

Trout Beck 1: Improve & protect fish habitat

What's the problem?

The water quality of rivers in the Trout Beck catchment has been identified as *unfavourable** due to high levels of phosphorous. *Site of Special Scientific Interest (SSSI) classification

Whilst doing previous surveys, other issues affecting the river habitat were found. These included: excessive riverbank erosion, areas with little or no tree cover and sections of rivers that were lacking in natural river features that support aquatic wildlife.

In places, livestock can access the river - trampling vegetation and eroding riverbanks. Silt is formed as a result, which ends up in the river - impacting on plants, creatures and fish eggs.

What are we planning to do?

Carry out walkover surveys and desk-based feasibility studies to identify sites where habitat can be improved.

In 2020/21 we will carry out capital works to improve and protect fish habitat such as:

- **In-channel woody debris management,**
- **Fencing along watercourses,** (and providing alternative watering for livestock)
- **Tree planting and coppicing on riverbanks,**
- **Improvements to river crossings, cross drains in farm tracks.**



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What will it look like afterwards?

The Trout Beck catchment will be healthier - with cleaner water, greater biodiversity and more species.

Working with farmers to implement water-friendly farming methods and practices helps to manage water more effectively, optimise soils and reduce the amount of nutrient-laden run-off reaching the river.

As they grow, trees will provide shade for aquatic wildlife and keep the water cool, soak up rainwater (improving flood resilience) and store carbon.

Thanks to fencing and planting along rivers, livestock is kept out of the water. As a result, riverbanks are anchored by vegetation, making them stronger and less susceptible to excessive erosion. Livestock health may also be improved as they are less likely to become lame or catch water-borne diseases.

As fish numbers increase, oxygen regulation and nutrient cycling improves, which further enhances water quality.

Without fine sediment and silt entering the river, the riverbed is made up of a healthy mix of gravel sizes that provide vital fish spawning and invertebrate habitat.

Aquatic plants also flourish, helping to provide 'roughness' which slows the speed of water and creating a natural flood management benefit.



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Trout Beck 2: Target modified channels

What's the problem?

Several sections of rivers in the Trout Beck catchment have been artificially modified or straightened, removing natural river features such as pools, riffles (where water flows over rocky or shallow parts of the stream), gravel bars and meanders (bends in the river).

As a result, this reduces the variety of habitats and species needed to support a healthy ecosystem and increases the potential risk of flooding downstream.

We have also identified barriers in river channels - such as weirs and other structures, which could be a barrier to fish movement and make it difficult for them to reach vital spawning areas upstream.



What are we planning to do?

Barrier removal:

Carry out feasibility studies and prepare designs for the removal of barriers to fish passage. This could involve removing barriers entirely (for maximum benefit) or the creation of fish passes or easements.

River restoration:

A site has been identified that would benefit from river restoration works. Historically straightened for agricultural reasons, it lacks natural river features and does not support a wide range of habitats or species. We will:

- **Carry out feasibility studies and prepare designs for river restoration features,**
- **Monitor the levels of fish before and after construction, to show the impact on the fish community.**



What will it look like afterwards?

The catchment will have a larger network of natural rivers that enable free movement of fish as well as improve biodiversity.

By improving fish passage, fish will be able to move freely throughout the catchment. This will improve species distribution and create the right conditions for fish to grow and live there throughout all stages of their life cycle.

River restoration has many benefits. Re-establishing natural features such as meanders, riffles and pools will create areas of faster, shallow water and deeper, slower-moving water where fish can hide. Meanders also allow gravel and aquatic plants to settle on the riverbed.

Natural rivers have a more varied habitat and better water quality that will support greater biodiversity and increase fish and invertebrate populations.

Removing barriers will improve the movement of sediment, allow the natural water level to be maintained along the channel, and reduce build up of silt. It can also provide flood management benefits.

Trout Beck 3: Remove invasive non-native species

What's the problem?

Invasive non-native plants create a host of problems in the catchment. One of the most widespread plants is Himalayan balsam. Originally introduced to the UK as an ornamental garden plant, it is now found along most river banks.

It grows quickly and shades out and out competes with native species in ecologically sensitive areas such as the Eden catchment. During winter it dies back, leaving river banks bare and exposed to erosion. Other invasive non-native plants found in the catchment include Japanese Knotweed and Giant Hogweed.

What are we planning to do?

In 2019, we will:

- Engage ecological consultants to carry out surveys and walkovers of sites where the presence of invasive non-native plants has been identified, to plot each occurrence and record key information.
- Develop an invasive weed control management plan with the objective of obtaining long term control of the problem.
- Hold workshops on how to identify invasive non-native species.

In 2020/2021, we will:

- Employ invasive weed technicians to chemically treat identified plants/sites in early summer.
- Launch initiatives to encourage local people and angling clubs to identify and report potential sites.
- Run 'balsam bashing' events for volunteers.



What will it look like afterwards?

There will be more space for native species to grow and thrive in the Trout Beck catchment.

There will be less bank side erosion, which in turn reduces the amount of fine sediment entering the river.

This will result in an improved in-stream habitat that can support a greater diversity of wildlife.

Removing invasive non-native plants that cast a lot of shade will let more light reach the river, improving the biodiversity of aquatic wildlife, such as fish and invertebrates.



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