

RIVERS AND STREAMS

DEFINITION

Rain which falls on the land eventually finds its way into streams and rivers. The North Devon's Biosphere Reserve includes the North Devon countryside which connects all the streams to the Taw and Torridge rivers and then to the Taw-Torridge estuary. The reserve also includes the streams and rivers running into the sea from Hartland to Lynton.

This plan considers the river or stream channel, the banks of the channel and the land immediately adjacent to the bank. Collectively this is referred to as the riparian zone. The plan also includes linked habitats in the floodplain, where these are not included in the Estuary or Enclosed Farmland sections of this document.

The water, banks and adjacent vegetation provide a range of habitats for plant and animal species which vary along the stream or river's course. These habitats are important wildlife corridors through the countryside, villages and towns, and link other important habitats such as Culm grassland and woodland.

DISTRIBUTION

The two largest rivers in North Devon are the Taw and the Torridge. In addition, a number of smaller watercourses flow either into the Taw Torridge Estuary or directly into the sea.

The area is mostly rural. The Torridge has its headwaters near Hartland, the Taw and Okement rise on Dartmoor and the Mole rises on Exmoor. The soils, underlying geology and topography mean that North Devon rivers rise quickly in response to heavy rain, but reduce equally quickly. The Taw and Torridge in their middle and lower sections are set in steep sided valleys with a mixture of farmland and woodland along valley floor. Extensive areas of semi-natural broadleaved woodland cover the steep valley sides. River bank trees are common, providing cover for the otters that make this 'Tarka Country' famous.



Most of the rivers in the Biosphere Reserve regularly meet the quality expected of unpolluted watercourses. This is a national statutory measure and water quality may still be inadequate from a strictly ecological perspective, particularly for those species that are sensitive to excessive nutrient and sediment such as the freshwater pearl mussel.

The area supports high quality game fisheries with angling taking place throughout the catchment. The most notable fish are Atlantic salmon, sea trout and brown trout. As with most British rivers, salmon numbers have declined significantly in recent years. Conservation limits have been set for Devon's salmon rivers; in North Devon only the Lyn is meeting this target level. Stocks of sea trout and brown trout are in a better state, but catches of sea trout have also declined. The Dartmoor SAC is designated for salmon and includes the headwaters of the Taw, East Okement and West Okement. The main rivers downstream of the SAC are recognised as essential migratory routes requiring adequate flows for migration and an absence of barriers to fish passage.

There are some local recreation activities such as canoeing and kayaking which take place on the Rivers Taw, Torridge, Okement and Lyn. Rivers and streams are an important component of public 'green space' in town and villages, for example in Okehampton (Okement), Braunton (Caen), Bideford (Kenwith Valley), and Barnstaple (Whiddon Valley).

LOCATIONS

Taw and north Devon streams (catchment approx. 1440km²)

- The River Taw from its headwaters on Dartmoor at Taw Head above Belstone (550 m above sea level) to the Taw Estuary at Newbridge upstream of Bishop's Tawton.
- The rivers Bray, Mole, Little Dart, Dalch and Lapford Yeo are the main tributaries of the Taw. The Mole has its headwaters on Exmoor.
- The Barnstaple Yeo, Bradiford Water and Caen flow directly into the Taw estuary.
- Umber, Heddon, West Lyn and East Lyn rivers on the Exmoor coast between Ilfracombe and Lynmouth.

Torridge and Hartland streams (catchment approx. 925km²)

- The River Torridge from its headwaters at Baxworthy Cross between Hartland and Woolsery (220m above sea level) to the Torridge estuary near Weare Giffard.
- The rivers Lew, Waldon and Okement are major tributaries of the Torridge. The Okement rises on Dartmoor.
- The Bideford Yeo flows directly into the Torridge estuary.
- Welcombe Stream, Hartland Stream and Abbey River on the north Devon coast near Hartland.

CHARACTERISTIC WILDLIFE

Mammals:	Otter, bats (esp. Daubentons), water shrew.
Birds:	Goosander, dipper, grey wagtail, kingfisher, sand martin, common sandpiper, grey heron.
Fish:	Atlantic salmon, sea trout / brown trout, bullhead, lampreys, eel.
Insects:	White legged damselfly, beautiful demoiselle, beetles and flies associated with exposed river sediments.
Molluscs:	Freshwater pearl mussel.
Plants:	Mosses and liverworts including UK BAP multi-fruited river moss.

Case study: The freshwater pearl mussel

The Torridge, Taw and Mole are the only rivers in southern England which still support populations of freshwater pearl mussel. This bivalve was once so widespread that it was exploited for pearls, but decline in water quality and damaging river works have led to the extinction of many colonies. The freshwater pearl mussel is dependent on very good water quality and also the presence of juvenile salmon and trout to distribute the larval form. Unfortunately no juvenile mussels have been found in Devon for at least 40 years. A recent study has shown that the Devon population is genetically distinct from those in northern Britain. Protecting the remaining populations and establishing juvenile recruitment for this 'flagship' North Devon species is therefore of considerable importance.

THREATS

	Impact ✓	Significant impact ✓✓
	Historic	Current
Climate change		
Increased flood risk	-	✓✓
Reduced water availability for people and wildlife. Low flows can also concentrate the effects of pollution.	-	✓✓
Increased water temperature and its effect on aquatic life (particular concern about effects on salmon)	-	✓✓
Water availability		
Construction of dams and reservoirs	✓	-
Abstraction and consumption for public and private water supply, industry or agriculture	✓	✓
Deprived reaches due to abstraction for hydro-power generation, fish farming and to supply amenity features such as ponds or leats.	✓	✓
Physical modification		
Modification of river channel and banks for flood defence, bank protection, drainage or fisheries management	✓✓	✓
Inappropriate grazing and erosion by livestock	✓	✓

Destruction or inappropriate management of riparian and other associated wetland habitats resulting in habitat loss or fragmentation	✓✓	✓
Physical barriers to the passage of migratory fish and eels	✓✓	✓
Pollution		
Diffuse pollution (nutrients and sediments) from intensive agriculture	✓	✓✓
Point-source pollution from industry, agriculture and mineral extraction	✓✓	✓
Run-off from sheep dip and other pesticides	✓	✓
Sewage effluent and storm water overflows	✓	✓
Atmospheric pollution resulting in acidification	✓	-
Invasive species		
Invasive plants e.g. Himalayan balsam, Japanese knotweed, giant hogweed, montbretia	✓	✓✓

Discharge from sewage treatment works contribute nutrients to most of the rivers. Signs of nutrient enrichment are more noticeable at times of low flow and the ecology of certain reaches may be adversely affected. Land use, particularly in the upper parts of the Torridge catchment have an impact when nutrients and sediment is washed into streams and rivers. This is exacerbated by poor agricultural practices which can lead to compacted soils. Excessive nutrients (nitrate and phosphate) result in growth of algae and weed, which in turn affects the animal communities. Sediment washed in from soils or mineral extraction can smother the natural river bed and affect fish and other aquatic organisms.

The Barnstaple Yeo, Bradiford Water and Okement are considered over-abstracted according to the Environment Agency's Catchment Abstraction Management Strategies. Water abstraction may cause problems both directly and indirectly (see above). These impacts are likely to be made more severe as a result of climate change. Meldon Reservoir on Dartmoor has an impact on the West Okement.

SITE STATUS

Sites of Special Scientific Interest:	Halsdon SSSI (includes approx. 2.5 km of the River Torridge).
Local Nature Reserve:	Kenwith Valley LNR.
County Wildlife Sites with important watercourses:	Park Wood, Catham Lake Fields and Lower Wooda near Kings Nympton Highridge Wood and Stock Wood near Romansleigh Stock Wood near Ashmansworthy Marshall Farm near Atworthy

Rivers and Streams

CWS with important watercourses (continued):

Biteford and Runland near Atworthy
Clifford Farm
Volehouse Moor
Head Wood near Head Barton
Kennydown Farm near Bridge Reeve
Cott Cross and Stone Wood near Eggesford
Tawton Mill near Tawton
Trecott Marsh, Oxenpark Marsh, Honeychurch Strip near Honeychurch

CURRENT ACTION

Management of rivers is complex, with multiple ownership and often with fishing rights in separate ownership.

The South West River Basin Management Plan (2009) has been written by the Environment Agency under the Water Framework Directive (WFD). The plan sets assesses the current status and sets out what will be required to achieve good ecological status. WFD has a strong focus on integrated management at a catchment scale. It identifies actions to improve water quality, enhance river morphology and remove barriers to fish passage.

The management of water availability is addressed in the Catchment Abstraction Management Strategies for Taw and Torridge, prepared by the Environment Agency.

The management of flood risk is set out in the Catchment Flood Management Plan for North Devon (EA, 2009). This recognises the value and benefits of restoring functioning rivers, floodplains and wetlands.

The Taw and Torridge are included in DEFRA's Catchment Sensitive Farming Initiative as 'Associate Catchments'. The aims of the initiative are to raise awareness of diffuse water pollution and encourage early voluntary action by farmers to tackle the problem.

Agri-environment schemes and cross compliance (soil and nutrient management plans) aim to reduce diffuse pollution.

Natural England's Higher Level Stewardship (HLS) is designed to support the management of land in an environmentally sensitive and sustainable way. Theme 1 (South West: Higher Level Stewardship Theme Statement) is to improve the resilience of UK BAP habitats to climate change. This applies to SSSI, CWS or grazing marsh greater than 5 ha.

LINKS TO OTHER BIODIVERSITY ACTION PLANS

	UK BAP	SW BAP	Devon BAP	Exmoor BAP
Habitat Action Plans	Rivers Estuaries Coastal & floodplain grazing marsh Purple moor grass & rush pastures Wet woodland	Rivers and streams Estuaries Coastal & floodplain grazing marsh	Rivers, streams, floodplains & fluvial processes Estuaries Coastal & floodplain grazing marsh Alder and willow wet woodland Rhos pasture	Rivers and Streams
Species Action Plans	Otter European eel Sea / brown trout Atlantic salmon Freshwater pearl mussel Multi-fruited river moss		Otter Atlantic salmon Freshwater pearl mussel	-

OBJECTIVES

- 1 Ensure that the existing extent of natural and semi-natural watercourse or riparian habitat is not lost to development or inappropriate management.
- 2 Maintain and where possible enhance the diversity of habitats associated with streams and rivers and the natural flow patterns (geomorphological processes) which contribute to this diversity.
- 3 Maintain and where possible enhance water availability, water quality as far as climate change permits.
- 4 Protect and where possible increase the populations of BAP priority species associated with streams and rivers, including sustainable populations of Atlantic salmon, sea trout, freshwater pearl mussel and eel.
- 5 Promote the recognition and understanding of the benefits ('ecosystem services') that riparian habitats and floodplains can offer in protecting water quality and reducing flood risk.
- 6 Increase the knowledge and understanding of the functions and values of rivers and streams amongst the various user groups, residents and visitors to North Devon's Biosphere Reserve.

	ACTION	TARGET	LEAD DELIVERER	PARTNERS	Obj. No.
A	Policy and Legislation				
1	Ensure LDF planning policies protect riparian habitats from inappropriate development.	No net loss of natural or semi-natural stream, river or riparian habitat from any type of development.	NDC, TDC	DCC, EA, DEFRA, NE.	1
2	Integrate rivers and streams into Green Infrastructure Plans.	Green Infrastructure Plan completed	NDC, TDC	DCC	1
3	Complete actions set out in SW River Basin Management Plan to achieve good ecological status.	WFD actions completed by 2015.	EA	NE, CSFI, WRT	3
B	Site Safeguard and Management				
1	Promote and instigate sympathetic management programmes in catchments and wetland habitats using agri-environment schemes such as Entry Level and Higher Level Environmental Stewardship.	Uptake of agri-environment schemes maximised.	NE	NDABS, FWAG, CSFI, Landowners and Managers.	2
2	Carry out Catchment Sensitive Farming project	Project carried out by 2015	NE, EA	NDABS	3
3	Enhance stream and river habitat quality through a programme of enhancement schemes.	2 habitat improvement plans implemented by 2015	NE	NDABS, EA, Landowners and Managers.	2

4	Create or restore ecologically and hydrologically functioning streams, rivers and floodplain habitat where this will enhance biodiversity, protect water quality and/or reduce flood risk.	10 ha of habitat restored by 2015	EA, NE		2
5	Develop a strategy to manage the spread of invasive non-native species in priority catchments	Identify priority catchments by 2012. Survey extent of problem species and implement catchment-scale control by 2015.	NDABS		2
C Advisory					
1	Offer advisory service to riparian owners, managers and user groups on management techniques which benefit riparian habitat and associated species.	Advice available to all landowners and managers who request it.	NDABS	NE, NDC, DCC, EA, DWT, FWAG.	5,6
2	Raise awareness of the issues affecting priority species (e.g. freshwater pearl mussel) and the importance of maintaining clean water, undisturbed river sediments and healthy fish.	Fresh water pearl mussel project commenced	NDABS	EA, NE	4

D	Research and Monitoring				
1	Monitor extent and types of riparian habitats, fish populations and invertebrate populations, and support the West Country Rivers Trust's research into genetic fingerprints of salmon.	Monitoring completed to lead organisations timescale and results made available as appropriate	EA, NDABS.	DEFRA, NE, WRT.	4,6
2	Evaluate the potential impacts and benefits of river recreation.	Evaluation completed by 2015.	EA	NDABS, NDC, TDC, User groups	2
E	Communication, Education and Publicity				
1	Work with schools and community groups to raise awareness of the importance of streams, rivers.	2 additional schools by 2011	NDABS	DWT, NE, EA.	6



Rivers and Streams