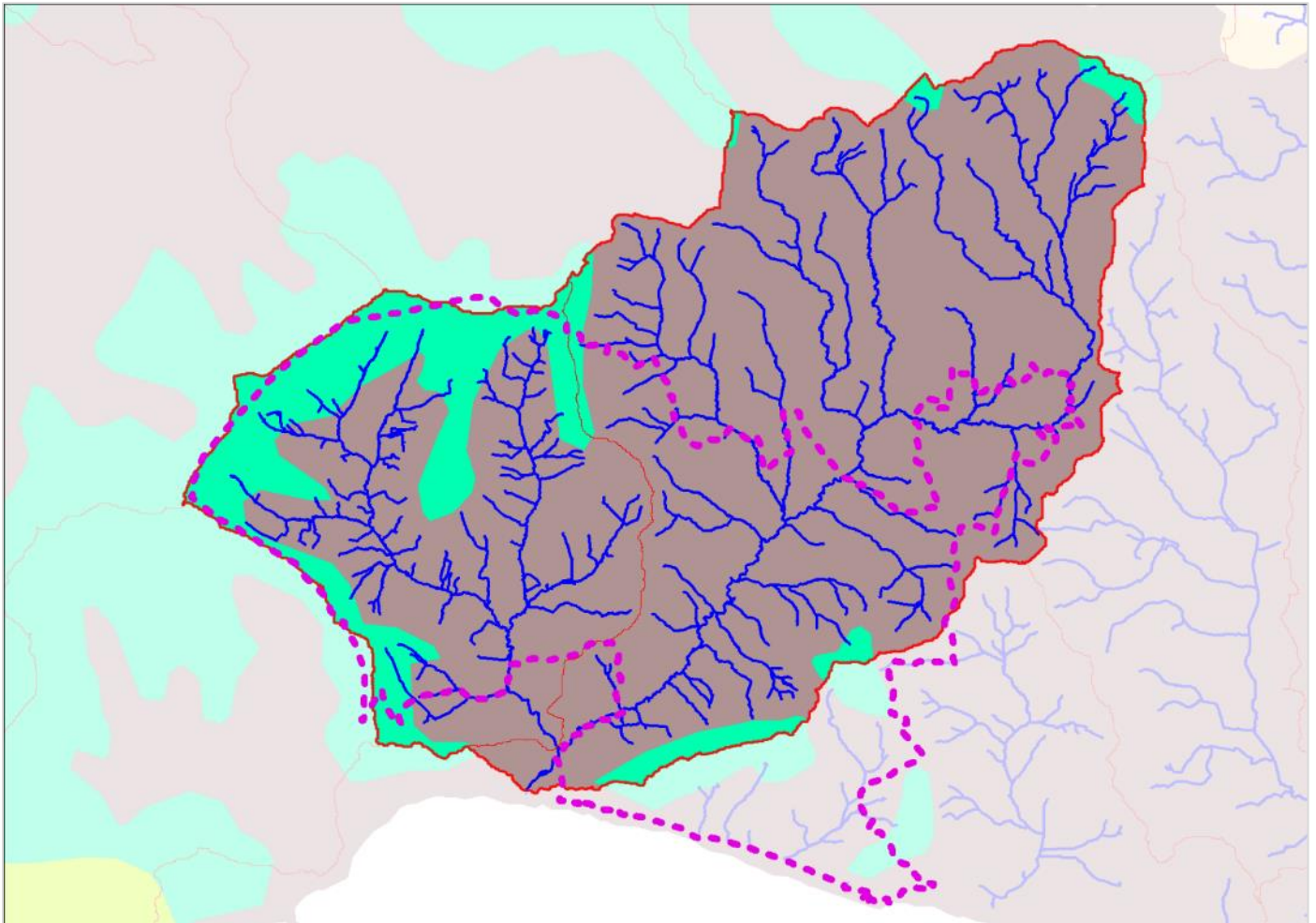
Geology

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 are pockets of the Gault Formation and Upper Greensand Formation, which are again made up of mudstones, sandstones and limestone. These were formed in shallow seas between 94 and 112 million years ago in the Cretaceous Period.






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

The map on Page 9 shows the extent of the geology within the catchment.



Map of the River Char and Monkton Wyld Stream underlying geology

Key

-  River
-  Catchment boundary
-  Group Parish boundary
-  Lias Group: mudstone, siltstone, limestone and sandstone
-  Gault Formation and Upper Greensand Formation: mudstone, sandstone and limestone,

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Soil types

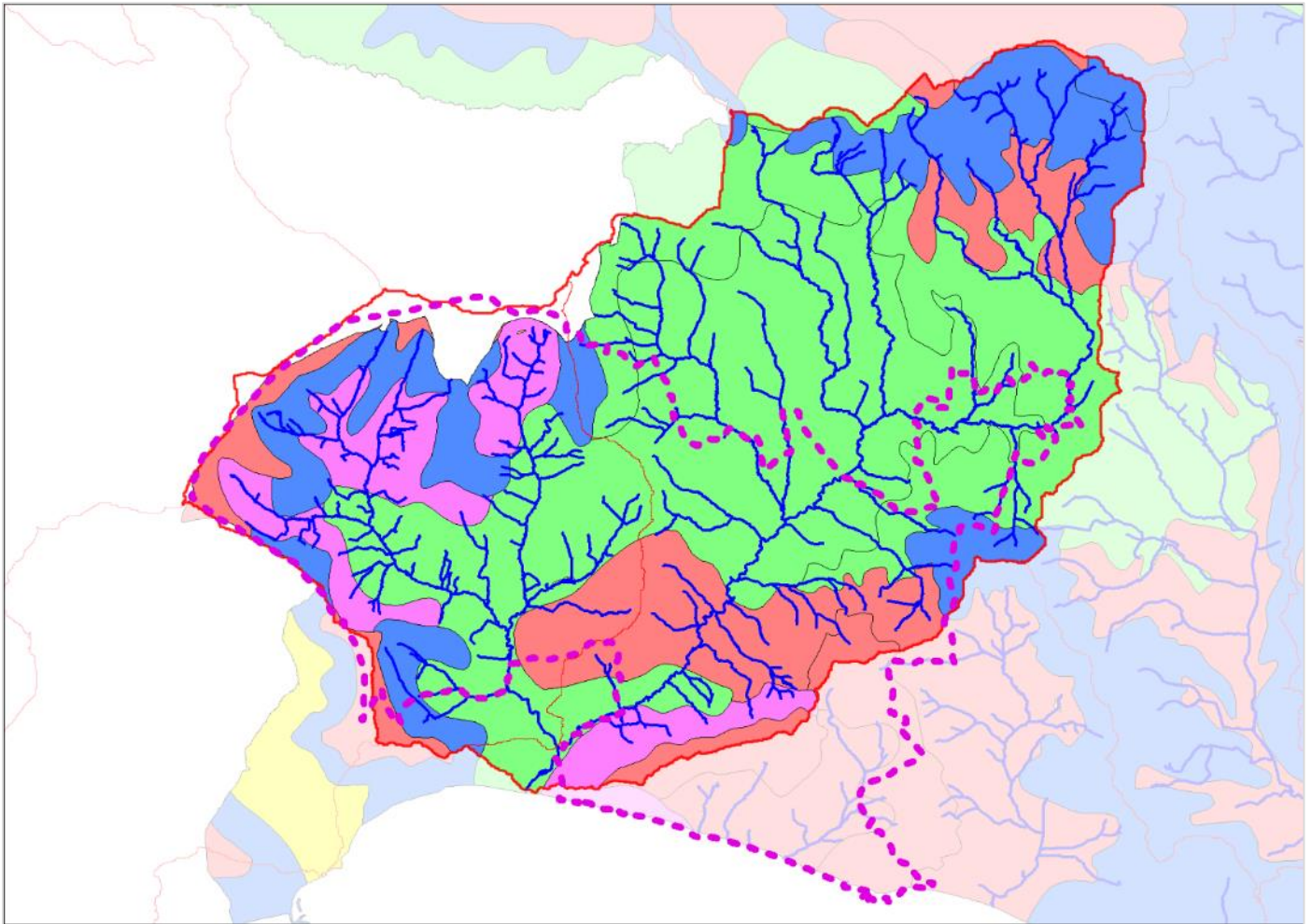
Heavily influenced by the underlying geology, soils are at the interface between biotic (living) and abiotic (non-living) worlds. These are important stores of carbon and biodiversity in their own right and provide the foundations from which others can grow. The characteristics of soil dictate what can 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 Char and Monkton Wyld catchment are mostly neutral with some acid.

The dominant soil type (Soilscape 18), as characterised by Cranfield University's Soilscales, is '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.

Other soils in the catchment are:





- Soilscape 6: 'Freely draining slightly acid loamy soils'. These are freely draining to local groundwater and rivers and have low fertility and low carbon storage potential. They are suitable for neutral and acid pastures and deciduous woodlands; and can be used for arable and grassland. The main risks to the water environment are groundwater contamination with nitrate; siltation and nutrient enrichment of streams from soil erosion on certain of these soils.
- Soilscape 8: '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 and rapid through-flow; surface capping (compaction of soils caused by machinery or stock) can trigger erosion of fine sediment.
- Soilscape 16: 'Very acid loamy soils with a wet peaty surface'. Peat can store water all year round, but the underlying soils can become dry. They feed into the surrounding stream network. They have low fertility with high carbon storage potential. They host grass moor and heather moor with flush and bog communities in wetter parts. They can be used for rough grazing, forestry and grassland. The main risks are drainage or over grazing, particularly in winter, leading to accelerated erosion. Out-wintering and stock feeding practices need care if loss of vegetation and erosion are not to result.

The map on Page 11 shows the extent of the Soilscales in the catchment.



Map of the River Char and Monkton Wyld Stream catchment soils

Key

-  River
-  Catchment boundary
-  Group Parish boundary
-  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 16: very acid loamy upland soils with a wet peaty surface

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



Land use

The geology and soils of the Char and Monkton Wyld catchment has 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. 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 Char and Monkton Wyld Stream, 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 Char and Monkton Wyld 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 61% of the catchment area. This is a high percentage. 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 9% 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 practices can mitigate these risks, by, for example, growing cover crops that bind soils together.

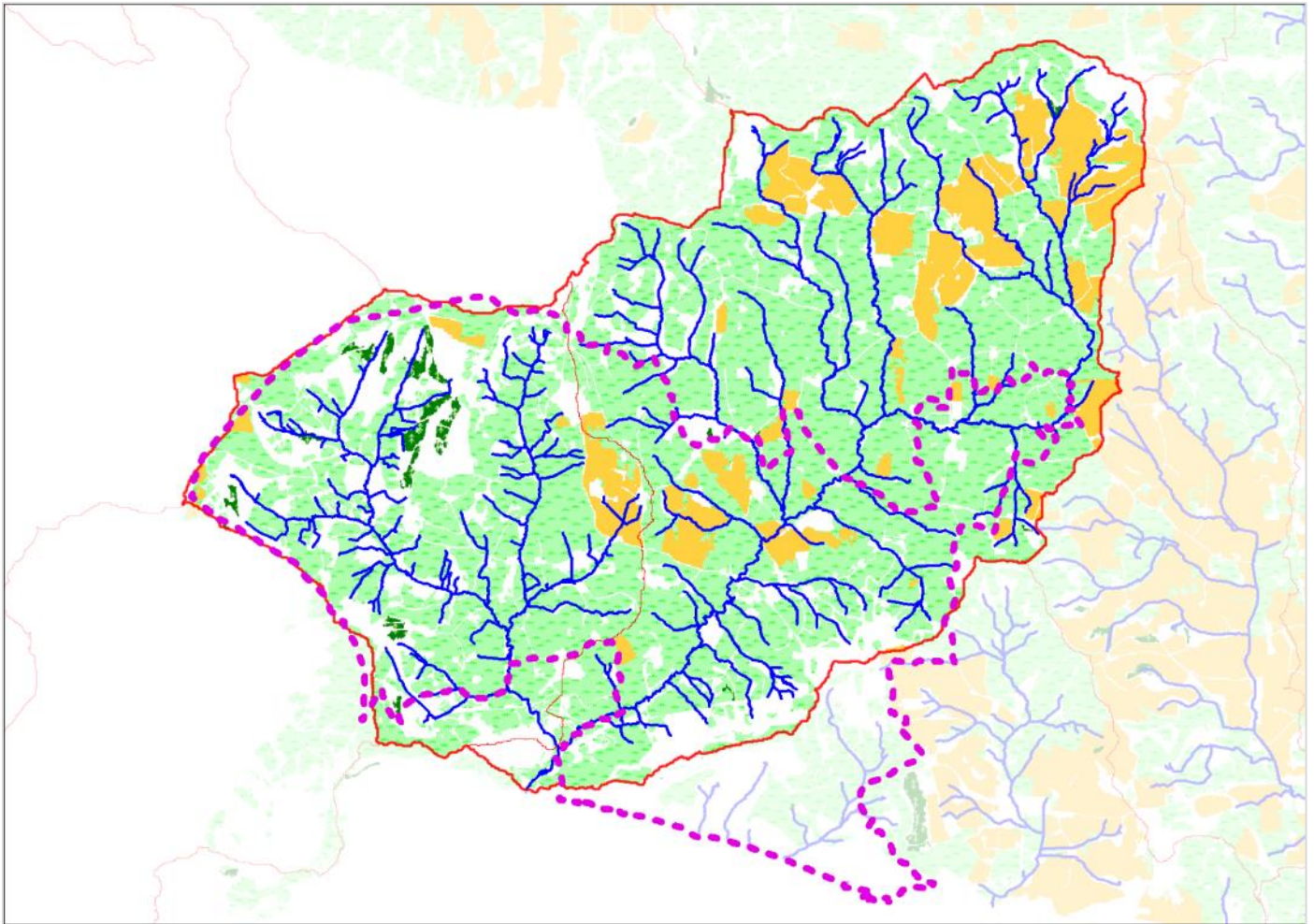
In total, intensive land use covers 72% of the catchment area and therefore has the potential to have significant effects on the water environment of the River Char and Monkton Wyld Stream.

Extensive land use

Covering the majority of the remaining 28% 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 14%. The other significant category is semi-improved grassland, which cover 3% 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 not being as intensively managed, it holds great potential for restoration back to semi-natural habitat.

Other land use




Urban land cover takes up 7% 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 and there is a very small area of coastal habitat.



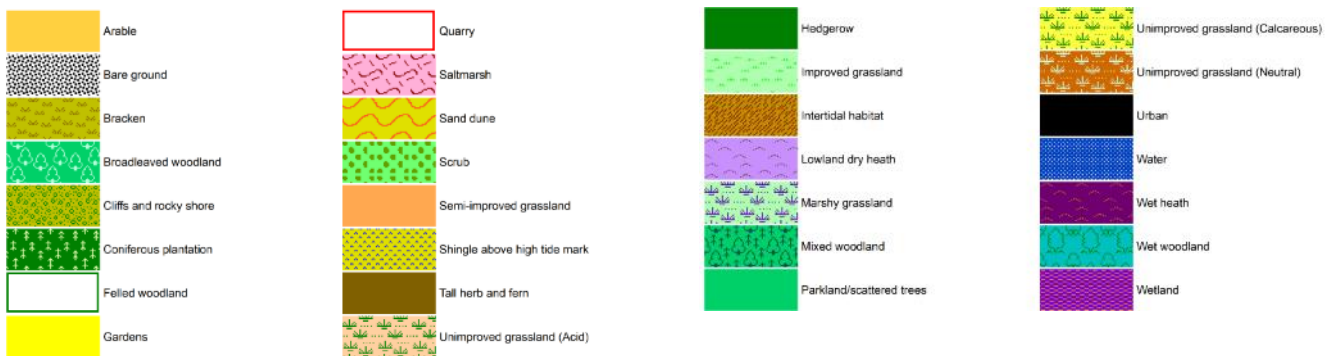
Map of the River Char and Monkton Wyld Stream catchment: intensive land use

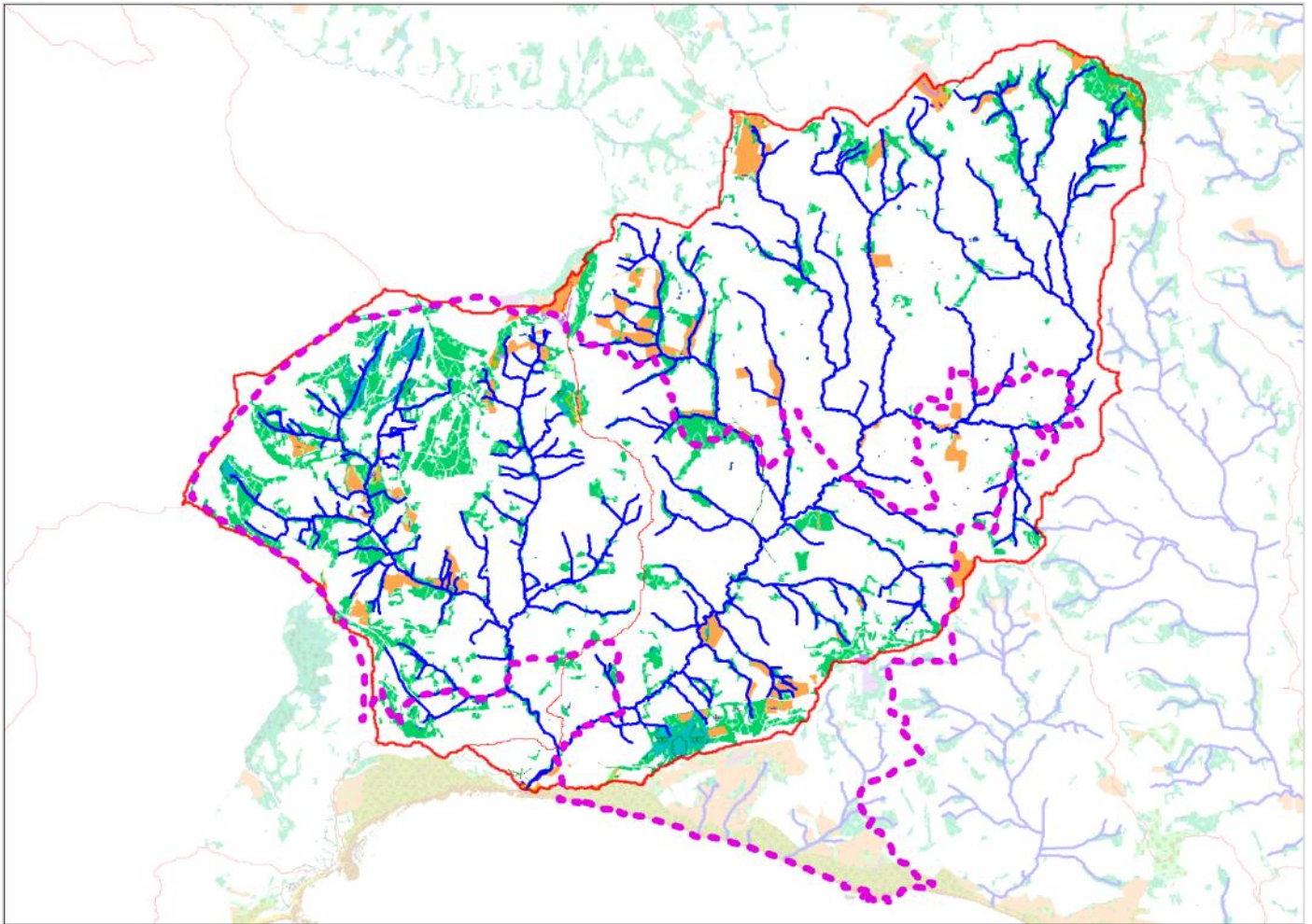
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Key

-  River
-  Catchment boundary
-  Group Parish boundary

Land use categories








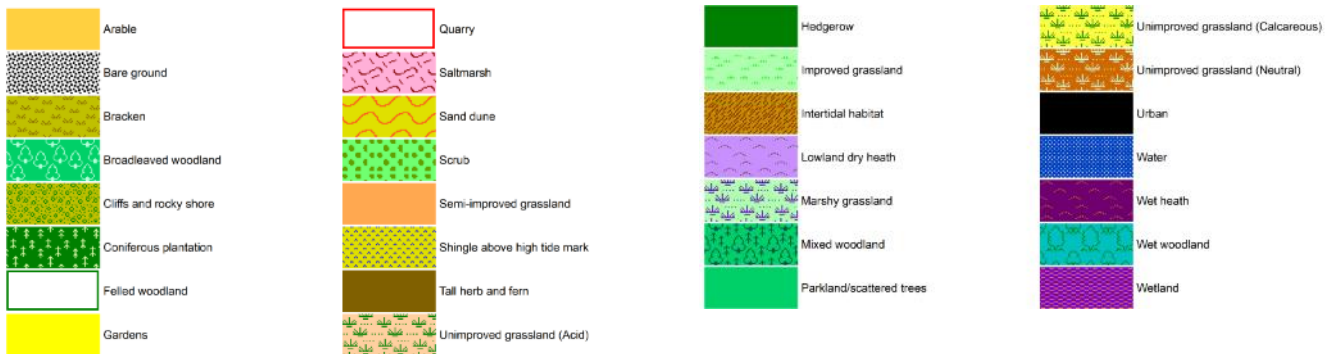
Map of the River Char and Monkton Wyld Stream catchment: extensive land use

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Key

-  River
-  Catchment boundary
-  Group Parish boundary

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 Char and Monkton Wyld catchment are grassland and woodland. There are small areas of heathland that straddle the boundary, associated with the greensand geology, and two wetland sites near the mouth of the river.

It is the government's ambition to have 30% of the land managed for wildlife. If we add up the 'core' habitat blocks within the catchment, this gives us a total of 22%. There is, therefore, significant capacity for restoration and enhancement to help meet this target. Natural England also recognise that for a site to function naturally, it should be at least 40ha in size. There are 28 blocks over this threshold, the majority in the Monkton Wyld catchment. There are no grassland units above this threshold.

Grassland

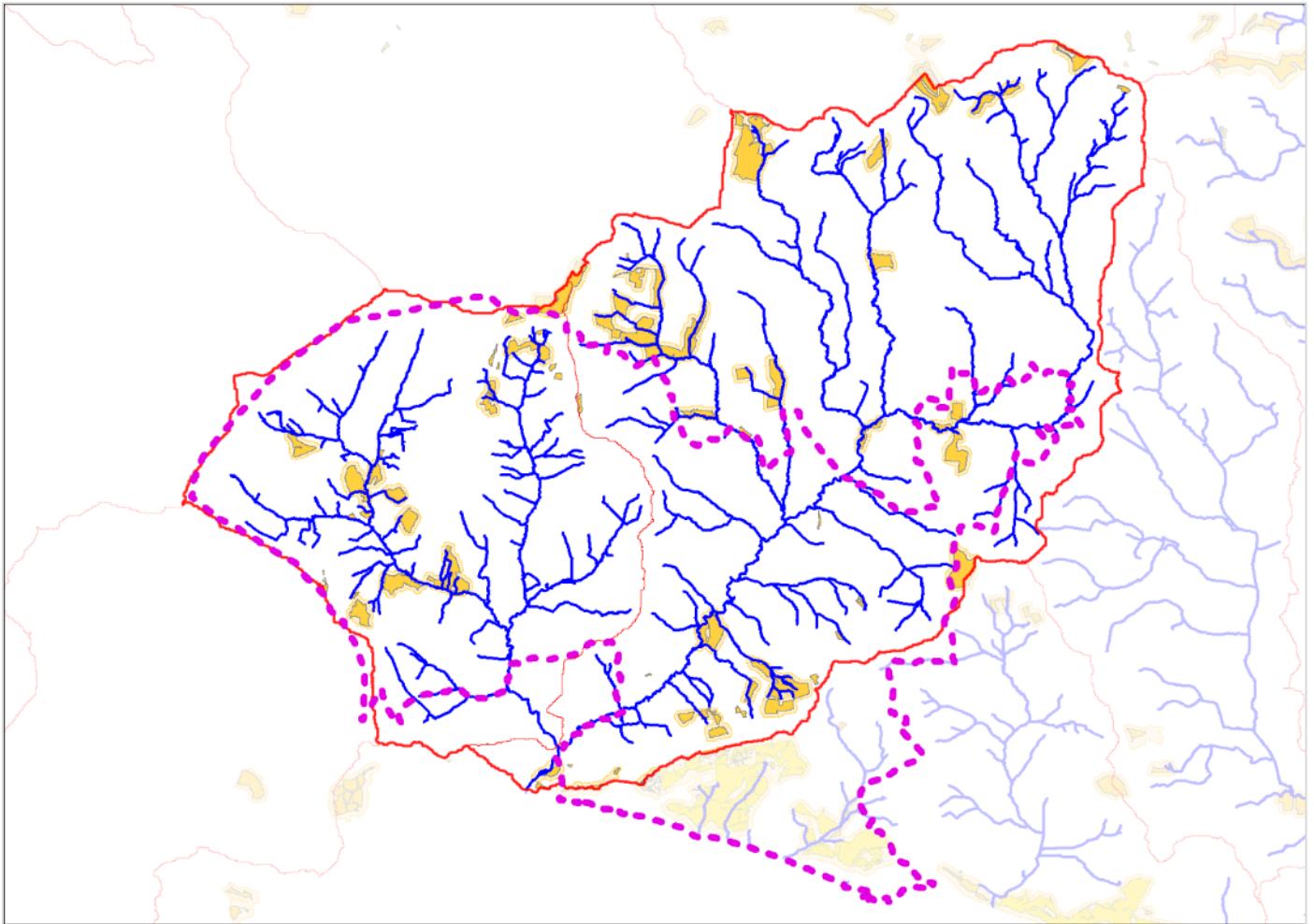
190ha of 'core' and 'stepping stone' grassland habitat exist within the catchment over 101 locations, none of which are over 40ha. These are mostly in the headwaters of the river on the steeper slopes. These sites support a grassland ecological network (for an average medium dispersal species) of 413ha over 30 locations.

Woodland

1061 ha of 'core' and 'stepping stone' woodland habitat exist within the catchment over 225 locations, 28 of which are above 40ha. For the Char, these are in the headwaters and along the watercourse itself. For the Monkton Wyld Stream, these are in the headwaters, associated with poorer quality soil. These sites support a woodland ecological network (for a species that is neither able to disperse widely, such as a bird, or that is stationary, such as a tree, but that is somewhere in the middle, such as a butterfly) of 2,400ha over 52 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 very few wetland sites within the catchment, which means species reliant on this habitat are poorly serviced in the Char and Monkton Wyld catchment.

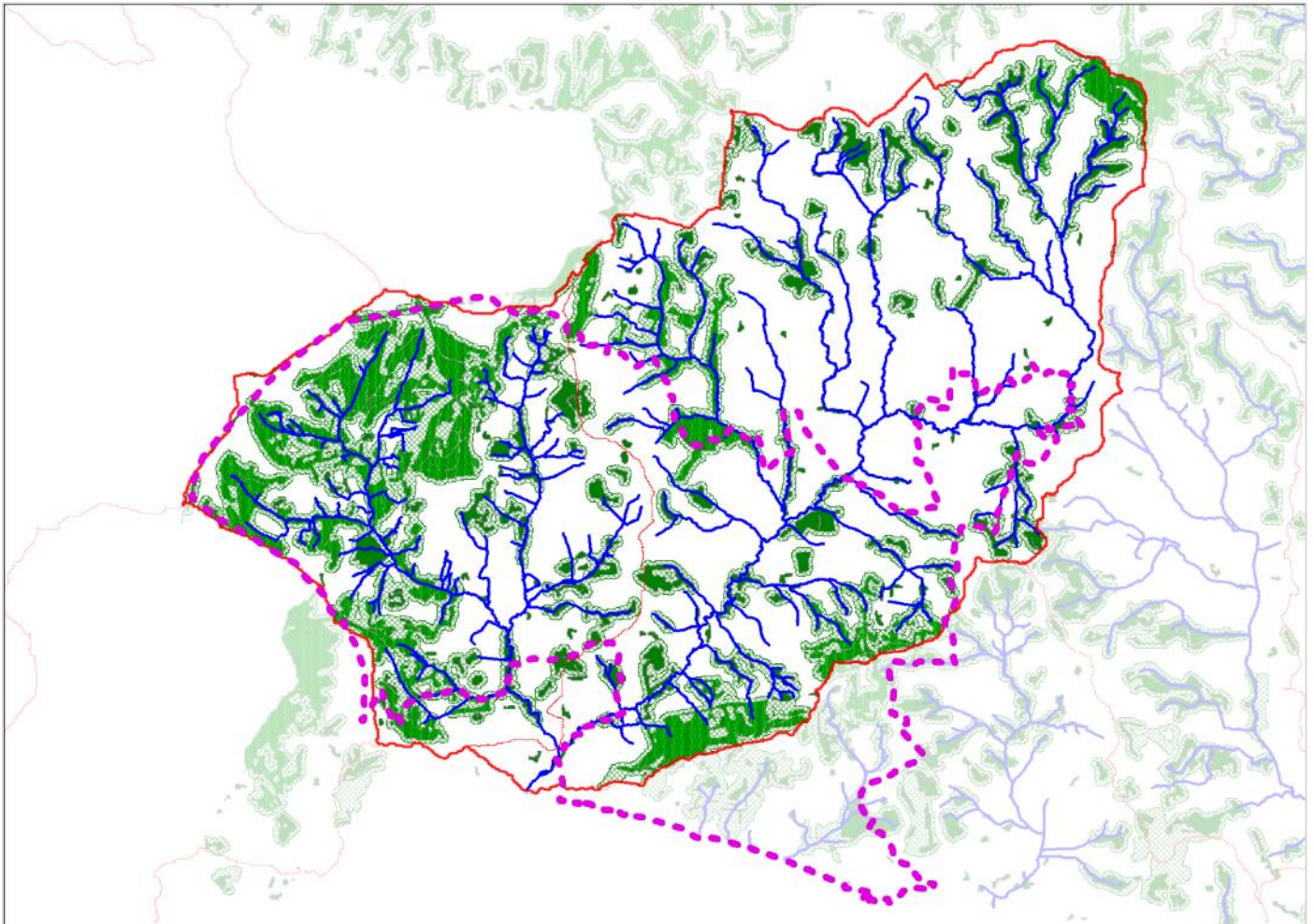


Map of the River Char and Monkton Wyld Stream catchment grassland ecological network

Key






-  River
-  Catchment boundary
-  Group Parish 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 Char and Monkton Wyld Stream catchment woodland ecological network

Key

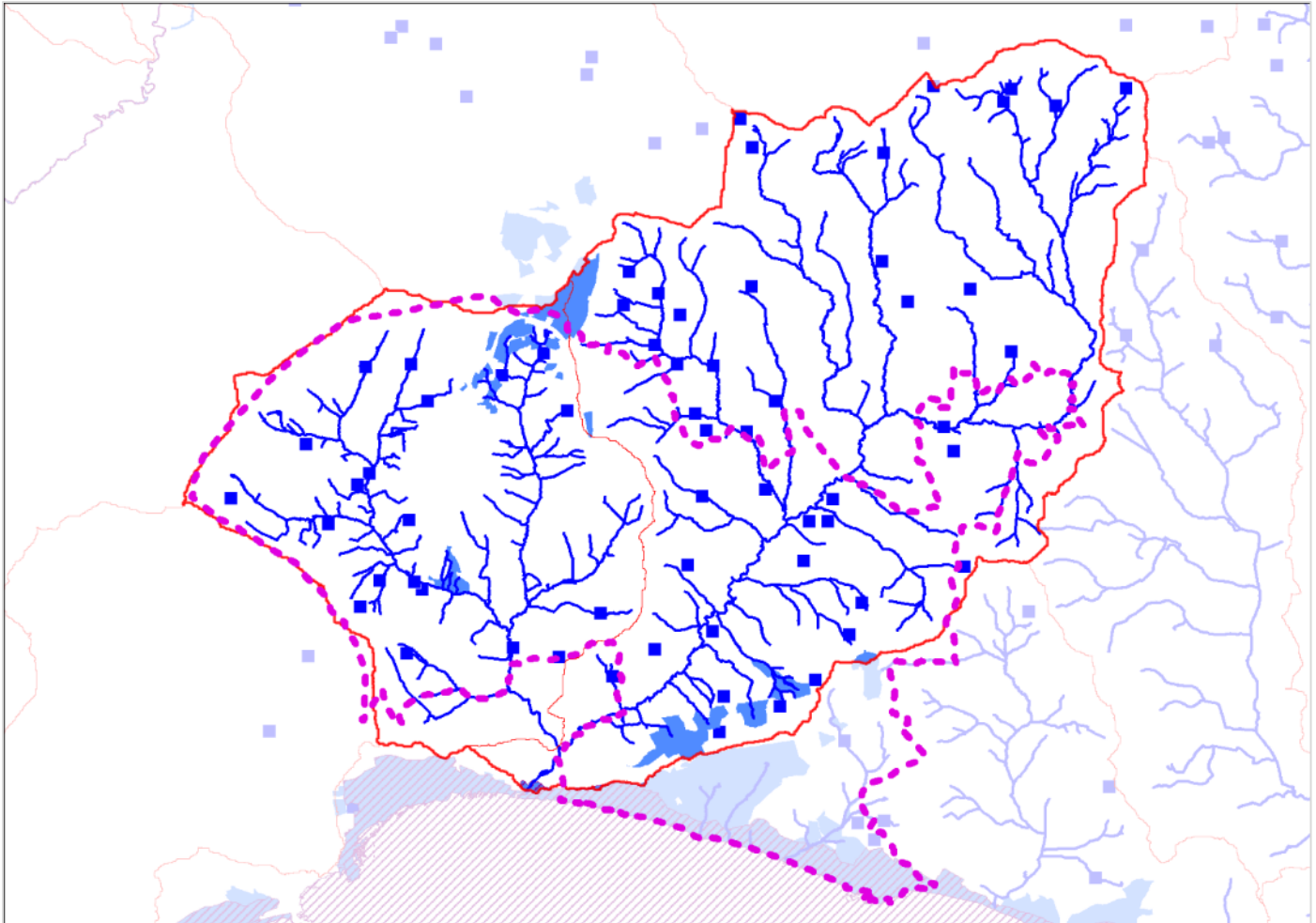
-  River
-  Catchment boundary
-  Group Parish boundary
-  Woodland core (>1ha) and stepping stone (<1ha) sites
-  Woodland ecological network for a medium dispersal species

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Designations

There are parts of four Sites of Special Scientific Interest (SSSI) within the catchment, covering approximately 89ha. These are Lambert’s Castle SSSI, Morecombelake SSSI, Wootton Fitzpaine SSSI and West Dorset Coast SSSI. The West Dorset Coast SSSI is part of the wider Sidmouth to West Bay Special Area of Conservation (SAC). There are 63 Sites of Nature Conservation Interest covering approximately 349ha.



Map of the River Char and Monkton Wyld Stream catchment environmental designations

Key

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

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2 : Issues & Impacts

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**. Both the Char and Monkton Wyld Stream are categorised as **Moderate**. The aim is to have waterbodies classed as **Good**, as a result, they are both considered to be failing watercourses.

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		River Char Condition assessment category	Monkton Wyld Stream Condition assessment category
Overall		Moderate	Moderate
Ecological	Biological	Moderate	Moderate
	Hydromorphological	Supports Good	Supports Good
	Physico-chemical	Moderate	Moderate
	Specific pollutants	No data	No data
Chemical	Priority substances	Good	Good
	Other pollutants	Does not require assessment	Does not require assessment
	Priority hazardous substances	Bad	Bad

The specific elements that are currently failing are:

River Char	Monkton Wyld Stream
Fish	Macrophytes and Phytobenthos
Phosphate	Phosphate
Polybrominated diphenyl ethers (PBDE)	Polybrominated diphenyl ethers (PBDE)
Mercury and its compounds	Mercury and its compounds

Threats:

The Environment Agency have identified the following threats to the River Char and Monkton Wyld Stream. These threats lead to the impacts on the natural environment:

¹ <https://environment.data.gov.uk/catchment-planning/WaterBody/GB108044009790>



- Poor soil & nutrient management in the agricultural sector leading to diffuse sediment & phosphate pollution
- Inadequate agricultural infrastructure leading to point source phosphate pollution that impacts fish populations.
- Private sewage treatment works leading to point source phosphate pollution.
- Phosphate pollution from sources unknown, but includes natural mineralisation, impacting in-stream plant populations.
- More information is needed to understand the sources of PBDE and Mercury.

Impacts:

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. This is specific to the River Char. On the Monkton Would Stream there is reduced in-stream plant diversity and abundance. For both systems, phosphate contamination will lead to increased algal growth which, when it breaks down, will limit oxygen availability in the river for other forms of plants and animals. Little is currently known about the impacts of the hazardous substances on wildlife, and this is an area of further work for the Environment Agency.

Impacts on human health are clearer: A survey by the Environment Agency in 2018/19 measured levels of *E. coli* and Intestinal Enterococci downstream at the pool of the River Char (just before the beach at Charmouth). 20 measurements were made over the course of the year from September 2018 to September 2019. Over these 20 measurements, *E. coli* levels averaged 3,135. The acceptable upper limit is 900. Intestinal Enterococci levels averaged 2,750. The acceptable upper limit is 330.

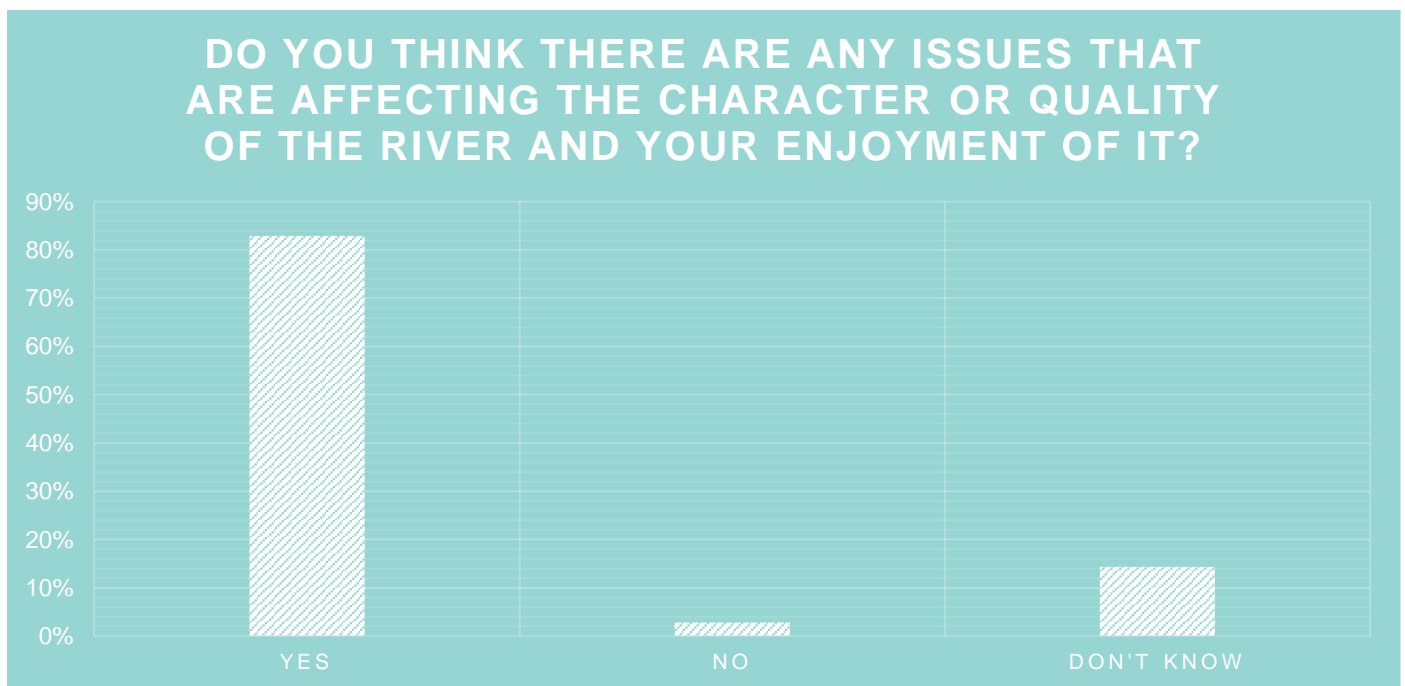


Local assessment

To get a local perspective on the condition and threats faced by the River Char, we carried out an online consultation with the community over Spring 2021. We received 33 responses. Of these, 83% felt there were issues affecting the character and quality of the river. The main causes of concern were felt to be:

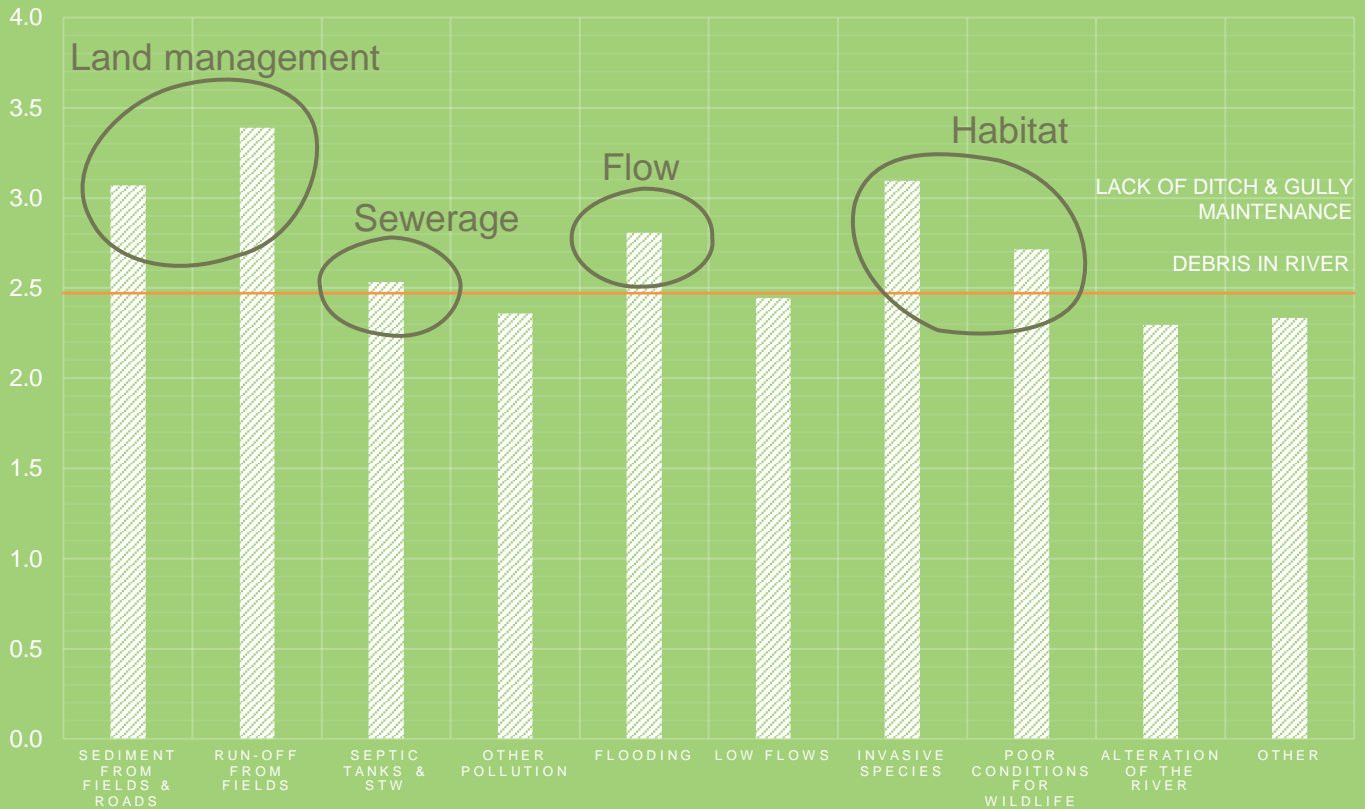
- Sediment from fields and roads
- Runoff from fields
- Discharge from septic tanks and sewage treatment works
- Flooding
- Poor condition for wildlife
- Invasive plant species
- Other issues were also identified, particularly gully and ditch management along with debris in the river

The responses are illustrated in the charts below.





WHAT DO YOU THINK ARE THE MAIN ISSUES IMPACTING THE RIVER WEIGHTED AVERAGE FROM ALL RESPONDENTS



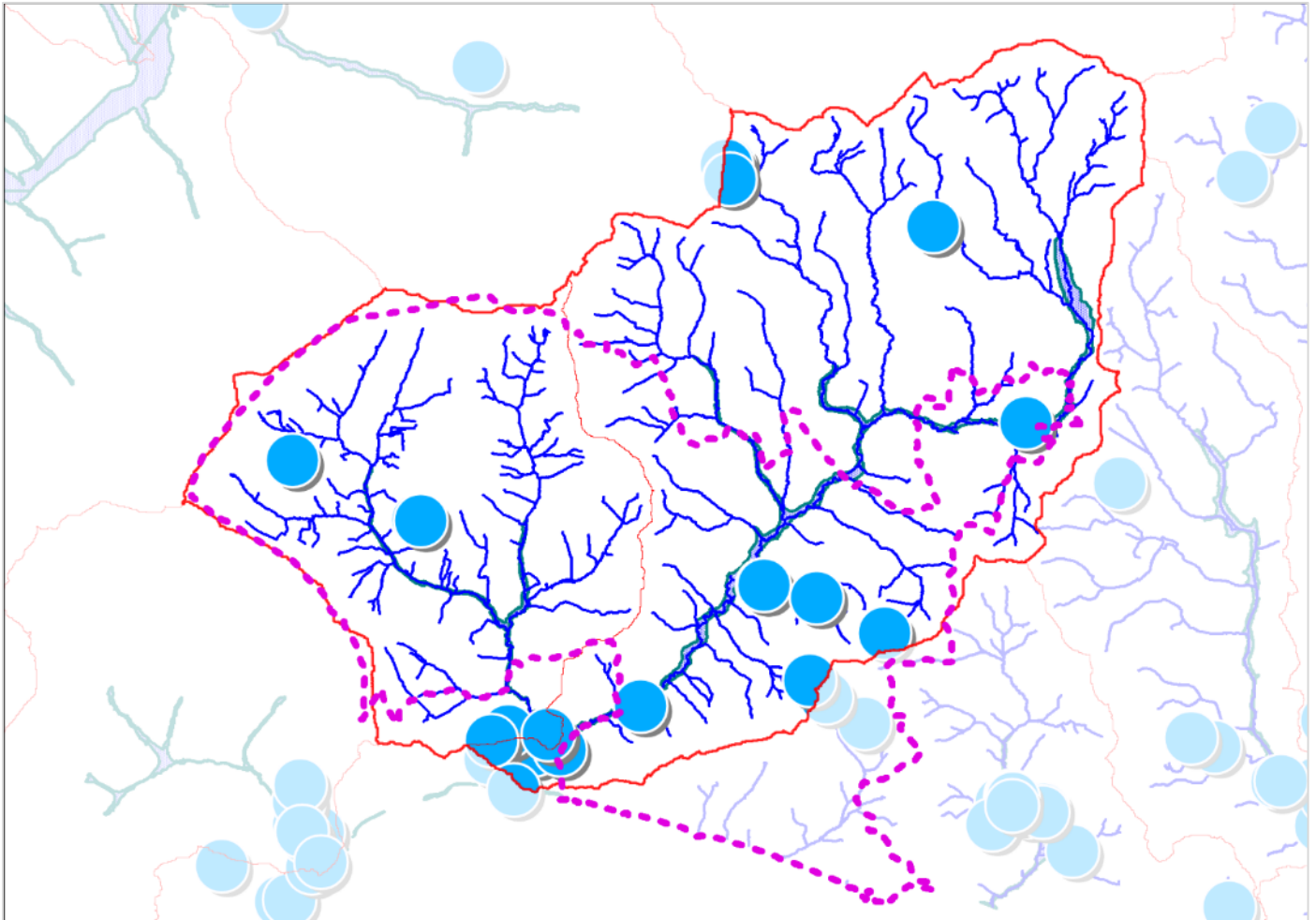
As well as a general community consultation, we also spent time finding out the thoughts of 11 farmers in the area. These aligned with the wider community consultation: agriculture is contributing to the moderate condition of the River Char and Monkton Wyld Stream. Examples given included slurry and dirty water being spread on wet land, erosion of maize ground as well as historic high use of nitrogen. As well as agriculture, it was recognised that poor management of septic tanks was an issue, along with increased rural traffic and invasive species. There was thought to be an increase in the incidence of flash flooding, particularly on roads, and erosion of the channel as a result of flash flooding (a natural function of this type of stream). In terms of future farming in the area, the change from Common Agriculture Policy support to the incoming Environment Land Management support presents a short-term challenge, and looking further forward, so does the changing climate.

We have also consulted other stakeholders about their views on the threats facing the River Char and Monkton Wyld Stream, 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 land management, sewerage, flooding and invasive species all issues recognised by stakeholders. There was also concern raised about alteration of the river leading to increased erosion. Concern was also raised about woody debris in the river.








Historical Environment Agency reports on the River Char going back to 2000 recognise pollution from agriculture, runoff from roads, bank erosion, invasive species, disease of Alder trees and poor conditions for wildlife as issues.

The concerns about land management, sewerage and habitat are borne out by the Water Framework Assessment of the Environment Agency. Flood records, on the other hand, are maintained by Dorset Council's Flood Management Team. There are 29 records of flooding in the Char and Monkton Wyld Stream catchment, shown on the map below.



Map of the River Char and Monkton Wyld Stream catchment records of property flooding

Key

-  River
-  Catchment boundary
-  Group Parish boundary
-  Sites of property flooding
-  Floodplain extent

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

1. Sediment and phosphate contamination from agriculture
2. Phosphate pollution from septic tanks
3. Flash flooding
4. Poor habitat for wildlife
5. The impact of invasive species, particularly Himalayan balsam
6. The desire for the river to function as naturally as possible, but without causing issues downstream

These issues can be summarised into five categories, which are explored in the following sections

1. Land management
2. Sewerage
3. Flow
4. Habitat
5. Morphology



Areas for investigation: land management

Land plays a key role in regulating water quality as water moves through the landscape. By mapping a series of indicators that determine water quality risk, we have identified areas for potential action that could improve water quality.

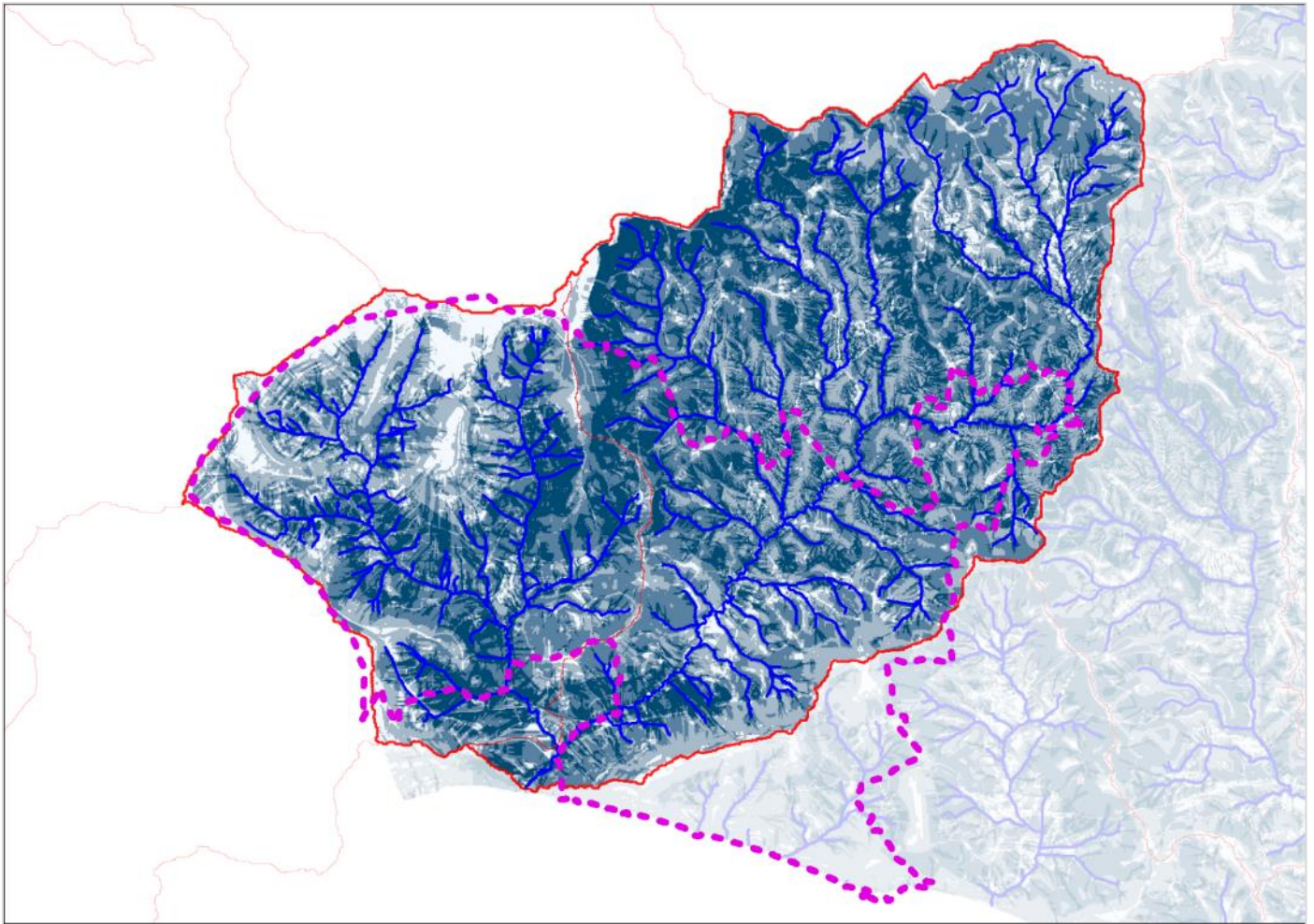
The indicators we have mapped are:

- **Land use risk:** some land uses pose a high inherent risk of diffuse pollution. For example, arable land typically poses more risk to water quality than more natural habitats.
- **Slope:** Slope is a risk factor that poses a threat to water quality, with steeper slopes representing a higher risk.
- **Soil type:** Some soils are particularly prone to erosion, while others represent a risk due to rapid leaching of pollutants in solution.
- **Hydrological connectivity:** In some locations water is more likely to run over the land surface and pick up sediment, due to the shape of the land. These pathways have potential for contaminated water to enter the river.
- **Proximity to watercourse:** Areas in the 'riparian corridor' (near the riverbank) are more likely to be connected to the watercourse, and therefore pose a higher risk.

The map on Page 26 shows where these areas of risk occur and coincide with darker shades showing areas of land where there is a greater risk of water quality being degraded in the catchment. These represent priority areas for investigation and action.






In terms of action, nothing can be done about slope, hydrological connectivity, soil type or proximity to watercourse. However, there are opportunities through changing land use. This can vary from establishment of grass buffers that intercept pollution-laden overland flow in high-risk areas through to land use change away from risky cropping regimes. The most significant would be reversion to grassland, wetland or woodland from maize. However, it does not have to be as fundamental as this, and in fact under-sowing of maize with a crop that reduces the risk of soil erosion would have almost as much impact, or a change in grassland production away from a rye grass dominated sward to one that included more deep-rooting herbal species. The details of what is suitable from both a water quality and farm business perspective would be assessed on a site-by-site basis.

When planning land use change, it is also important to consider where multiple benefits could be delivered, and further mapping can inform action that would also benefit carbon sequestration, enhanced biodiversity and improved access.



Map of the River Char and Monkton Wyld Stream water quality opportunity maps

Key

-  River
-  Catchment boundary
-  Group Parish boundary
-  Lower risk of factors leading to poor water quality
-  Higher risk of factors leading to poor water quality

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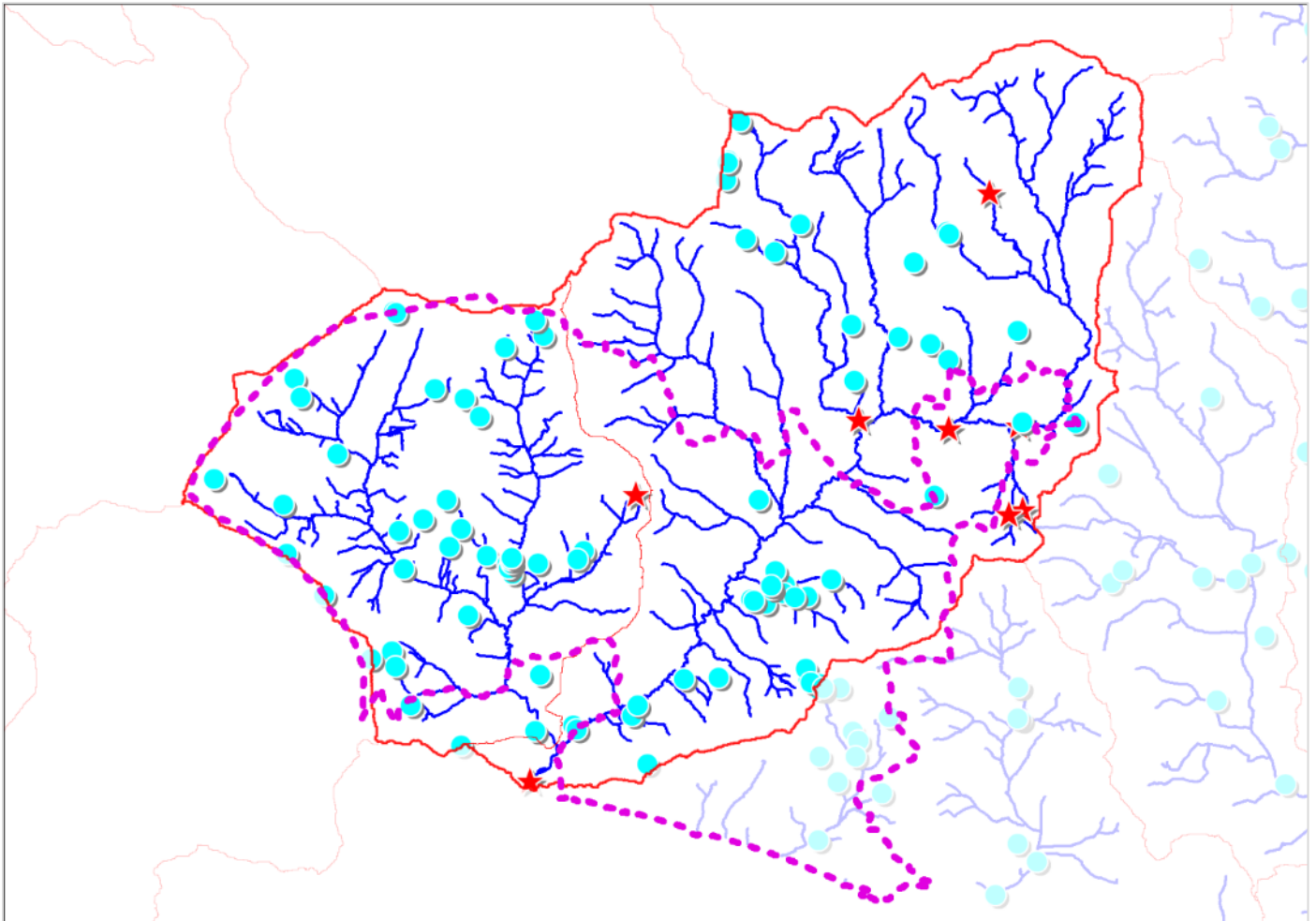


Areas for investigation: sewerage

There are a significant number of consented discharges within the catchment; 89 in total as shown in the map on Page 28. Of these, all but nine are from residential properties for sewerage. Of the nine, four are related to non-residential businesses and five linked to Wessex Water.






Focussing on domestic discharges, the problem for the functioning of the river is not the number of consented discharges, but that some of them may not be operating correctly. Regular maintenance is required to ensure that the effluent leaving the system is as clean as it possibly can be. Raising awareness of the issue and best-practice management are the best course of action here.

In addition to the consented discharges, there have also been eight significant (Category 1 & 2) pollution incidents since 2001. These are shown on the map on Page 28. In addition, there have been 44 Category 3 incidents (a lower pollution risk), the majority of which are of an agricultural origin, and 22 Category 4 incidents (which have no environmental impact).



Map of the River Char and Monkton Wyld Stream consented discharges and class 1 & 2 pollution incidents

Key

-  River
-  Catchment boundary
-  Group Parish boundary
-  Consented discharge locations
-  Class 1 & 2 pollution incident location

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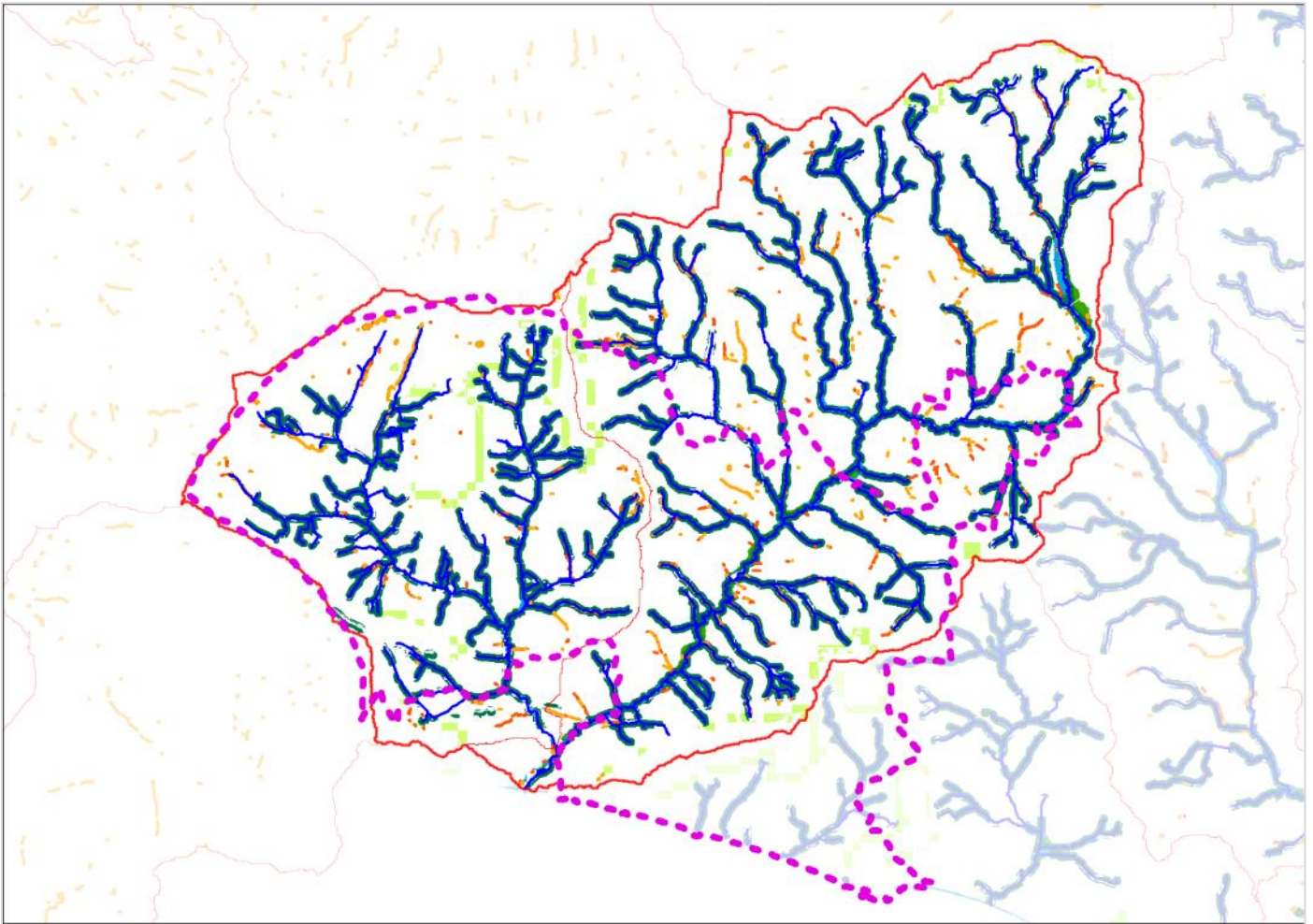
Area for investigation: flow

Though rivers and streams provide many benefits, they can also cause harm, particularly through flooding. This can be from the river itself, groundwater (which isn't an issue in the Char and Monkton Wyld catchments) and from overland flow. There are 29 reported incidents of property flooding in the catchment plus more of farmland flooding.

Slowing the flow of water through the catchment by, for example, holding it back in wetlands or improving infiltration into the soil through woodland planting, can reduce the incidence of flooding. The Environment Agency have undertaken mapping of where the best opportunities are for working with natural processes to reduce flooding. The solutions include planting of trees in the riparian corridor (next to the river), in the floodplain or in the wider landscape. They also include reconnecting the river to its floodplain, where appropriate, so that they function naturally, holding flood water and releasing it more slowly downstream, and therefore avoiding the damaging flood peaks. Another solution to this is creating natural flood water storage areas in priority areas. This is less extensive than floodplain reconnection, but still valuable.










The map on Page 30 shows where opportunities have been identified in the River Char and Monkton Wyld catchments.

Like the biodiversity opportunity mapping, these maps are only a guide and a prompt for discussions with landowners and farmers. Focus should be on sub-catchments where there has been historic flooding, as shown on page 23.



Map of the River Char and Monkton Wyld Stream working with natural processes (flood reduction) opportunity maps

Key

-  River
-  Catchment boundary
-  Group Parish boundary
-  Riparian tree planting
-  Floodplain tree planting
-  Wider landscape tree planting
-  Floodplain reconnection
-  Natural flood storage areas (for smaller flood events)
-  Natural flood storage areas (for larger flood events)

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Area for investigation: habitat

Rivers and streams are vital for healthy and functioning landscapes because they act as corridors for species to move along, connecting important isolated fragments of habitat together and allowing wildlife to thrive. By better managing existing habitats and restoring lost habitats, we can make a positive contribution to the health of the River Char and Monkton Wyld Stream along with the wider landscape.

Mapping undertaken by the Dorset AONB has identified important core habitats for grassland and woodland (see pages 16-17). The mapping also identifies appropriate sites for restoration, particularly where there is already suitable land cover and the sites are close to existing important habitats. Restoration of these high-priority sites, in addition to better managed land surrounding existing high-quality habitats, will lead to a healthier natural environment that is better able to withstand the stresses of climate change.

The maps on Pages 32 and 33 show the high-priority sites for restoration and 250m buffer around existing core habitats as well as a 100m buffer around the river. These buffers are based on the Natural England recommendation that land should be better managed around core habitats, and a buffer of between 100m and 500m is advisable.

Grassland restoration opportunities are focussed in the headwaters of the stream, apart from along the streams flowing from Dodpen Hill and Wyld Warren in the west of the Monkton Wyld catchment, where opportunities are present along the river. Enhanced management for grassland wildlife surrounding the core habitats and rivers focusses where efforts should be made.

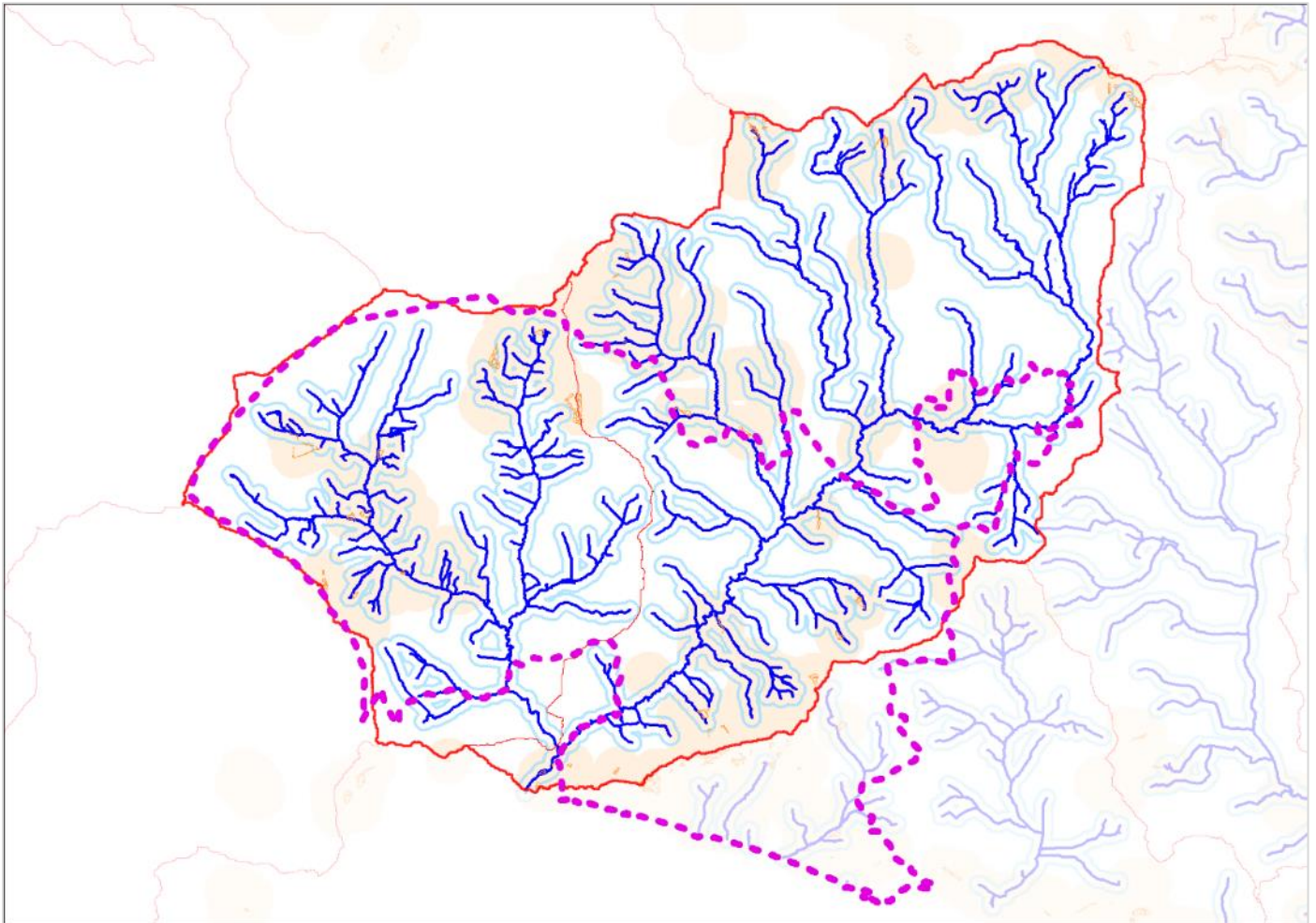
Woodland opportunities, like the grassland opportunities, are focussed in the headwaters, apart from the Dodpen Hill / Wyld Warren tributary where there are opportunities down the river as well. Due to the wooded nature of the area, better management for woodland wildlife would be beneficial almost anywhere.

It is important to note that these maps only make suggestions, and details need to be explored further on a site by site basis. They also do not take into account the quality of existing habitat, so surveys are required to make sure that woodland planting, for example, is not being proposed on high quality grasslands. The intended use of the maps is to help inform conversations with interested landowners and not as a vision for what the area should look like.

In terms of action, we can use these maps to help us plan where to start conversations with farmers and foresters. Priority habitats for restoration and enhancement would be wet woodland and wet grassland, as this will have maximum impact for the river environments as well as for climate sequestration (capturing and locking away excess carbon dioxide in the atmosphere) and reducing downstream flooding. We can support farmers to access grants to make changes, where they fit with their farming system. Examples of funding that is available are Countryside Stewardship or the newly released Farming in protected Landscapes grant or Nature for Climate Fund.







As well as restoring habitats, we also need to ensure good management of the existing core habitats and where possible, sympathetic management in the buffer areas. This could be habitat restoration, but could also be, amongst other things, managing grassland with fewer inputs, introducing herbal leys, or letting hedgerows grow out. It also includes managing invasive species, the most prominent of which is Himalayan balsam.

By delivering for biodiversity, we would also be helping to meet the UK government's ambition of protecting 30% of England, Wales, Scotland and Northern Ireland by 2030.

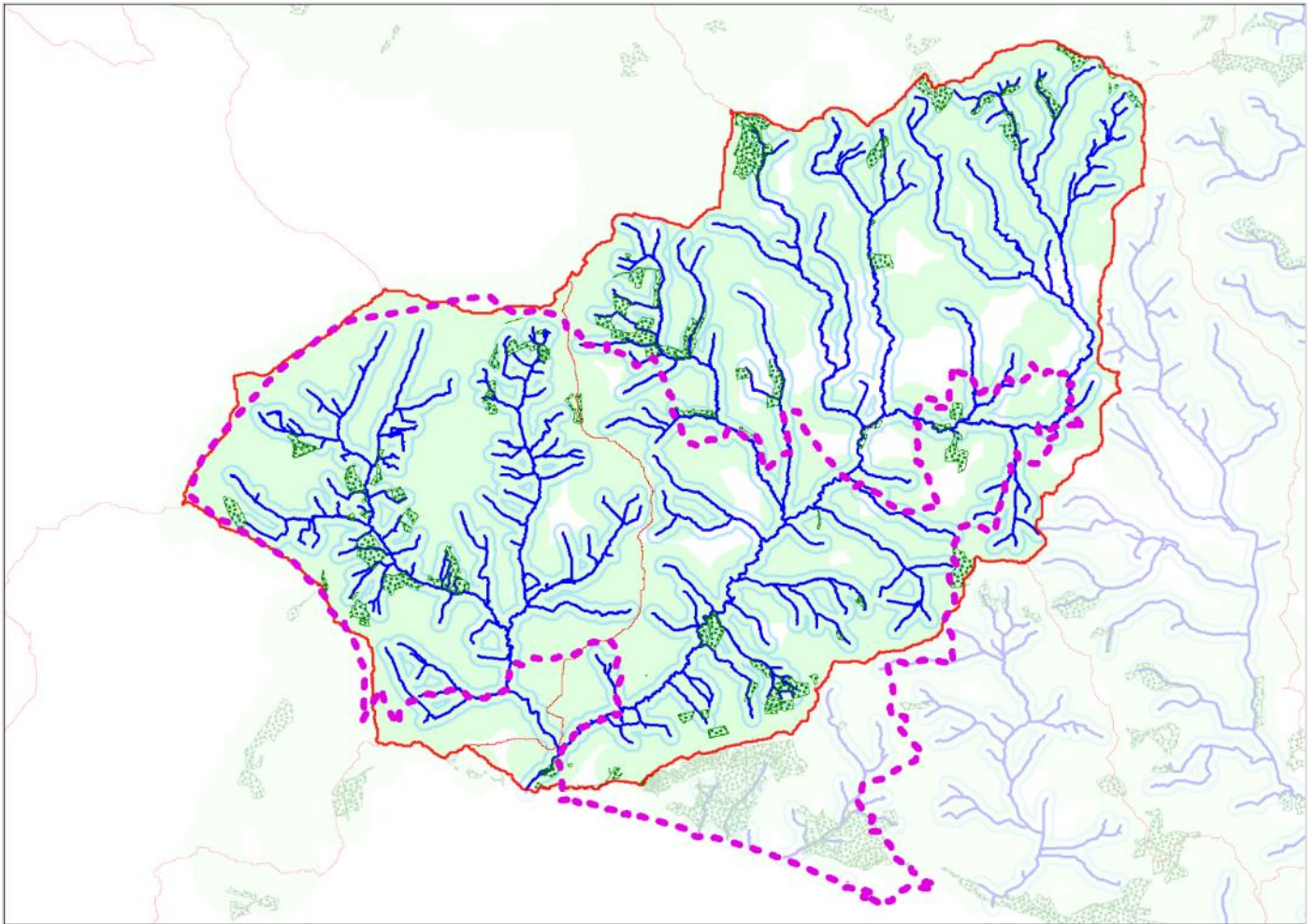


Map of the grassland restoration and enhanced management opportunities for the River Char and Monkton Wyld Stream

Key







-  River
-  Catchment boundary
-  Group Parish boundary
-  High priority grassland restoration areas
-  Grassland better management buffer (250m)
-  River better management buffer (100m)

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Map of the woodland restoration and enhanced management opportunities for the River Char and Monkton Wyld Stream

Key

-  River
-  Catchment boundary
-  Group Parish boundary
-  High priority woodland restoration areas
-  Woodland better management buffer (250m)
-  River better management buffer (100m)

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Area for investigation: morphology

What follows is a description of the River Char and Monkton Wyld Stream by Environment Agency Geomorphologists:

By Dorset standards the River Char and Monkton Wyld Stream are reasonably active 'gravel bed rivers' and are far more geomorphologically dynamic than a typical low energy, low sediment supply chalk river such as the River Piddle, River Cerne or Sydling Water.

The River Char and Monkton Wyld Stream generate a good supply of coarse sediment from hill slope processes in the headwaters along with channel movement further down the system that exposes ice-age gravel deposits within the floodplain. This exposure of gravel and movement across the floodplain is in part a function of the relatively 'flashy' response of the catchment to rainfall, with a large range in flows over a short space of time resulting from rapid surface runoff generated from the relatively steep and impermeable soils and geology.

The relatively plentiful supply of gravels combined with the flow and energy in the steep channel network moves this gravel downstream and in doing so creates in-channel bed forms such as point and mid-channel bars along much of the mid and upper reaches in particular. These in turn trigger changes in flow direction that trigger new bank erosion, liberating more sediment and triggering further channel change.

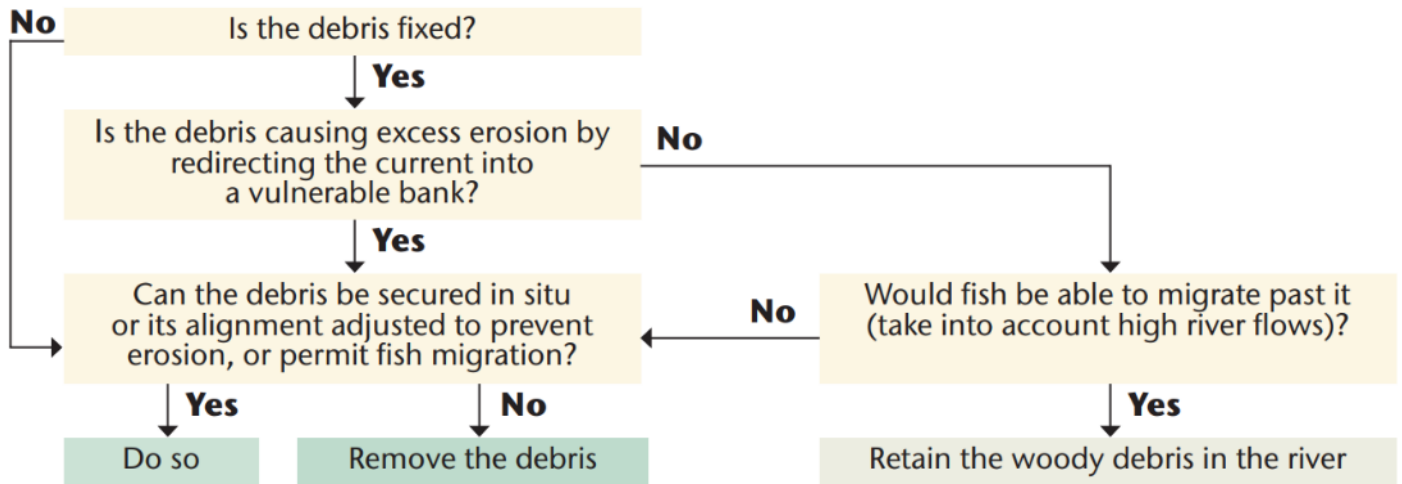
Of course, the relatively steep and impermeable catchment is also associated with the delivery of fine sediment to the channel. It's likely that the land use and land management is combining with the physical properties of the catchment to result in elevated high levels of fine sediment that will be stored within the gravel bed and may be detrimental to the function of the bed for fish and invertebrates. However, in contrast to low energy fine sediment laden chalk rivers such as the Piddle, there is a greater potential for flushing of fines stored in the bed when the frequent high flow events rework the gravels in the upper bed.

A pristine river of this type would display a range of forms as you move from the steep headwaters, with narrow or no floodplain, to the lower gradient lower reaches where a more extensive floodplain would be expected. The relatively high energy and available sediment would combine with the other key agent of change: large woody debris. In the mid-upper reaches, the presence of large woody debris would result in some channel splitting as gravels build up behind the blockages and this in turn would trigger channel abandonment under high flows, i.e. a more complex channel planform, probably with a dominant channel but less incised and disconnected from the floodplain than the current single thread form. Further down the system where gradients slacken, you would expect the deposition of gravels delivered from the steeper upper catchment to be associated with an active meandering channel form across a wooded/wetland floodplain, probably involving more than one channel as temporary obstructions under high flows trigger channel abandonment and the formation of new channels inundated under higher flows to start with, but with the potential to become the dominant channel in time.

As can be seen from the description above, large woody debris within the channel is a key driver of natural function. However, in a landscape where the river is constrained by historic and current use, this may not always be an appropriate aim. Recently developed mapping techniques can look at where restoration to a naturally functioning system would be possible at a large scale, for example on a tributary of the River Char. On a local scale, individual decisions should be made about the suitability of retaining large woody debris in the river. The Wild Trout Trust have developed a simple decision matrix to help inform decisions



about large woody debris retention. This is set out below (© Wild Trout Trust) and more information can be found on their website².



² https://www.wildtrout.org/assets/files/library/Woody_Debris_Apr2012_WEB.pdf



3 : Action

We received a range of responses from the community about how we should go about tackling these issues and impacts. The most common were:

- Community engagement
- Work with farmers
- Research, survey, monitor



Word cloud showing the range of responses received during the community consultation for how we could tackle the issues facing the River Char and Monkton Wyld Stream

This chimes with our experiences on the River Asker. Based on these thoughts of the community and our experience, the following actions are a good starting point:

For delivery by the community

1. Monitoring

Interested community members could be trained in simple river monitoring techniques, from looking at the insect life that lives in the stream through the chemical properties of the water. Undertaking regular monitoring would give the community early warning of pollution incidents and an opportunity to inform the relevant authorities. It would also allow the community to monitor the effectiveness of any restoration undertaken. It would also create a sense of ownership and pride in this important habitat. Greater frequency of monitoring would also allow us to improve on the statutory agencies' basic monitoring regime



For delivery by professionals, with support from the community

2. Habitat improvement & restoration

This would restore the natural processes of the river where it has been altered. This would allow aquatic plants and fish species to thrive. A lot can be achieved relatively simply and in conjunction with groups of volunteers. Looking beyond the river itself, reconnecting the river to the floodplain and restoring wet woodland and wet grassland would help the river both to function naturally and to better connect isolated habitats throughout the catchment.

3. Invasive species control

Himalayan balsam: this would allow native bank flora to thrive and reduce the potential for bank erosion, which is a source of sediment. Again, this is relatively easily achieved and can use volunteers. The infestation on the River Char is large, and it is unlikely that full control will ever be achieved, but with a strategic approach, working from the headwaters downstream, a difference could be made. *Mink*: monitoring of riparian mammals using mink rafts would allow us to improve our understanding of the species that are using the rivers. Mink control, if found to be present, would reduce pressures facing the native water vole, which is fast-declining nationally.

4. Research & survey

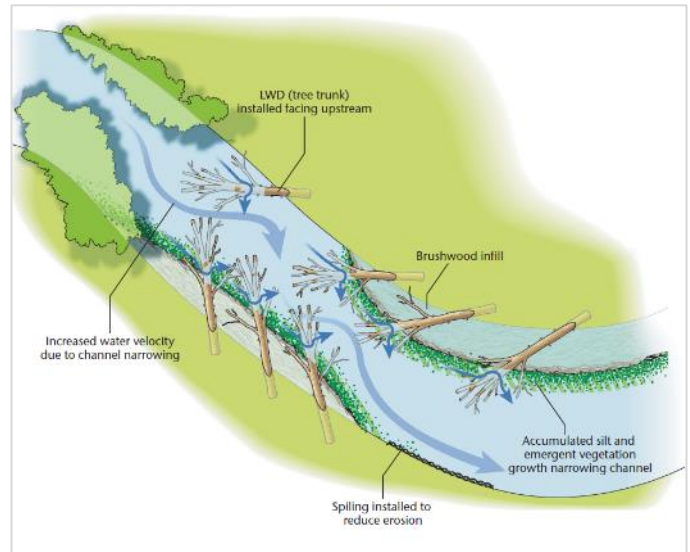
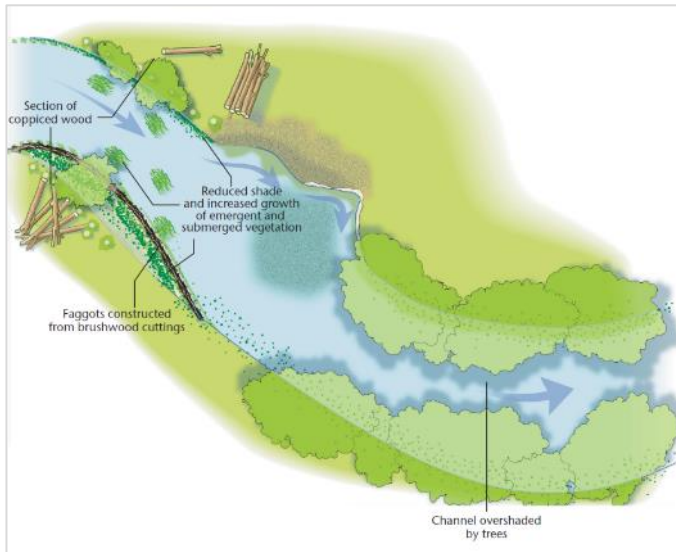
Further research, with the help of interested community members, could help refine what condition we should be aiming for with the River Char and Monkton Wyld Stream. Particular areas of interest are:

- What the natural state of the river would be (a geomorphological appraisal of the river)
- What animals and plants would we expect to find here compared with what we do find (an ecological appraisal of the river).

Further work could also be undertaken to identify hotspots for invasive species, habitat loss and erosion, and where there are opportunities for re-wilding rivers.

5. Community engagement

As well as practical hands-on opportunities to improve the state of the river, walks, talks, demonstrations and other awareness raising activities could take place to highlight the success of any projects, and highlight what could be done about some of the issues, for example better septic tank management.



Illustrations of habitat improvement techniques © Wild Trout Trust

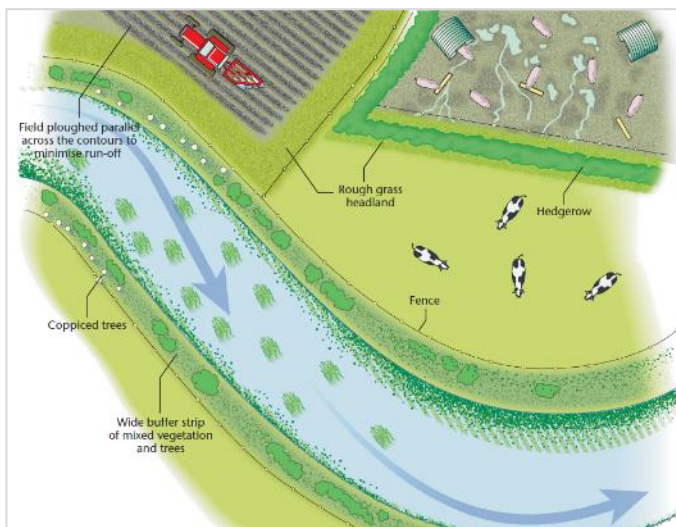
For delivery by professionals in conjunction with land managers

6. Agricultural land management change

By working with the farming community in the catchment to make changes to the way the land is managed, we could reduce sediment runoff and therefore nutrient pollution. It could also improve rainwater infiltration and therefore delay and reduce flood peaks.

7. Natural Flood Management

At strategic locations throughout the catchment, interventions such as small leaky woody dams, gully blocking, and tree and hedge planting could be installed to slow the flow of water over the land and increase storage of water within the soils. By doing this we could delay and potentially reduce flood peaks and reduce sediment runoff. The nature of the works involved would allow volunteers to help with delivery.



Examples of opportunities for improving land management © Wild Trout Trust

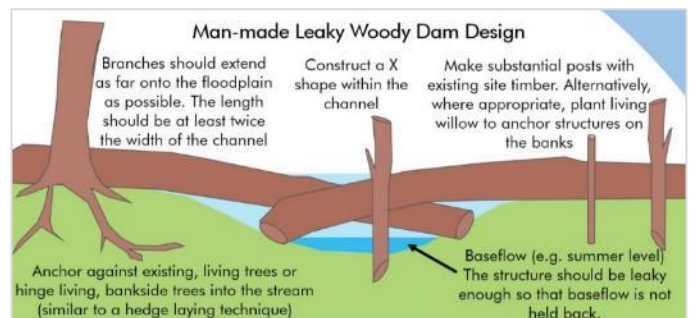


Illustration of a leaky woody dam © FWAG SW



Other opportunities

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

- Wessex Water are developing Drainage and Waste Water Management Plans³ 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 & Sea⁴ 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 Charmouth 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 Plan⁵. Of particular interest / relevance are:
 - Farming in Protected Landscapes. Funding from Dorset AONB for farmers to deliver projects that enhance wildlife, adapt to climate change, encourage people to access the landscape and conserve and enhance this special place⁶.
 - Woodland Creation Grants from the Forestry Commission. There are high priority areas for woodland planting in the headwater of the River Char that address water quality⁷.
 - The evolution of Catchment Sensitive Farming alongside the beginning of Environment Land Management Systems⁸.

These actions have been set out into an action plan, below.

³ <https://wessexwater.maps.arcgis.com/apps/MapSeries/index.html?appid=e371301c24ca4228b36db3a3a6ba8560>

⁴ <https://www.litterfreecoastandsea.co.uk/current-projects-and-campaigns/beach-profiles/>

⁵ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/954283/agricultural-transition-plan.pdf

⁶ <https://www.dorsetaonb.org.uk/resource/farming-in-protected-landscapes/>

⁷ <https://www.forestergis.com/Apps/MapBrowser/>

⁸ <https://www.gov.uk/guidance/catchment-sensitive-farming-reduce-agricultural-water-pollution>



Action Plan

Topic	What	Who	How	Scale	When	How much
Monitoring (CE, RSM)	River fly monitoring	Dorset Wildlife Trust & CVPC / interested community members	Undertaking Riverfly training and adopting sections to monitor	Entire catchment	Summer	£
	Westcountry Rivers Trust citizen science	Westcountry Rivers Trust, CVPC & interested community members	In tandem with Riverfly training and delivery	Entire catchment	Summer	£
Habitat improvement & restoration (CE, WF)	Riparian tree management	Dorset Wildlife Trust, CVPC & interested community members	Dorset Wildlife Trust liaise with landowners, plan and deliver regular sessions	Specific reaches	Winter	££
	Instream habitat restoration	Dorset Wildlife Trust, CVPC & interested community members	Dorset Wildlife Trust liaise with landowners, seek permissions, plan and deliver regular sessions	Specific reaches	Winter	££
	Restore riparian habitats	Dorset Wildlife Trust	Dorset Wildlife Trust liaise with landowners, plan and deliver habitat restoration	Specific reaches	Ongoing	£££



Invasive species control (CE, WF)	Pull Himalayan balsam	Dorset Wildlife Trust, CVPC, contractors & interested community members	Dorset Wildlife trust plan and deliver a strategic programme of Himalayan balsam control	Ideally entire catchment, broken into tributaries	Summer	£££
	Walkover survey	Dorset Wildlife Trust	Dorset Wildlife Trust or specialist contractors plan and deliver walkover surveys of the river to identify issues with rural runoff, habitat degradation and invasive species.	Ideally entire catchment, broken into specific reaches	Winter	£££
Research & survey (RSM)	Geomorphological assessment	Dorset AONB & CVPC to engage a specialist contractor	Plan and deliver a geomorphological assessment of the river to better understand where restoration of natural process would be possible	Ideally entire catchment, broken into specific reaches	Anytime	£££
	A series of walks, talks and demonstrations	CVPC & Dorset AONB	Dorset AONB to coordinate a series of events to raise the profile of the River Char and Monkton Wyld Stream	Entire catchment	Ongoing	£
Community engagement (CE)	Awareness raising campaigns	CVPC & Dorset AONB	CVPC to coordinate a publicity	Entire catchment	Ongoing	£



			campaign to highlight best-practice septic tank management alongside ways of reporting pollutions incidents			
Agricultural land management change (WF)	Planning environmental land management	Dorset Wildlife Trust & Farming and Wildlife Advisory Group	Liaise with and support farmers to apply for funding that will facilitate a change to sympathetic management for the River Char and Monkton Wyld Stream	Entire catchment	Ongoing	£££ - catchment-wide liaison ££££ - land use change
Natural Flood Management (WF)	Delivery of natural Flood Management solutions	Dorset Wildlife Trust, CVPC, contractors & interested community members	Liaise with the farming community to plan and deliver Natural Flood Management solutions at high-risk areas	Headwaters	Winter	£££
Other opportunities	Explore other opportunities	Dorset AONB, CVPC & interested community members	Liaise with other stakeholders to explore partnership working in the catchment to deliver multiple benefits	Entire catchment	Ongoing	£



'How Much' key:

- £ = tens of pounds
- ££ = hundreds of pounds
- £££ = thousands of pounds
- ££££ = large complex projects requiring a mix of revenue and capital funds in the region of thousands of pounds

Acronyms:

- CVPC – Char Valley Parish Council
- CE – Community Engagement
- WF – Work with Farmers
- RSM – Research, survey, monitoring



Summary

The River Char, Monkton Wyld Stream and accompanying Marshwood Vale is a renowned pastoral landscape with bountiful hedges and hedgerow trees, and the vale is rimmed with characterful hill forts. The rivers are not formally fished and, it is believed, have never been stocked, resulting in an unusually 'natural' brown trout population of high conservation value.

Medium to large dairy units dominate much of the area with agricultural land use in the catchment being nearly all permanent and temporary grassland. The exception to this is maize cultivation, the extent of which varies from year to year. In the headwaters of the Monkton Wyld Stream there is also extensive coverage of woodland. There are significant patches of SSSI and SNCI grassland.

Both the River Char and Monkton Wyld Stream are classified as **Moderate** by the Environment Agency and are therefore considered failing watercourses in need of improvement. Historical EA reports from 2000 identify pollution from agriculture, from roads, invasive species, disease of Alder trees and poor conditions for wildlife as the main issues. Further concerns about land management, sewerage, habitat and health & safety issues associated with bathing water quality downstream at the mouth of the River Char have been expressed in the EA's Water Framework Directive Assessment, Char Valley Parish Council and voiced by local residents.

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

1. Sediment and phosphate contamination from agriculture
2. Phosphate / sewage pollution from septic tanks
3. Flash flooding
4. Poor habitat for wildlife
5. The impact of invasive species, particularly Himalayan balsam
6. The desire for the river to function as naturally as possible, but without causing issues downstream

There is a will from local people to try and improve the state of their river, and actions have been identified that will allow this to happen from the winter of 2021.

Possible actions to address the problems identified:

1. Monitoring

Interested community members could be trained in simple river monitoring techniques, from looking at the insect life that lives in the stream through the chemical properties of the water. Undertaking regular monitoring would give the community early warning of pollution incidents and an opportunity to inform the relevant authorities. It would also allow the community to monitor the effectiveness of any restoration undertaken. It would also create a sense of ownership and pride in this important habitat. Greater frequency of monitoring would also allow us to strengthen the statutory agencies' basic monitoring regime

2. Habitat improvement & restoration

This would restore the natural processes of the river where it has been altered. This would allow aquatic plants and fish species to thrive. A lot can be achieved relatively simply and in conjunction with groups of volunteers. Looking beyond the river itself, reconnecting the river to the floodplain and restoring wet woodland and wet grassland would help the river both to function naturally and to better connect isolated habitats throughout the catchment.



3. Invasive species control

Himalayan balsam: this would allow native bank flora to thrive and reduce the potential for bank erosion, which is a source of sediment. Again, this is relatively easily achieved and can use volunteers. The infestation on the River Char is large, and it is unlikely that full control will ever be achieved, but with a strategic approach, working from the headwaters downstream, a difference could be made.

Mink: monitoring of riparian mammals using mink rafts, would allow us to improve our understanding of the species that are using the rivers. Mink control, if found to be present, would reduce pressures facing the native water vole, which is fast-declining nationally.

4. Research & survey

Further research, with the help of interested community members, could help refine what condition we should be aiming for with the River Char and Monkton Wyld Stream. Particular areas of interest are:

- What the natural state of the river would be (a geomorphological appraisal of the river)
- What animals and plants would we expect to find here compared with what we do find (an ecological appraisal of the river).

Further work could also be undertaken to identify hotspots for invasive species, habitat loss and erosion, and where there are opportunities for re-wilding rivers.

5. Community engagement

As well as practical hands-on opportunities to improve the state of the river, walks, talks, demonstrations and other awareness raising activities could take place to highlight the success of any projects, and highlight what could be done about some of the issues, for example better septic tank management.

6. Agricultural land management change

By working with the farming community in the catchment to make changes to the way the land is managed, we could reduce sediment runoff and therefore nutrient pollution. It could also improve rainwater infiltration and therefore delay and reduce flood peaks.

7. Natural Flood Management

At strategic locations throughout the catchment, interventions such as small leaky woody dams, gully blocking, and tree and hedge planting could be installed to slow the flow of water over the land and increase storage of water within the soils. By doing this we could delay and potentially reduce flood peaks and reduce sediment runoff. The nature of the works involved would allow volunteers to help with delivery.