

Rivers and streams

WHAT ARE RIVERS AND STREAMS ?

Rivers and streams are naturally dynamic habitats with a constant flow of water. Confined by geomorphology, numerous small streams combine to form ever-larger rivers, which flow from upland to lowland, finding the easiest route to the sea. Such dynamic systems provide a wide range of ecological niches supporting a diverse flora and fauna.

The constant movement of water causes a scouring motion which, alone or in combination with changes in rainfall and run-off, can alter the course of the waterway. The associated features such as sand and shingle, marginal and bankside vegetation form an integral part of the stream or river and contribute to the associated wildlife that they can support. They also greatly influence the landscape characteristics of the surrounding catchment.

Watercourses fulfil a range of important socio-economic functions such as water supply, pollution dispersal, provision of amenity and acting as a biodiversity resource.

Rivers can also have an impact on adjacent land through flooding and erosion. For these reasons rivers have been heavily managed in both rural and urban settings. It is essential that this management takes account of the need to maintain and improve the contribution made by these habitats to biodiversity, locally, nationally and internationally.

WHERE ARE THEY FOUND IN THE UK?

These habitats are found across the UK, although they vary considerably from one area to another.

WHY ARE RIVERS AND STREAMS OF CONSERVATION IMPORTANCE?

Many of the species that occur in rivers and streams are entirely dependent on the habitat for part or all of their lifecycle and are unable to adapt to other environments. Rivers and streams are important as wildlife corridors supporting a rich diversity of species, reflecting a mosaic of habitats.

RIVERS AND STREAMS IN THE DURHAM AREA

WHAT IS THE STATE OF RIVERS AND STREAMS IN THE DURHAM AREA?

There are currently no rivers or streams in the Durham area designated as SSSIs specifically for their biodiversity value, although the River Tees, within the Upper Teesdale NNR, is cited as an example of a good upland river. Many of the smaller upland streams in Upper Teesdale are near pristine while there are many of very high biological quality in Upper Weardale.

The biological water quality of the rivers and streams of the area is varied, although over half are considered to be of a high standard. The majority of the "good" rivers, classes A and B, are in the uplands whilst those classified as poor or bad are normally found in the

industrial areas to the east e.g. the River Team or Castle Eden Burn. Poorer water quality is often associated with lowland reaches flowing through urban and industrial areas, however these may be able to support endangered species such as the water vole; the rivers Don and Skerne being two such examples.

The rivers Wear and Tees support important stocks of migratory *Salmonids*. In recent years the number of sea trout returning to spawn in these rivers has been increasing. Salmon also appear to be increasing in numbers. These rivers also have diverse non-migratory fish communities including brown trout, grayling, lamprey and a range of coarse fish species including: dace, chub, gudgeon, bream, eel, stone loach, minnow and bullhead. Improvements in water quality, the removal of obstructions, improvements to habitats and anti-poaching strategies have all contributed to the upsurge in fish stocks in local watercourses.

Rehabilitation work is being undertaken or investigated in several areas including the River Team. Restoration of a length of the River Skerne, is an example of what can be achieved in restoring natural hydrological features to a polluted and previously heavily managed watercourse.

Even the smallest watercourses often provide an important amenity resource and riverside access affords the possibility for a wide body of people to experience freshwater and its associated habitats.

WHERE DO THEY OCCUR IN THE DURHAM AREA ?

The major rivers in Durham are the Tyne, Derwent, Tees and Wear. There is thought to be over 350km of main river in Durham. Smaller watercourses such as streams have not been measured. They are found across the Plan area.

RIVERS AND STREAMS ARE AT RISK FROM:

Pollution - Many different forms of pollution occur. Particularly pertinent to the uplands, synthetic pyrethroids - used in sheep dips - if allowed to enter the river system these are extremely toxic to aquatic invertebrates. Agricultural run-off of artificial fertiliser or slurry can enrich waterways and reduce oxygen levels to the detriment of the range of invertebrates and plants. Sewage outfalls can have similar effects, all of which affects those species dependent on clean, well-oxygenated water, e.g. brown trout. The downstream consequences of such nutrient enrichment (eutrophication) are likely to be considerable for most watercourses. Chemical pollution may arise from industrial sites and mines, particularly abandoned workings; this takes the form of both one-off occurrences and long-term leakage. Extant landfill sites may also produce leachate.

"Hard" engineering and drainage operations - "Hard" engineering is the use of heavy machinery and materials such as concrete and steel to manage rivers including culverting and canalisation. Drainage operations include

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the removal of areas of floodplain, wetland habitats and the removal of landscape features such as oxbows and meanders. Whilst the aim, of much of this work, is to reduce the risk of flooding in built-up areas, frequently the consequence is to move the flood risk further downstream. Drainage schemes undertaken to improve agricultural productivity can result in the loss of wetland habitats including ditches and ponds and can impact negatively on small streams. Unsympathetic hard engineering options may result in the loss of bankside vegetation, reduction in stream habitat diversity and a decrease in the number of associated species such as water vole, otter and kingfisher.

Abstraction - The increasing demand for water is associated with the development of, and demand for, irrigation and greater levels of hygiene in both industrial and domestic environments. In some situations water is abstracted directly from rivers which could have long-term effects on the volume of water in the river and for instream habitats.

Upland drainage - The use of "grips" in the uplands to drain areas of moorland can lead to high levels of run-off and siltation, particularly at times of high rainfall, leading to increased floods.

Changes in upland vegetation - Blanket bog and tree cover in the uplands act as "sponges" soaking up rainfall and gradually releasing water. Removal of these habitats has resulted in much quicker run-off at times of high rainfall and reduced infiltration of water into the ground. There is a consequent greater variation in river water levels, with increased risk of floods in floodplains as well as increased erosion and changes to silt deposition patterns.

Over-grazing of bankside vegetation - This leads to the loss of bankside vegetation, the subsequent erosion of river margins and siltation of the river channels, with consequent loss of fish spawning gravels and habitat diversity.

Invasion of non-native species - The introduction of non-native species such as Himalayan balsam, giant hogweed and Japanese knotweed can result in significant management problems; all three species can spread to the extent that they dominate riverbanks. American mink are thought to be a major factor in the decline of water voles.

Fish poaching.

Disturbance - Both bankside and waterborne, many people see rivers principally as a recreational resource.

RIVERS AND STREAMS BENEFIT FROM:

Moorland conservation including grip blocking, reduction in sheep grazing and native tree planting which would reduce runoff rates. A reduction of bankside grazing through appropriate fencing and tree planting

schemes along downstream sections would also be beneficial.

"Soft" engineering - Using trees, shrubs and grass species to stabilise riverbanks as part of an integrated approach to land management and flood control can minimise negative impacts upon natural features such as oxbows, meanders and flood meadows.

Development of shingle and gravel.

Managing livestock access to the river to prevent over-grazing along the entire length.

Sustainable development of housing and industry. Sensitive siting can help to maintain and improve those features for which adjacent development would be detrimental. Incorporation of sustainable drainage techniques can help to minimise the impact of high flows and pollution on surface water.

Use of filtration and treatment methods at industrial and sewage facilities.

Rehabilitation works at the river catchment level.

Greater public understanding of the important role of rivers and an appreciation of their dynamic nature, wildlife and landscape value.

OTHER FACTORS AFFECTING THE CONSERVATION VALUE OF RIVERS AND STREAMS:

Inter-basin transfers of water .

Angling.

Fish stocking.

IMPORTANT SPECIES FOR RIVERS AND STREAMS:

<i>Otter</i>	**	<i>Brown trout</i>
<i>Water vole</i>	**	<i>Grayling</i>
<i>White-clawed crayfish</i>	**	<i>Salmon</i>
<i>Dipper</i>		<i>Lamprey</i>
<i>Kingfisher</i>		<i>Bullhead</i>
<i>Common sandpiper</i>		

OTHER HABITAT ACTION PLANS COVERING ISSUES RELEVANT TO RIVERS AND STREAMS :

<i>Urban</i>	*
<i>Wet woodland</i>	**
<i>Upland heathland and blanket bog</i>	*
<i>Lowland meadows and pastures</i>	**

N.B. ** indicates action plan produced in 1998.

* indicates action plan produced in 2000.

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TARGETS FOR THE CONSERVATION OF RIVERS AND STREAMS IN THE DURHAM AREA :

- DATE**
- Target 1** *Maintain existing good ecological water quality and make progress to achieve good ecological quality elsewhere.* **ONGOING**
- Target 2** *Maintain and enhance the biodiversity value of all rivers and streams in Durham.* **ONGOING**

- Target 3** *Target areas of river for habitat rehabilitation work to benefit wildlife conservation.* **2005**
- Target 4** *Raise awareness of the dynamic nature of rivers and implement suitable management techniques.* **ONGOING**

RIVERS AND STREAMS ACTIONS :

ACTION	DATE	POSSIBLE PARTNERS	MEETS TARGET NO.
POLICY AND LEGISLATION			
1. Consider designation of stretches of river as second tier wildlife sites and Local Nature Reserves as appropriate.	2005	EN, LAs, EA, Land owners	2,3
2. Raise awareness of the dynamic nature of rivers and the importance of floodplains at planning level.	2004	LAs, EA	4
3. Work through existing structures to enhance the biodiversity interest of rivers and streams e.g. LEAPs and Estuary Management Plans.	2005	LAs, EA, Land owners	1,4
SITE SAFEGUARD AND MANAGEMENT			
4. Ensure positive management for all designated sites (e.g. LNRs, County Wildlife Sites)	2004	EN, LAs, MAFF, Land owners	1
5. Implement a programme of work to improve the water quality of rivers and streams.	2004	EA, NWL, Industry, OARP	2
6. Actively manage associated <i>Salmonid</i> and coarse fisheries to conserve salmon and other fish stocks whilst maintaining other biodiversity interest.	ONGOING	EA, EN, LAs, Land owners, River Wear Environment Trust, OARP	2
7. Manage flood defence operations to ensure unavoidable impacts on habitat quality are both minimised and mitigated by associated conservation improvements.	ONGOING	EA, LAs	2,3
RESEARCH AND MONITORING			
8. Monitor ecological water quality to inform management of watercourse.	2004	EA, OARP	1,2
9. Instigate research and monitoring programme for rivers and streams, species and habitats.	2004	EA, EN, DBAP, OARP	1,2
ADVISORY			
10. Provide advice to land managers on river catchment management	ONGOING	EA, DBAP, OARP	1,2
11. Provide advice to planning authorities and developers on sustainability issues of rivers and streams	ONGOING	EA, DBAP, LA21	1,4
COMMUNICATIONS AND PUBLICITY			
12. Raise awareness of the biodiversity value of rivers and streams	ONGOING	DBAP, EA, OARP	4