State of the River Asker Summary

03/01/2019

Dorset Area of Outstanding Natural Beauty

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CONTENTS

INTRODUCTION

The River Asker rises under Eggardon Hillfort and flows towards the sea at West Bay. It flows over mudstones and sandstones through a predominantly agricultural setting. The length of the main river is approximately 12km with another 12km of tributaries. The catchment area is approximately 18km^2. The entire catchment is in the Dorset Area of Outstanding Natural Beauty.

The Environment Agency, the statutory body responsible for monitoring our rivers, has classed the River Asker as poor because of the lack of fish and aquatic plants. There is no one body responsible for improving the quality of the water course, so the Dorset Area of Outstanding Natural Beauty team, in partnership with the Dorset Wildlife Trust and Farming and Wildlife Advisory Group SouthWest have come together to help the communities along the river identify the problems that need fixing and plan works that overcome them.

Over the course of 2018, the communities along the River Asker will come together, with the support of the Dorset AONB, DWT and FWAG, to improve the quality of the River Asker. It is anticipated that over the course of the year, the project will follow some key stages. These are:

- Community engagement: this will raise awareness of the issues facing the river and keep people up to date about progress.
- Establish working group: this will bring interested people together to learn more about the river and plan action to improve its condition.
- Evidence gathering: experts will gather evidence from walk-over surveys and official records and present them in a main report and summary (this document)
- Identify, prioritise and deliver action: the community will prioritise the actions to improve the condition of the river, and these will be delivered over the course of autumn and winter 2018.

If you would like to find out more about the State of the River Asker, have a look at the main report, a copy is held by the Parish Council.

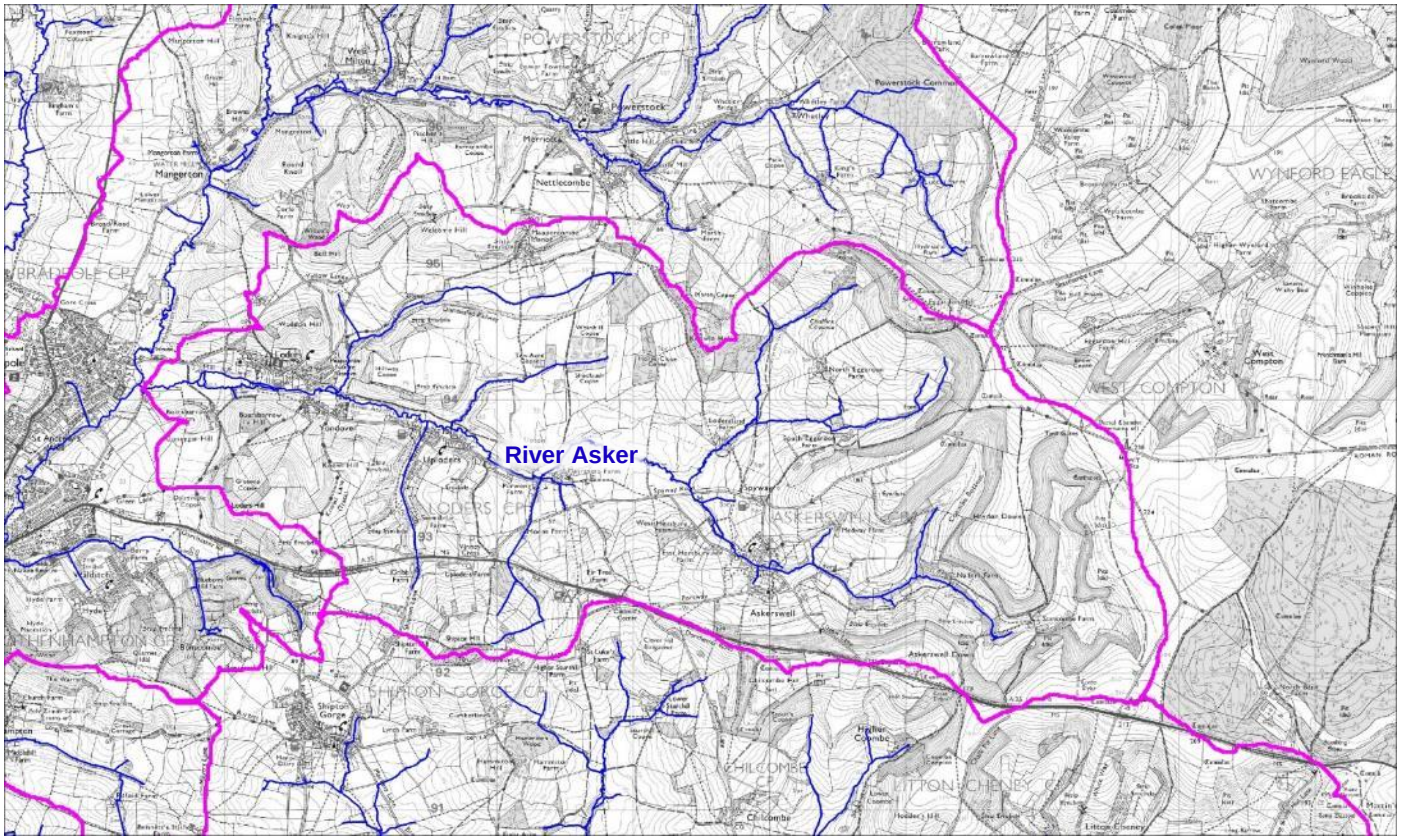


Figure 1: Map of the River Asker

Key

River

Catchment boundary

CATCHMENT DESCRIPTION

Geology

The main rocks found in the Asker catchment are, from its source in the east to the meeting with the Mangerton Brook in the west:

- chalk, which acts like sponge absorbing water, filtering out pollutants before releasing it slowly all year round. This means the river should have clear water.
- Sandstone, which is less porous than the adjacent chalk.
- mudstone, which does not soak up water, so rain will run over the surface, picking up soil and other pollutants before it joins the river or its tributaries. This mean the river will be cloudy when it flows over mudstones.

Soils types

The main soil types are heavily influenced by the underlying geology. These soils, in turn, influence the sort of farming that can take place. The soil types found in the catchment, from west to east, are:

- Shallow lime-rich freely draining soils. This is best suited for herb-rich grassland, beech and other lime-rich woodlands. It is also suited to spring and autumn crops.
- Slowly permeable, seasonally wet, slightly acid but base-rich, loamy and clayey soils. This soil type supports seasonally wet pastures and woodlands. It is suited to grass production for dairy or beef and some cereal production, often for animal feed.
- Lime-rich loamy and clayey soils with impeded drainage. This soil type supports pastures along with marsh vegetation in wetter area. It is also suited to autumn sown crops and grass.
- Freely draining slightly acid loamy soils. This soil type supports pastures and deciduous woodlands. It is suited to a range of spring and autumn sown crops.

Land use

Intensive land use:

- Improved grassland covers 39% of the catchment
- Crops cover 25% of the catchment

Extensive land use:

- Chalk grassland covers 6% of the catchment, mostly in the east.
- Neutral grassland only covers 0.5% of the catchment
- Broadleaved woodland covers 6% of the catchment
- Semi-improved grassland covers 19% of the catchment. Semi-natural grassland is not as rich in plant species as chalk or neutral grassland.

Designations and records

The importance of the extensive land use for wildlife is recognised in several official designations. These are either of national importance or local importance and are listed below:

- Haydon & Askerswell Downs Site of Special Scientific Interest (SSSI) - national
- Approximately half of Eggardon Hill & Luccas Farm SSSI - national
- 6 Site of Nature Conservation Interest (SNCI) - local

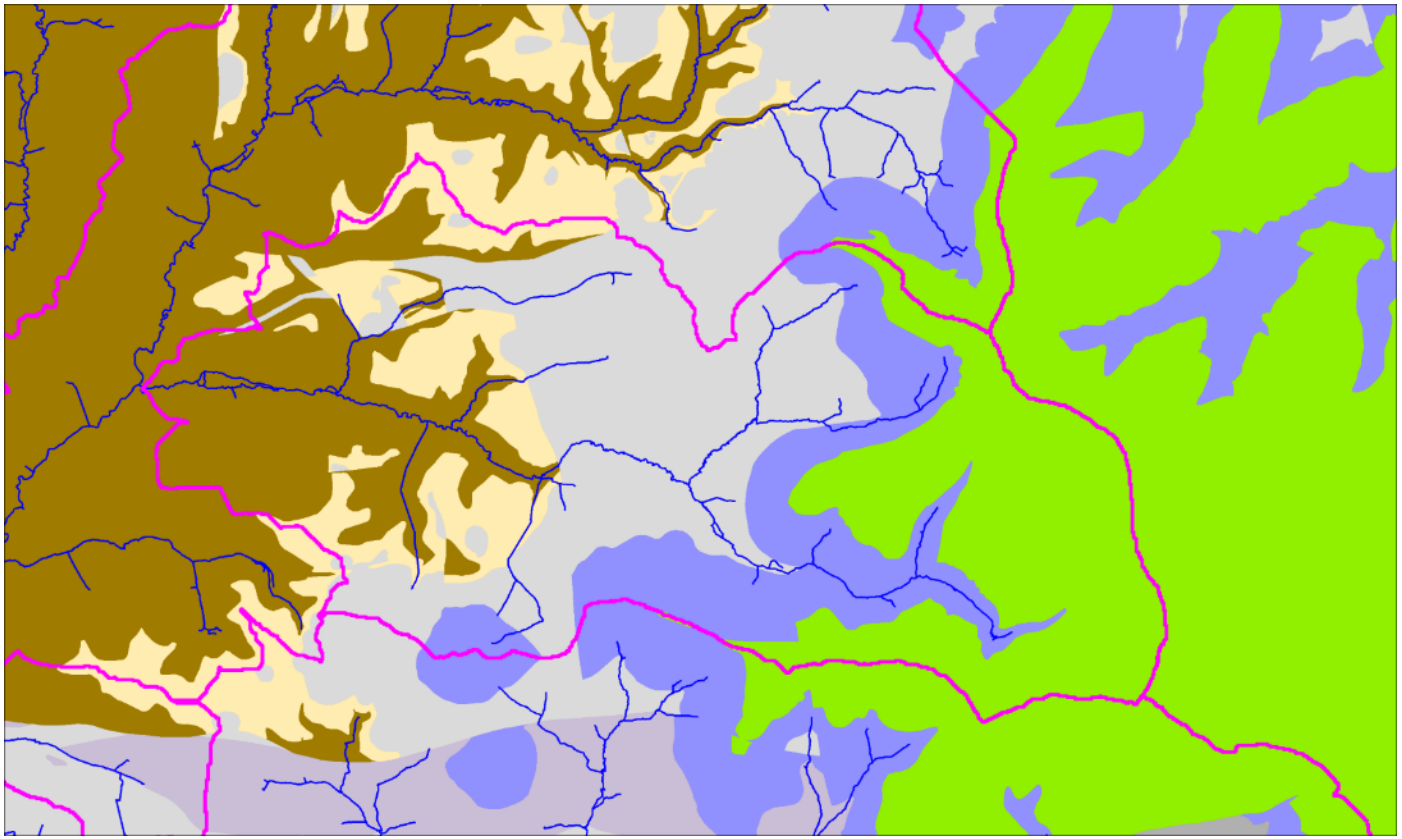


Figure 2: Geology of the River Asker catchment

Key

- River
- Catchment boundary
- Chalk (Holywell Chalk Nodular Formation)
- Sandstone (Upper Greensand Formation)
- Mudstone (Forest Marble Formation)
- Mudstone and limestone interbedded: Inferior Oolite Group
- Mudstone and limestone interbedded: Lias Group

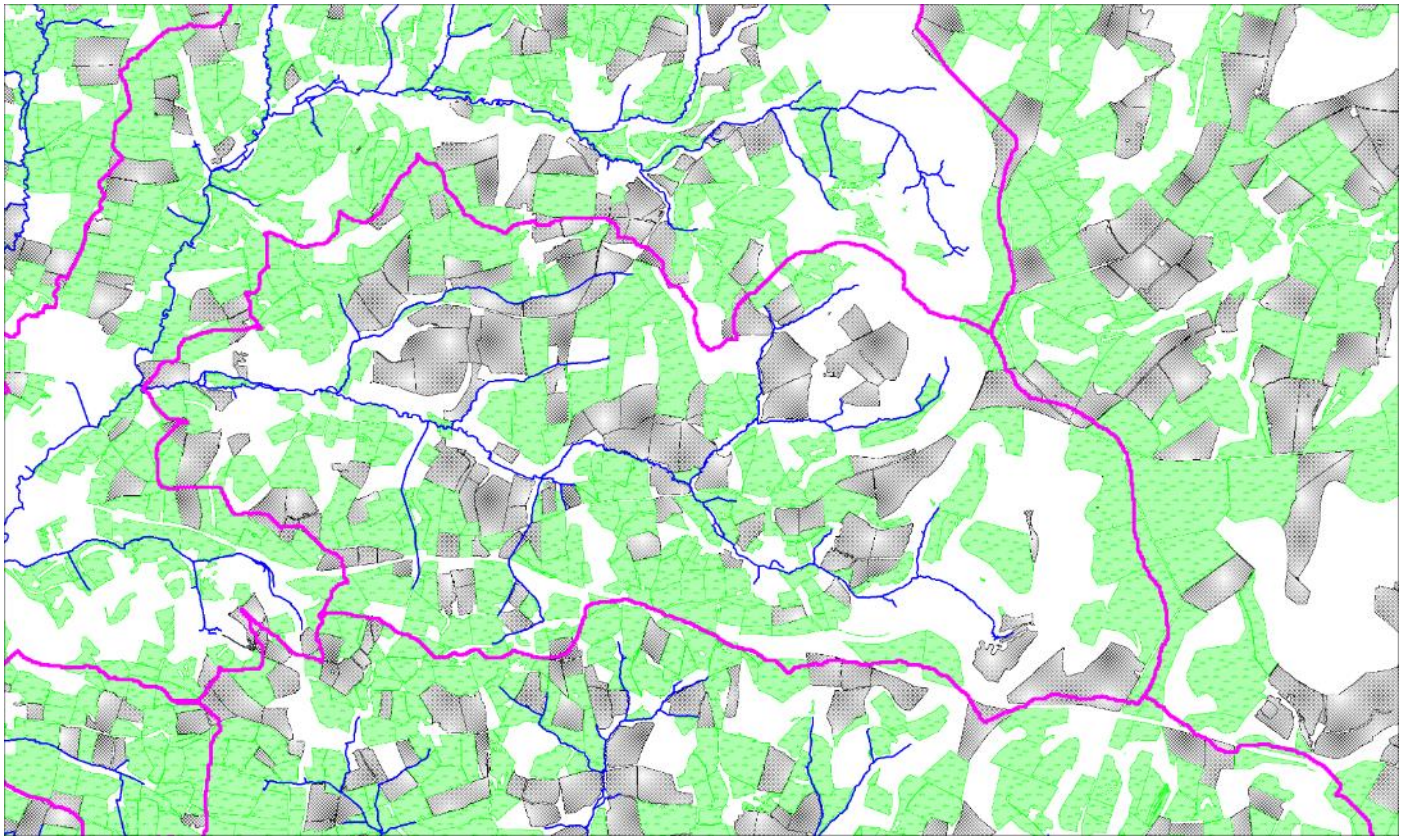


Figure 3: Intensive land use of the River Asker catchment

Key

- River
- Catchment boundary
- Arable
- Improved grass

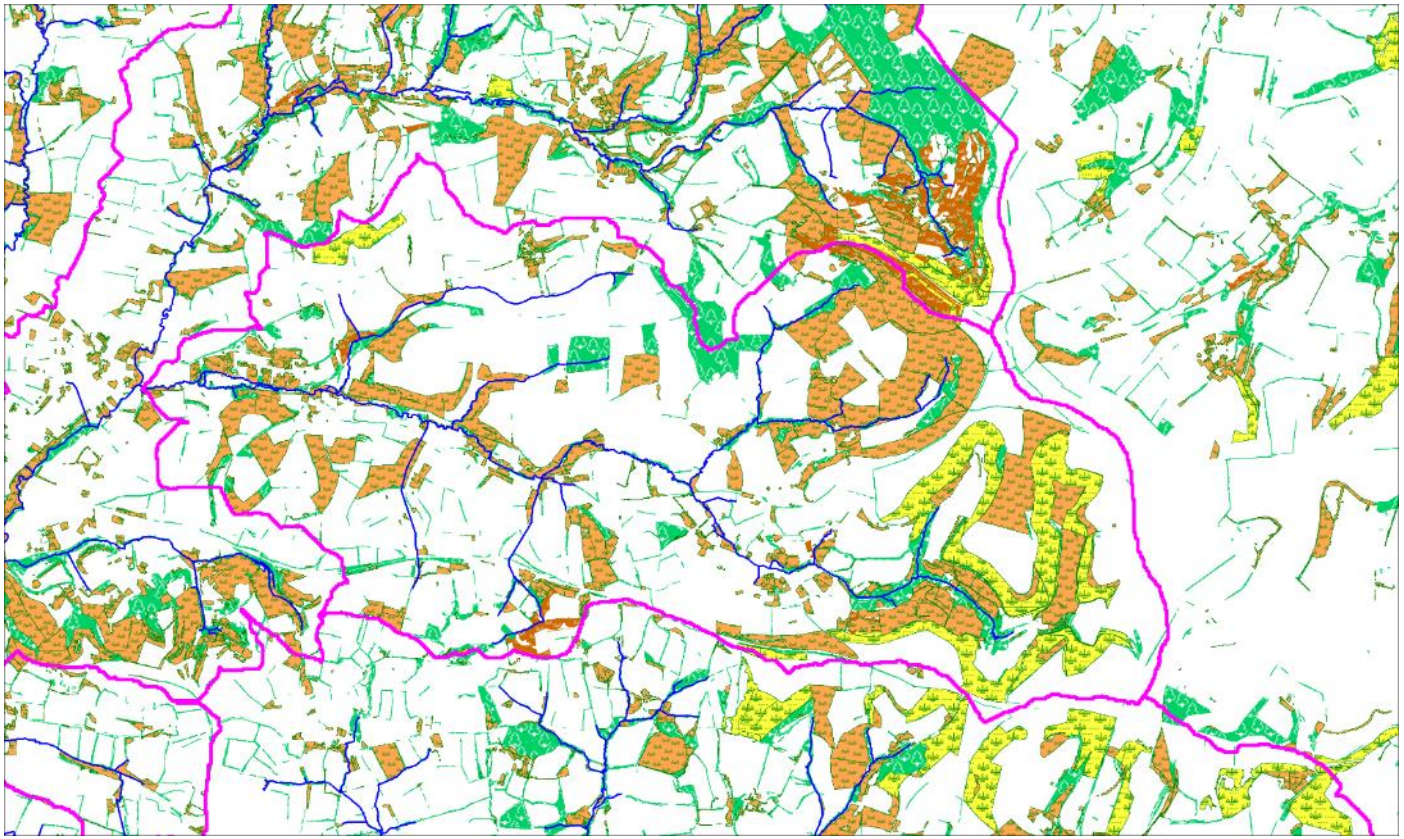


Figure 4: Extensive land use of the River Asker catchment

Key

- River
- Catchment boundary
- Calcareous grass
- Neutral grassland
- Semi-improved grass
- Broadleaved woodland

CATCHMENT PRESSURES

Water quality

Good water quality is vital to a healthy river system. There are many things that could impact this, but the most likely in the River Asker are:

- Nutrients: phosphorus & nitrogen
- Suspended solids: including both sediment & organic material
- Pesticides (and other chemical pollutants from domestic sources)

Where these pollutants enter the river at an individual point, it is known as ‘point source pollution’ and where it enters over a wide length of the river, this is known as ‘diffuse pollution’.

The industries that most impact water quality are agriculture and sewage treatment, though inputs from roads, homes and gardens should not be overlooked.

A cost-effective way of monitoring the impacts of these pollutants is through looking at the presence or absence of riverfly species, such as dragonflies, and mayflies.

Nutrients

Riverfly monitoring of pollution sensitive species at Yondover indicates that the site is high quality, with increasing numbers of pollution-intolerant species.

Suspended solids

Riverfly monitoring of silt-tolerant species indicates that the River Asker has in the past been moderately sedimented but has improved and is now slightly sedimented.

Pesticides

Riverfly monitoring of pesticide tolerant species indicates that there has been a moderate impact in the past, but the situation has improved and now there is little impact on the invertebrate assemblages from pesticides.

Combined

The Number of Scoring Taxa (NTaxa) index provides an overview of the state of the waterbody, as it reflects multiple pressures. Individually, as described above, the condition of the Asker is High. However, the Ntaxa data shows that the combined pressures are having an impact and the condition of the River Asker has declined slightly since 2012.

Water quantity

Flooding and drought can cause major disruption as well as environmental damage. Drought can lead to concentration of pollutants, poor habitat quality and increased fine sediment deposits. Flooding can lead to damage to homes, businesses and farmland. It can also lead to greater phosphorous concentrations and sedimentation in the river.

Climate change will lead to drier summers and more drought conditions. Models also predict increased storminess, so when it does rain, it is more likely to lead to flooding. This is predicted for both summer and winter.

The magnitude of flooding can be exacerbated by poor land management practices, new development, blocked drains and gullies and highways acting as pathways.

Habitat quality

The historical uses of the river may be impacting the species that live within the river. The fish population on the River Asker have been classified as poor, because there are less species there than you would expect from a river of a similar type and this may be due to old weirs within the river.

The aquatic plant population on the River Asker has been classified as poor. Though the primary reason for this is thought to be nutrient pollution, there may also be too much shade from bankside trees for plant life to grow.

There are a few invasive species known to live in and along the River Asker. These impact our native species by either outcompeting them, transferring diseases or eating them. The most problematic of these are:

- Himalayan balsam (outcompeting)
- Japanese knotweed (outcompeting)
- American mink (eating)

- Signal crayfish (disease)

Summary

The main issues affecting the River Asker can be summarised as:

1. **Artificial barriers:** this impacts fish populations and causes sediment to deposit on the river bed
2. **Shade from riparian trees:** this impacts aquatic plants and riverside plants.
3. **Catchment land use:** this has the potential to make worse the length and severity of flood waters and is a source of sediment.
4. **Agricultural nutrients:** this impacts aquatic plants.
5. **Invasive species:** this impacts riparian plants and causes bank erosion, which is a source of sediment.

Figure 5: Invertebrate modelling data that shows the wider response of invertebrates to environmental pressures in the River Asker at Yondover

6.

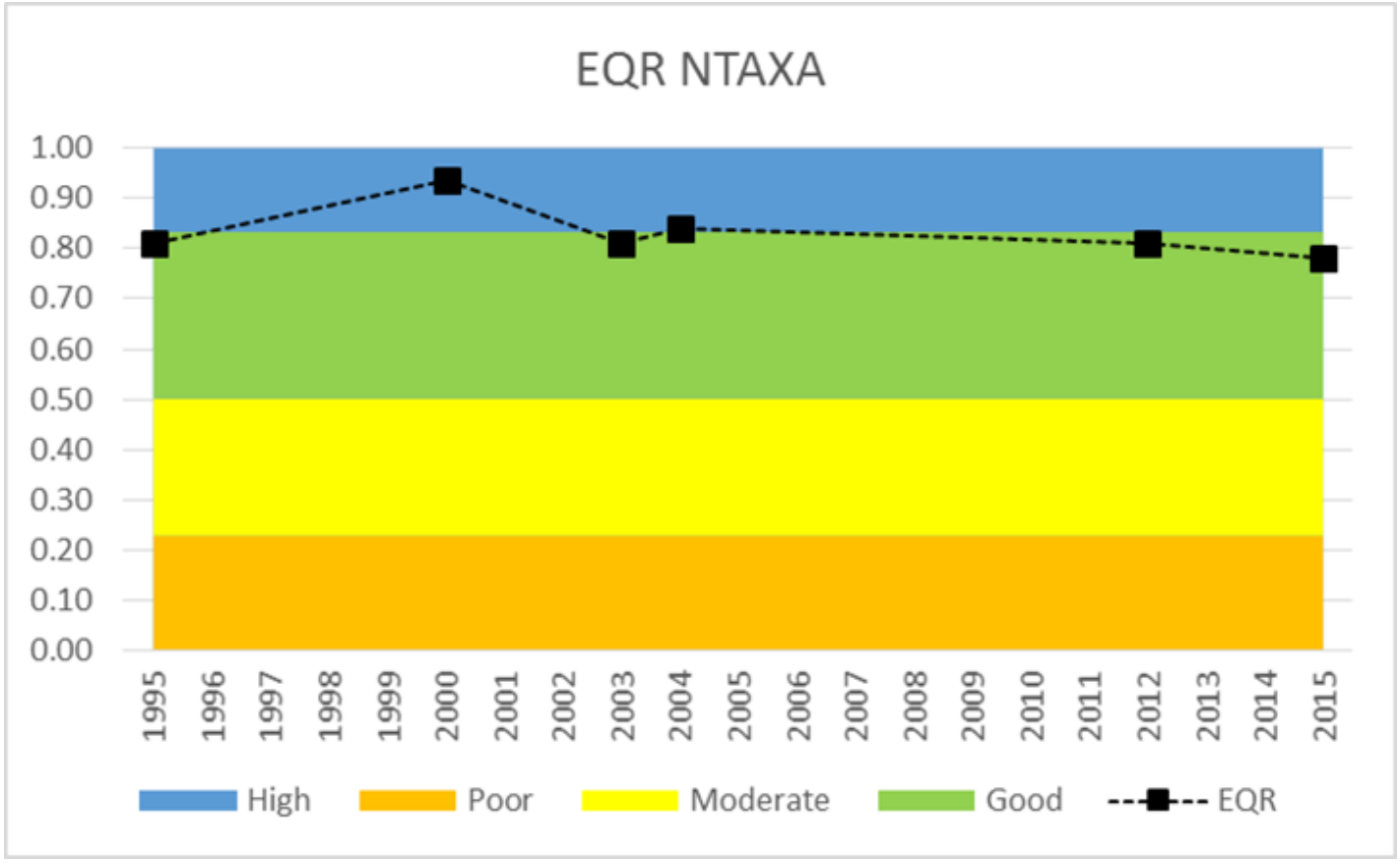
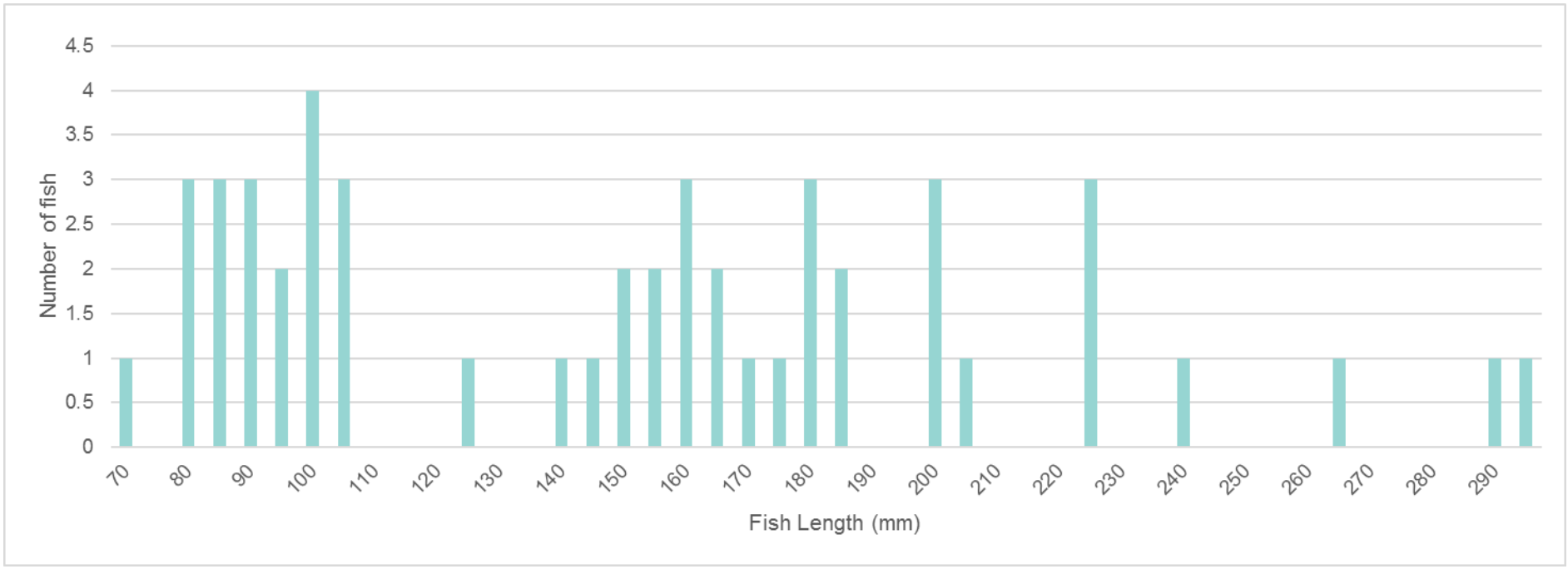


Figure 6: Number and length of brown trout caught downstream of Loders weir on 23rd October 2014 (5mm length intervals).



CATCHMENT OPPORTUNITIES

The identified issues can be addressed in a number of ways. The the most relevant solutions are summarised below:

For delivery by the community:

1. **Monitoring & education:** This 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.

For delivery by professionals, with support from the community:

2. **Shade management of riparian trees:** this would open up areas that are heavily shaded, allowing aquatic and riparian plants to thrive.
3. **Habitat improvement & restoration:** this would restore the natural processes of the river where it has been altered, therefore allowing natural process to occur. This would allow aquatic plants and fish species to thrive.
4. **Invasive species control:** *Plants*: this would allow native bank flora to thrive and reduce the potential for bank erosion, which is a source of sediment. *Animals*: mink control would reduce pressures facing the native water vole, which is fast-declining nationally.

For delivery by professionals in conjunction with land managers:

5. **Agricultural land management change:** this could reduce sediment runoff and therefore nutrient pollution. It could also improve rainwater infiltration and therefore delay and reduce flood peaks.
6. **Natural Flood Management:** by slowing flow of water over land and in the headwaters of the River Asker, through gully blocking, installation of woody debris dams and tree planting in appropriate locations. This would delay and potentially reduce flood peaks and reduce sediment runoff.
7. **Installation of fencing, cattle drinking bays and cattle crossing points:** this would reduce the amount of erosion, which is a source of sediment.
8. **Barrier removal or bypass:** this would benefit the fish populations in the river, by opening a greater length of river for spawning and reducing the amount of sedimentation.

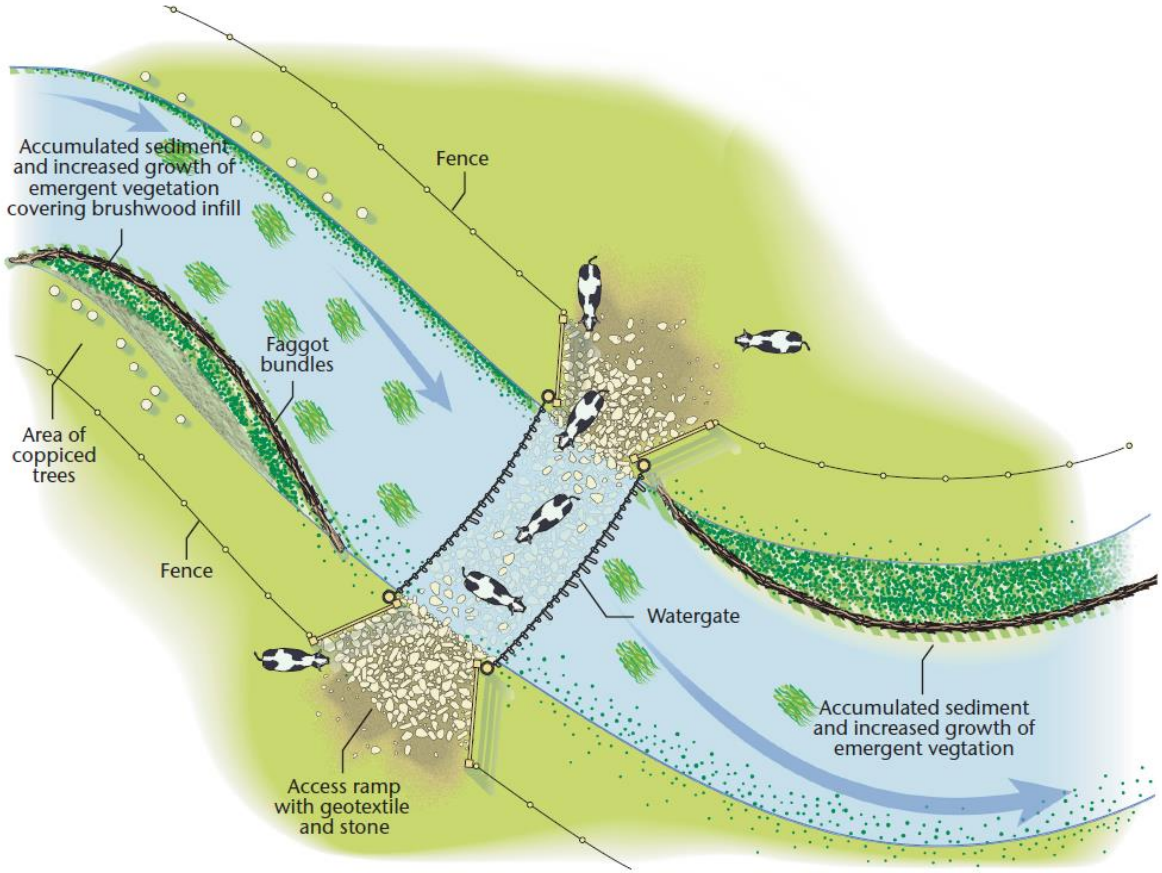


Figure 7: Diagram showing tree coppicing and protected marginal habitat through the erection of fencing, and well-designed crossing places and / or drinking bays.

CATCHMENT OPPORTUNITY MAPS

Over the summer of 2018, surveys were carried out, where land owner permission was secured, along the length of the River Asker and its tributaries. The following section presents maps that illustrate the findings of these surveys. The survey sections are outlined in Figure 8. The maps should be viewed in conjunction with the previous sections.

The purpose of the walk-over was to identify issues linked to the issues described in ‘Catchment Pressures’ and identify feasible opportunities for tackling these through solutions described in ‘Catchment Opportunities’. The survey gives are not exhaustive, as resources did not allow for this approach. However, it highlights general areas of concern and opportunity and more details will be gained prior to undertaking any solutions.

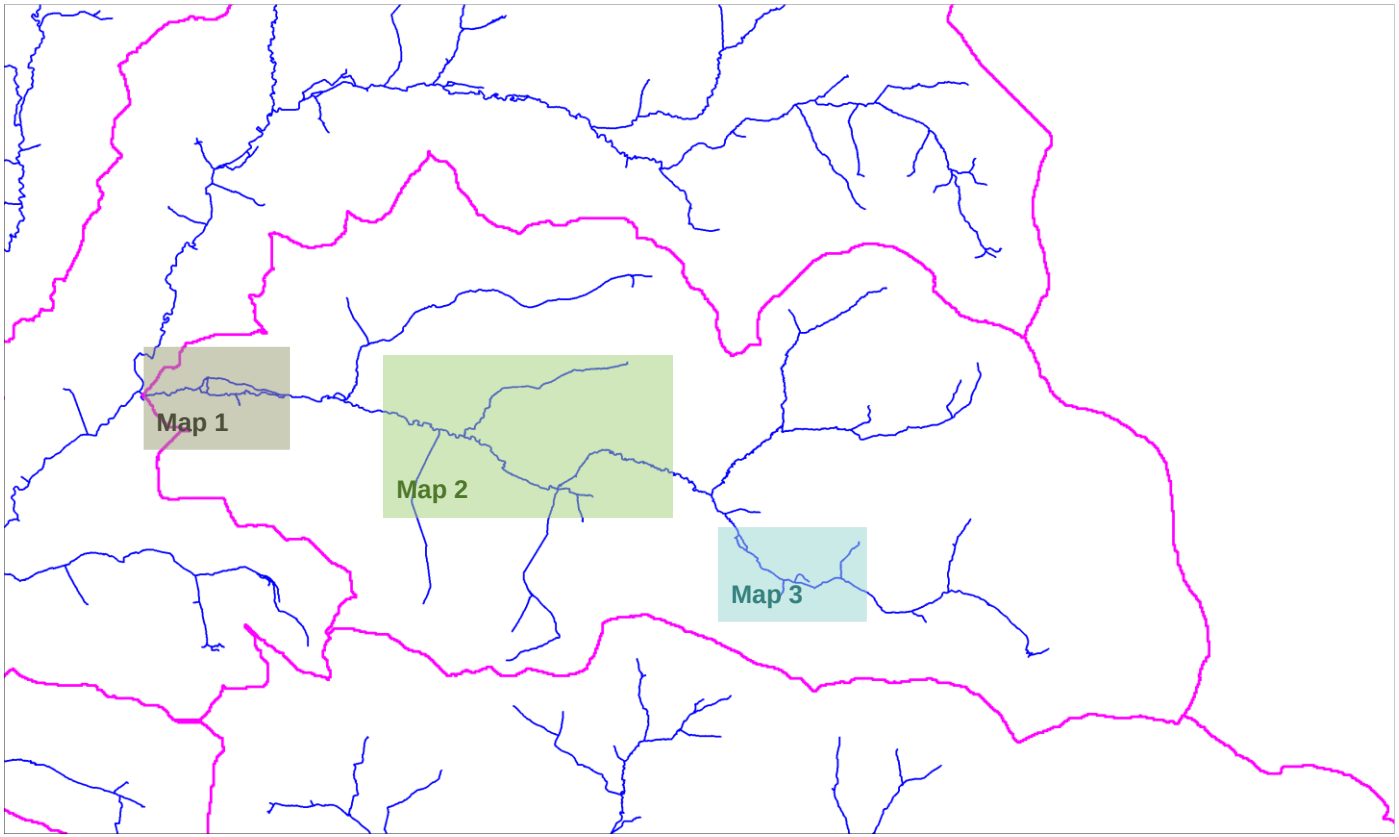
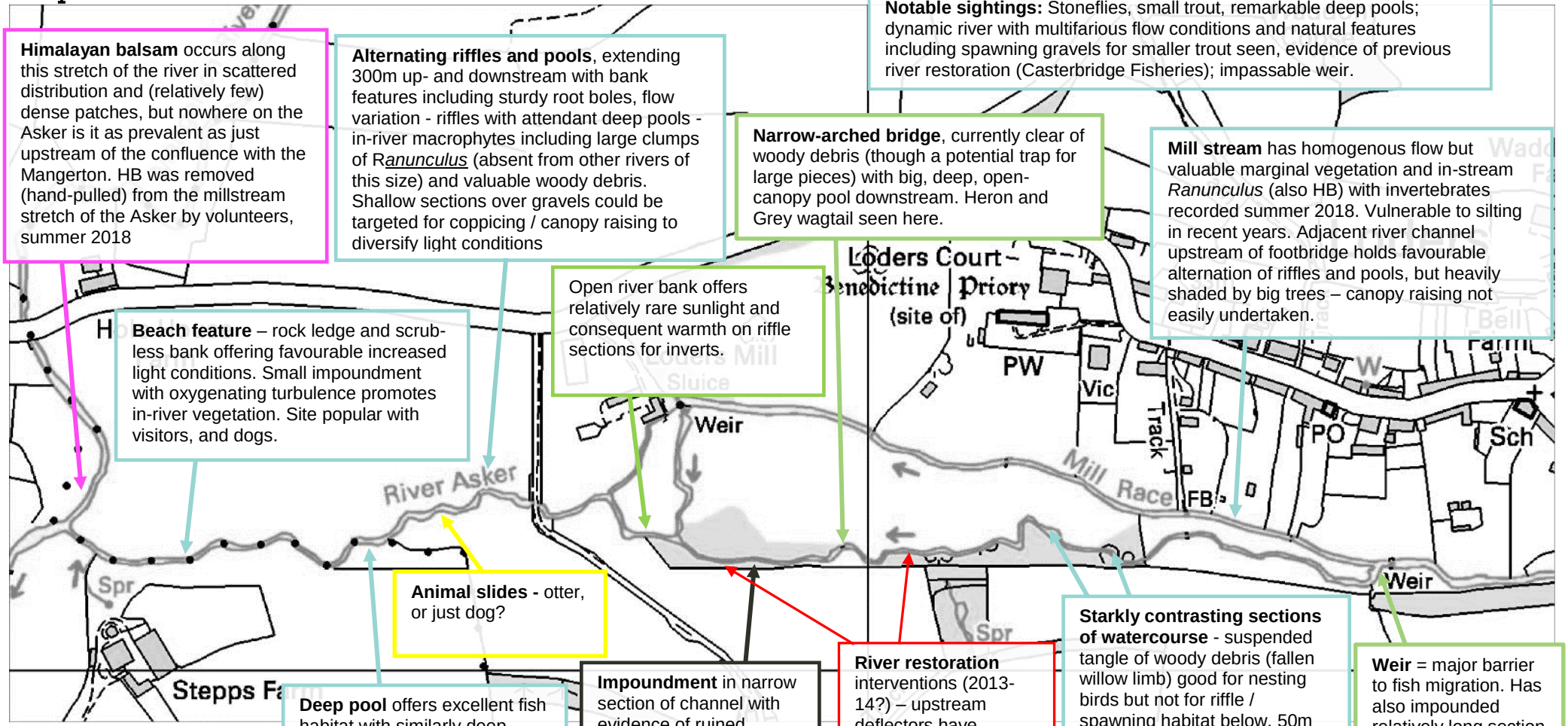


Figure 8: Map showing the reach maps for the sections of the River Asker and its tributaries, surveyed in 2018.

Map One: Loders



Himalayan balsam occurs along this stretch of the river in scattered distribution and (relatively few) dense patches, but nowhere on the Asker is it as prevalent as just upstream of the confluence with the Mangerton. HB was removed (hand-pulled) from the millstream stretch of the Asker by volunteers, summer 2018

Alternating riffles and pools, extending 300m up- and downstream with bank features including sturdy root boles, flow variation - riffles with attendant deep pools - in-river macrophytes including large clumps of R*anunculus* (absent from other rivers of this size) and valuable woody debris. Shallow sections over gravels could be targeted for coppicing / canopy raising to diversify light conditions

Notable sightings: Stoneflies, small trout, remarkable deep pools; dynamic river with multifarious flow conditions and natural features including spawning gravels for smaller trout seen, evidence of previous river restoration (Casterbridge Fisheries); impassable weir.

Narrow-arched bridge, currently clear of woody debris (though a potential trap for large pieces) with big, deep, open-canopy pool downstream. Heron and Grey wagtail seen here.

Mill stream has homogenous flow but valuable marginal vegetation and in-stream *Ranunculus* (also HB) with invertebrates recorded summer 2018. Vulnerable to silting in recent years. Adjacent river channel upstream of footbridge holds favourable alternation of riffles and pools, but heavily shaded by big trees – canopy raising not easily undertaken.

Open river bank offers relatively rare sunlight and consequent warmth on riffle sections for inverts.

Beach feature – rock ledge and scrub-less bank offering favourable increased light conditions. Small impoundment with oxygenating turbulence promotes in-river vegetation. Site popular with visitors, and dogs.

Animal slides - otter, or just dog?

Deep pool offers excellent fish habitat with similarly deep shade keeping temperature relatively constant. Apparently clean inflow - from field drainage?

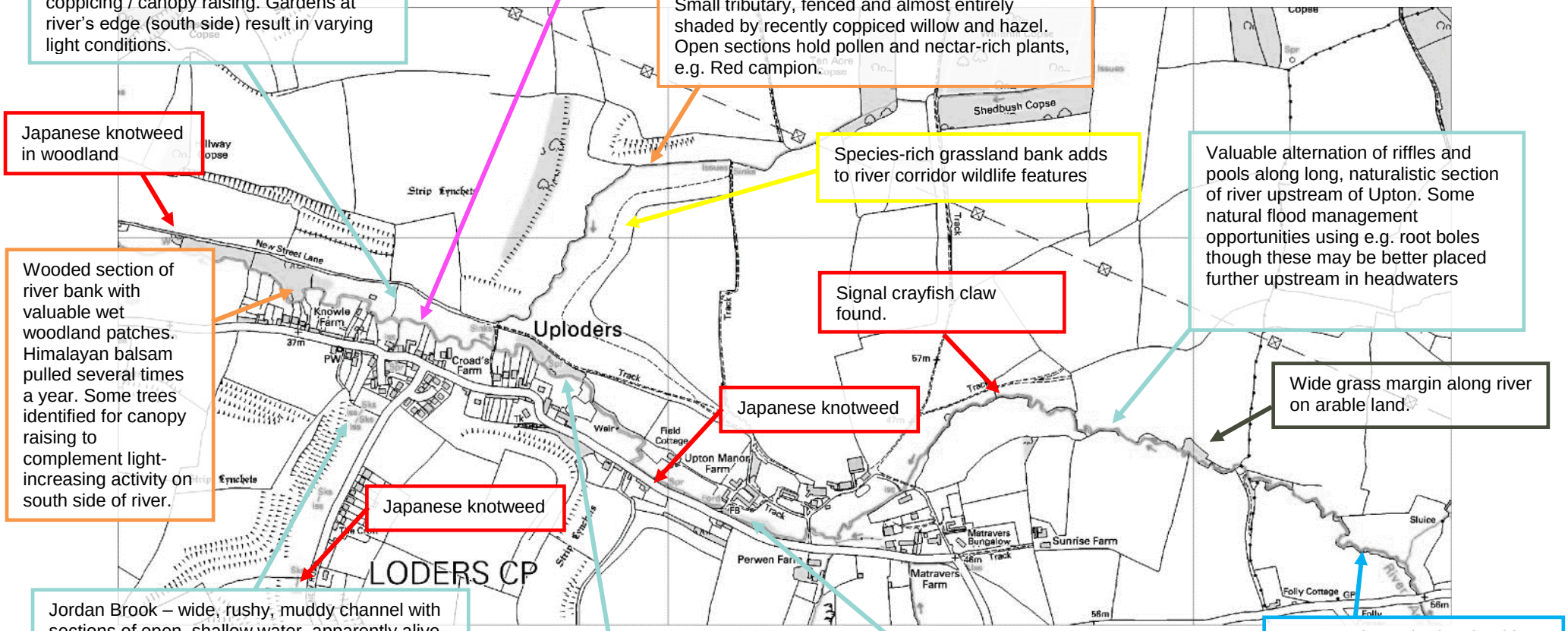
Impoundment in narrow section of channel with evidence of ruined masonry? Valuable tangle / thicket of woody debris and aeration of water falling through the obstacle.

River restoration interventions (2013-14?) – upstream deflectors have captured sediment and narrowed channel for effective gravel washing…

Starkly contrasting sections of watercourse - suspended tangle of woody debris (fallen willow limb) good for nesting birds but not for riffle / spawning habitat below. 50m long section of deep water upstream, with fish. As with much of the river upstream of confluence with mill stream, much heavy shading from scrub woodland on southern bank.

Weir = major barrier to fish migration. Has also impounded relatively long section of channel upstream.

Map Two: Uploders



Map Three: Askerswell

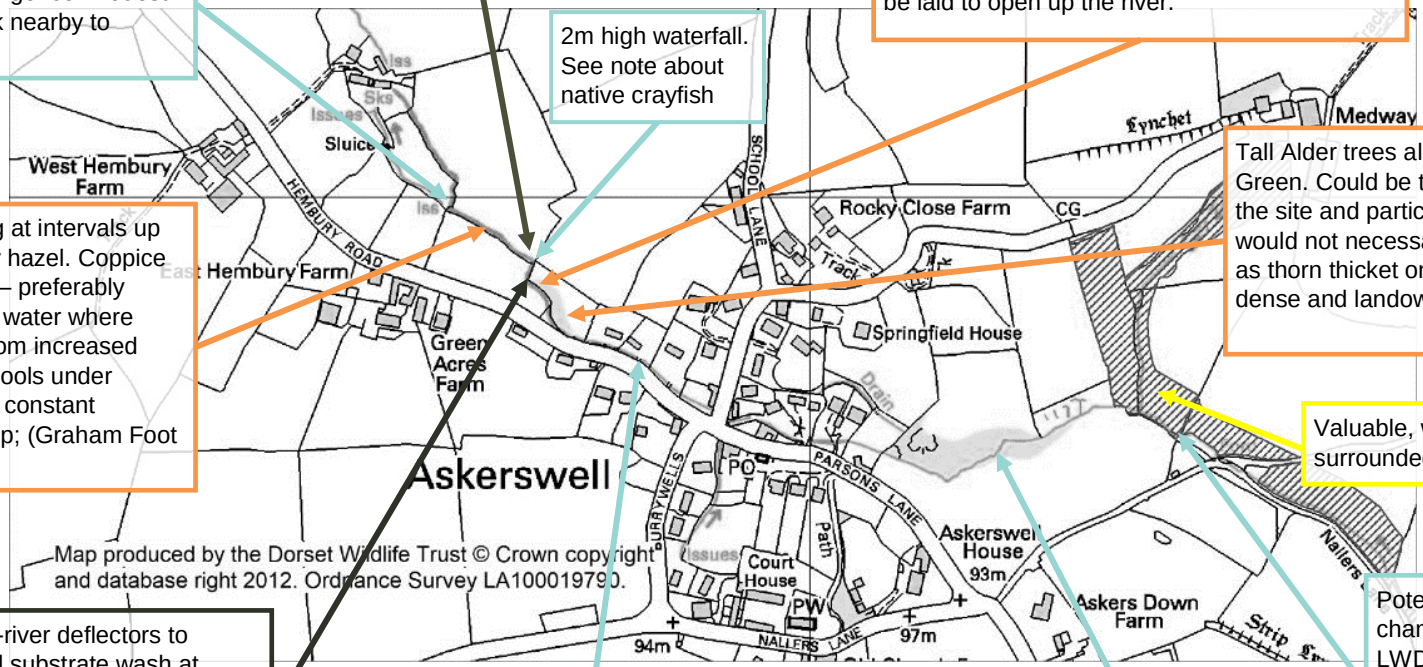
Bank erosion adjacent to major waterfall – construction of a brash mattress (in conjunction with nearby canopy raising) could help to alleviate erosion.

Crayfish: might the Asker headwaters be a refuge for our native crayfish, protected from alien species by the major waterfall barrier below Washingpool Green? Surveys could be undertaken to establish the suitability of existing habitat, presence or absence of crayfish and feasibility of re-introduction if appropriate.

Possible Natural Flood Management - large woody debris (LWD) dam to attenuate river flow above millstream divergence. Modest pool upstream, fallen trunk nearby to provide material

Hedge at west end of Washingpool Green could be laid to open up the river.

2m high waterfall. See note about native crayfish



Tall Alder trees along river in Washingpool Green. Could be thinned to let more light into the site and particularly the pond, though this would not necessarily increase light to the river as thorn thicket on opposite (south) bank is dense and landowner is not keen to alter this.

Potential for canopy raising at intervals up this length of river – mostly hazel. Coppice trees at e.g. 30m intervals – preferably adjacent to riffles / shallow water where invertebrates will benefit from increased light and warmth, leaving pools under canopy to maintain a more constant temperature for fish to lie up; (Graham Foot & Sean Webb)

Valuable, wet, tussocky SNCI grassland surrounded by big bushy hedges

Potential bank works or in-river deflectors to alleviate overland flow and substrate wash at times of high flow; (Graham Foot). Also potential to pollard ash tree at south end of footbridge to prevent it toppling and thereby maintain bank integrity

Engineered channel between SY52759287 and SY53079275 channels river rapidly through the village – little potential for restoration works. Question as to whether this kind of water environment is suitable for crayfish?

Appealing, naturalistic channel with alternating riffles and pools, flanked by open, grazed woodland with several beautiful mature and over-mature oak trees; (Geoff Barrett). Some bankside coppicing could diversify light conditions.

Potential NFM site – river channelled between old wall where LWD could create temporary wetland and attenuate high flows in major rainfall events. Specialist opinion should be sought.

SUMMARY

Despite the Environment Agency's classification, the overall condition of the Asker appears to be relatively healthy. It is, however, suffering a similar fate to many lowland streams in England. With signs of agricultural runoff, abandonment of riparian management leading to increased shade, sedimentation in areas of impoundment, as well as significant issues regarding fish passage; the main reason that the river is classified as poor.

Many of these issues can be tackled by low-tech solutions. For example, managing the impact of shade by canopy raising, restoring natural channel processes by instream improvements as well as improving management of the wider catchment by working with land owners and managers. If time and resources permit, then the issue of fish passage could be tackled, but this would be a major undertaking. Many of these solutions could be delivered with the help of volunteers from the local community.

As well as improving the condition of the river environment, there are also opportunities to improve the flood response of the catchment, again through work with landowners and managers by altering land management techniques at sensitive locations and slowing the flow through the installation structures and creating areas to hold water that can reduce the intensity and duration of flood events.

This report is a snapshot in time, bringing together information that is currently known about the state of the River Asker and identifying opportunities to improve its condition. More information may come to light in the future and new techniques may be developed to help deliver what we want for the river. However, the most important thing is to use the findings of this report, and the new and developed contacts made as a result of preparing it, to help plan action to enhance the environment and create a stronger connection between people and place.