Scottish Borders Rivers and Burns Habitat Action Plan

Yair Bridge

Definition

Rivers and burns are by nature dynamic systems continually modifying their form and consequently their immediate environment. This Habitat Action Plan therefore covers not only the rivers and burns themselves but also associated features such as shingle beds and sand bars as well as marginal and bankside vegetation.

Extent

Rivers and burns continue to play an important role in shaping the landscape of the Scottish Borders, creating a mosaic of features that support a diverse range of plants and animals. Straddling the English-Scottish Border, stretching for 160km, the River Tweed is the major river of the area. However, a distinctive feature of the Tweed is the number of large tributaries, which make it more a collection of rivers joining a central spine, than a single main channel with small tributaries. These large tributaries include the Teviot, the Whiteadder, the Ettrick, the Jed and the Till which lies almost entirely within Northumberland. To the north-east and separated from the Tweed catchment is the River Eye which drains the eastern side of the Lammermuir Hills. In the south west of the Scottish Borders Region lies the Liddel Water, a tributary of the Border Esk.

Current status

As a whole, the Tweed is classed as a "Lowland Eutrophic" or nutrient rich river and is a rare example of this type. The river shows the full characteristic range of flow patterns from relatively turbulent sections to more sluggish, meandering sections and reaches of alternating deep pools and shallow riffles. This, coupled with a range of water chemistry, offers a wide diversity of river habitats for wildlife.

Under the Habitats Directive, the Tweed and a number of its tributaries have been designated a Special Area of Conservation (SAC) in recognition of their importance for atlantic salmon, brook, river and sea lamprey, otter and water crowfoot (*Ranunculus*) populations. The Tweed system now represents approximately 15% of all the spawning water available to salmon in Scotland with the Ettrick Water being an important spawning area for spring salmon. The Eden in its upper reaches supports a naturally isolated trout population while in its lower reaches it has notable eel and lamprey populations.

As a result of its distinctive water chemistry, the Tweed system is notable for its diversity of invertebrate species. A number of the invertebrate species found in the area are rare both in European and Scottish terms, For example, IUCN (World Conservation

Union) red-0list dipteran fly and beetle populations occur in exposed sediments throughout the catchment and in the upper catchment, the Northhope Burn supports a population of rare aquatic beetles. The distinctive water chemistry of the Tweed system also produces a range of plant communities different from that found in other larger rivers in Eastern Scotland and North eastern England. The area also represents the edge of UK distribution for a number of plants including species of Water Crowfoots and Horned Pond Weed. River Jelly Lichen is a nationally rare lichen that grows in fast flowing upland watercourses and can be found in the Tweed system on the Whiteadder.

Otters have a healthy and expanding population on the lower and middle Tweed and while water voles are known to be present in the Tweed catchment little is yet known of their distribution. For its riverine birdlife, the Tweed system is known for the presence in strong numbers of a good, varied suite of birds rather than a great number of rarities.

Otter Tweed Forum

UKBAP HAP Broad habitat type: Rivers and Streams (http://www.ukbap.org.uk/asp/UKPlans.asp?UKListID=59)

Associated UKBAP priority species: River jelly lichen (Collema dichotomum), reed bunting (Emberiza schoeniculus), otter (Lutra lutra), Pipistrelle bat (Pipistrellus pipistrellus) and water vole (Arvicola terrestris) (http://www.ukbap.org.uk/species.htm)

Borders Species of Conservation Concern found in the Rivers and Burns Habitat

Lichens, mosses & plants

Collema dichotomum, River Jelly Lichen
Peltigera leucophlebia, a lichen
Seligeria carniolica, Water Rock-bristle
Dichodontium flavescens, Yellowish Fork-moss
Fissidens rufulus, Beck Pocket-moss
Hennediella macrophylla, Short Pottia
Schistidium agassizii, Water Grimmia
Orthotrichum sprucei, Spruce's Bristle-moss
Eurhynchium schleicheri, Twist-tip Feather-moss
Trollius europaeus, Globe-Flower
Ranunculus x kelchoensis, Kelso Water-Crowfoot
Sium latifolium, Great Water-Parsnip
Berula erecta, Lesser Water-Parsnip
Scrophularia umbrosa, Green Figwort
Eleocharis austriaca, Northern Spike-Rush

Invertebrates

There is an extensive list of invertebrates including important river and shingle beetles and flies and notable caddis fly and mayfly species, for full list please see website below

Fish

Petromyzon marinus, Sea Lamprey
Lampetra fluviatilis, River Lamprey
Lampetra planeri, Brook Lamprey
Alosa alosa, Allis Shad
Salmo salar, Atlantic Salmon
Salmo trutta, Sea Trout
Thymallus thymallus, Grayling

Birds

Haematopus ostralegus, Oystercatcher
Tringa totanus, Redshank
Alcedo atthis, Kingfisher
Riparia riparia, Sand Martin
Cinclus cinclus, Dipper
Emberiza schoeniclus, Reed Bunting

Mammals

Arvicola terrestris, Water Vole
Lutra lutra, Otter
Myotis daubentonii, Daubenton's bat

Habitat Quality Indicator species

Otter, Atlantic salmon, Sea lamprey, River lamprey, Brook lamprey, Kelso Water-crowfoot, Stream water crowfoot, River-water crowfoot, Common water-crowfoot, Pond water-crowfoot, a hybrid water crowfoot, River shingle beetle and fly communities, Riverine Macro-invertebrates

Flagship species

Dipper, Daubenton's bat and water vole

For a full list of Rivers & Burns Species of Conservation Concern visit http://www.scottishbordersheritage.co.uk/

(List compiled by Scottish Borders Biological Records Centre)

Factors affecting the habitat

Impacts

Pollution

While the Tweed system is generally of high water quality it can still suffer from pollution which can impact on the biodiversity of the rivers and burns. During long, hot dry summers excessive algal growth may occur in the middle and lower sections of the Tweed and result in eutrophication and this has led to pHs of 10.5 and kills of adult salmon and sea trout. This effect may be enhanced by urban and agricultural run off. The designation of a Nitrate Vulnerable Zone in Lothian & Borders in 2002 and the implementation of specific measures from 2003 should help reduce this impact in at least part of the water catchment of the Borders. Chemicals such as synthetic pyrethroids now widely used in arable agriculture and sheep dip are extremely toxic to aquatic fauna and small volumes can have a devastating impact. A legacy of domestic discharge which does not currently meet modern standards also contributes to diffuse pollution.

The Water Framework Directive is aimed at addressing these issues of diffuse pollution i.e. Pollution arising from land use activities (urban and rural) that are dispersed across a catchment, or sub-catchment, and do not arise as a process effluent, municipal sewage effluent, or an effluent discharge from farm buildings

Non native species

A number of non native species such as giant hogweed, Himalayan balsam and Japanese knotweed have self colonised and taken over large areas of river bank throughout the Tweed system, displacing native vegetation and the fauna that it supports. Continued escapes of rainbow trout from fish farms may have, as yet unquantified, impacts on native salmonids. Historically several non-native fish have become established in the Tweed which have changed the native species community. Introductions of Jenkins spire shell, *Crangonyx* shrimps and *Dugesia* sp flatworms have had no apparent impact to date. While mink populations in the area now seem to be passing their explosive peak their impact on the water vole population and other fauna may be long lasting.

Japanese knotweed Tweed Forum

Engineering and drainage operations

The Tweed system like most watercourses has been affected by river engineering works and agricultural drainage. This can result in the loss of individual habitat features such as floodplains and wetlands and create obstacles to the movement of species such as spawning salmon and trout through inappropriate culvert and road crossing construction. The textile industry left a legacy of weirs and caulds that have had significant past impacts on native fish. Over time they have all now been eased through the efforts of the River Tweed Commissioners and the Tweed Foundation. This has led to salmon being recorded in the upper Blackadder water for the first time since records began.

There is one significant stretch of the Tweed system, the Leet Water that has a restricted invertebrate fauna. The main cause of this may have been land drainage in the 1970s which destroyed the physical diversity of the river and its associated wetlands. Water quality may also have been a contributory factor.

The cumulative affect of river engineering and agricultural drainage can also impact on biodiversity as the water retaining capacity of catchments is reduced and the rate at which precipitation reaches the river system is increased.

Ultimately, if we are to successfully manage the watercourses and their associated habitats then it is vital that we develop a clear understanding of the natural dynamics of the river system.
SEPA will be given powers under the Water Environment and Water Services Scotland Act (2003) to control engineering operations in the river that impact on river ecology and geomorphology.

Riverworks Tweed Forum

Bankside management

Heavy all year round grazing of livestock on riverbanks can cause excessive erosion and degradation of bankside vegetation. This increased erosion can result in more gravel and silt entering the river, which clogs up river gravels, reducing their quality as both spawning gravels for fish and as habitat for fast water invertebrates. Degradation of bankside vegetation not only impacts on species such as water voles, otters and a range of invertebrates but also fish as water temperatures are increased as a result of reduced shading from bankside vegetation.

Abstraction

Currently river abstraction is under limited legal control and therefore during long, dry summers, large numbers of irrigation units are able to abstract water from the Tweed system unchecked. This may result in severely depleted flow in smaller channels. Actions implemented under the Water Framework Directive aim to address this.

Threats

Climate Change

Climate change may result in wetter winters and drier summers for the UK, although precise predictions are not currently available. There is a strong likelihood that there will be alterations to the amounts and timing of water availability.

Development Pressure

Housing development pressures are increasing in the Scottish Borders leading to a desire to minimise the space taken up by the river corridor by building on the floodplain. This has implications particularly for the downstream section of Tweed where habitat features such as floodplains, wetlands, meander and oxbow systems will be threatened as a result. Increased flood risk, resulting from floodplain development could in turn lead to hard engineering schemes to protect properties, threatening the biodiversity and geomorphology of the area's rivers and burns. However, Scottish Borders Council's Local Plan takes a precautionary approach to flood plain development, which should help minimise such threats.

Other threats include drainage from new developments although wider adoption of Sustainable Urban Drainage Systems (SUDS) guidelines would help address this.

Non-native species

The introduction of additional non -native species to the Tweed system has the potential to devastate the areas biodiversity. The parasite *Gyrodactylus salaris* has already devastated Salmon populations in Norway and there is a fear that anglers fishing in Norway and the Tweed system may inadvertently introduce the parasite. Other non-native species that threaten the aquatic flora and fauna of the Tweed system include:- the Bullhead (*Cottus gobbio*), the Signal Crayfish which is already established in the upper limits of the River Clyde; Chinese Mitten Crab whose nearest population is in the River Tyne and the Zebra Mussel.

Genetic Integrity

The Tweed supports the full range of salmon life-history types with sub-populations of spring, summer and autumn salmon and summer and autumn grilse. The early running fish (Spring Salmon) are the major sub-population on the Ettrick and the Whiteadder. The genetic integrity of the Tweed's salmon populations could be threatened by genetic pollution through the introduction of non-native salmon. Any future problems arising would be subject to statutory controls

Current Action

Point source pollution is now largely under control on the Tweed system and efforts are now being turned to the management and control of diffuse pollution. Under the Water Framework Directive, the need to control diffuse pollution will be increased and research is currently being carried out into effective means of control. Current measures include the use of Sustainable Urban Drainage Systems (SUDS) guidelines as well as the development of Whole Farm Plans and the use of uncultivated bankside strips called buffer strips. In response to the water quality problems on the Leet Water, a specific programme has been set up, organised by the Leet Management Group, with the aim of improving the rivers overall quality.

It has long been recognised in the area that a partnership approach is vital if the biodiversity of the rivers and burns is to be protected. The Tweed Invasives Project, which began in 2002, is an ambitious new project aimed at the long-term sustainable control of giant hogweed and Japanese knotweed within the Tweed catchment. It aims to achieve this by working in partnership with local farmers, landowners, riparian interest groups and statutory authorities. There is also a long established Riverworks group that aims to ensure all river engineering works are carried out in an integrated and sustainable manner and biodiversity is protected. More recently a Reservoir Release Management group has been set up which aims to ensure that flow regimes downstream of the reservoirs in the area take into consideration ecological as well as water quality requirements.

Scottish Borders Councils Structure Plan and Local Plan provide a framework of general protection from further development to river and burn corridors and the SAC designation of the Tweed and a number of it's tributaries also offers some protection against further and inappropriate development.

To address the issue of bankside erosion and degradation of bankside vegetation, a Riparian Habitat Project has been set up which has already resulted in over 75Kms of the Tweed river system being fenced off from livestock and 30,000 trees being planted in the riparian zone.

RIVER TWEED SPECIAL AREA OF CONSERVATION (SAC)

is an area of land or sea recommended for particular protection under the European Habitats Directive (full title 'Council Directive 92/43/EEC on the conservation of natural habitats of wild flora and fauna') because it supports rare, endangered or vulnerable habitats and species of plants and/or animals (other than birds). By 2004, cSACs will be approved by the EC and be designated SACs. Along with Special Protection Areas (1979 EC Wild Birds Directive) they will be part of Natura 2000 – a network of protected areas across the whole of the Europe Union.

The River Tweed SAC is designated on the basis of Water-crowfoot habitats (Ranunculion fluitantis and Callitricho-Batrachion vegetation) and internationally important populations of atlantic salmon (Salmo salar) sea,(Petromyzon marinus) river (Lampetra planeri) and brook lamprey (Lampetra fluviatilis) and otter (Lutra lutra)

Parts of the River Tweed are also designated as a SSSI on the basis of the above species and habitat as interest, but also because of important invertebrate communities of silt, gravel and shingle.

Middle Tweed at Floors Tweed Forum

The Water Framework Directive, now translated into the Water Environment and Water Services (Scotland) Act 2003 will provide powers regarding water quality and quantity, river alteration and fluvial geomorphology to achieve good ecological and physical status of river catchments.

Bothwell Instream Works Tweed Forum

There is a growing recognition that to protect our water resources and the biodiversity they support we must integrate land and water resources planning.

WATER FRAMEWORK DIRECTIVE (WFD)

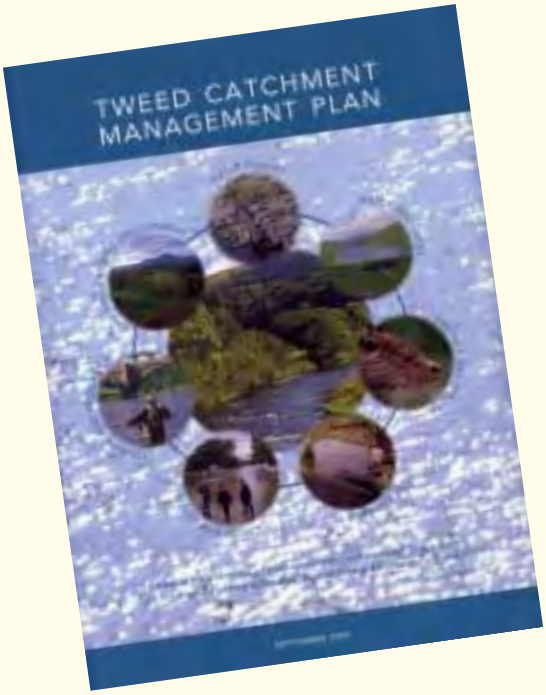
The Water Framework Directive (WFD) is a major piece of European legislation now transposed into Scottish law. It applies to all surface waters (rivers, standing waters, estuaries, coastal to 1NM), ground waters and some wetlands, in EU countries. It will assess water bodies using a number of quality elements (faunal, floral, physicochemical, hydro-morphological) by monitoring and classifying according to typology/ comparison with unimpacted or reference conditions. It will require all surface water bodies to achieve "good ecological status" with the exception of artificial/ heavily modified water bodies which must achieve "maximum ecological potential" and protected/ sensitive areas (eg SACs etc) which must achieve "high status". This will be achieved through an iterative process of identification, risk assessment, monitoring & classification and identification and implementation of sets of measures to achieve these targets. Measures will be implemented through River Basin District Plans. These measures are set out in the directive and include: controls on pollution, abstraction/ impoundment, and on other impacts such as engineering in and around water bodies. Additionally, there is a requirement not to allow deterioration in status in advance of implementation.

Of particular relevance to this plan, it is likely that the River Tweed will be part of a cross-border River Basin District, and because of the various European designations will be required to achieve the highest possible status for a river of its type. It is also important that any actions carried out under this plan or TCMP are compatible with Water Framework Directive objectives & monitoring and do not compromise existing or future WFD status.

Sources: Water Framework Directive – making it work together Scottish Executive leaflet available from: http://www.sepa.org.uk/water/water_publications/water_framework_directive.aspx

The future for Scotland's Waters-guiding principles on the technical requirements of the Water framework directive – SEPA pub (2002) available from link below.

SEPA Website – Water Framework directive guidance http://www.sepa.org.uk/water/water_publications/water_framework_directive.aspx



TWEED CATCHMENT MANAGEMENT PLANNING INITIATIVE

Within any river catchment there is always a great number of interacting and interdependent environmental resources and interests.. The Tweed Catchment Management Planning Initiative is an exciting and innovative project, which has risen to the challenge of developing a genuinely holistic and integrated approach to the management of the Tweed. The Tweed Catchment Management Plan represents a single management framework to deal with the many interacting and interdependent environmental resources of the catchment, co-ordinating the differing administrative systems and multiple demands across the Scottish, English border. The management framework contains stakeholder solutions built on a consensus view, which have been developed using an open, participative approach.

The Plan covers topics such as water quality, water quantity, habitat and species conservation, riverworks, flood management and tourism and recreation and contains a series of actions to address specific issues such as diffuse agricultural pollution, water abstraction, invasive species, reservoir management and flood plain development.

Delivery of the Catchment Management Plan and Water Framework Directive is strongly linked to the LBAP process and the LBAP partnership is working closely with both initiatives to ensure the most effective and efficient approach.

THE FISHERIES MANAGEMENT PLAN FOR THE TWEED AND EYE FISHERIES DISTRICT

This is now in its third five year edition, which will cover the years 2002-2006.

Fisheries management is not actually about managing fish, as fish do not need human help in order to breed or grow and they can cope well with natural problems such as droughts and floods. The difficulties they do have are those caused by humans who dam and abstract their water, pollute it, degrade their habitats in rivers and streams with overgrazing or overshading by dense plantations - and then want to catch them. It is therefore mainly about managing people.

All human activities in catchments impact on fish to a greater or lesser extent, but agriculture, industry, forestry, construction of road crossings and fisheries can all be carried out in ways that either have minimal impacts or even positive benefits to fish instead of doing the often severe damage that they have done in the past. Providing information on best practice to land users in a catchment and promoting and advising on its adoption is therefore a crucial and fundamental part of fisheries management. Healthy fish stocks come from healthy catchments so catchment management is the foundation on which fisheries management rests.

Fish need to be understood in order to judge the state in which stocks are and the impacts and problems affecting them. The most basic knowledge of all is how many breeding stocks or populations there might be within each species of fish. Modern genetics is showing that Salmon in large rivers systems like the Tweed do not exist as single, interbreeding populations filling the whole catchment but as a group of geographically and genetically distinctive stocks with different characteristics, such as the time, Spring, Summer or Autumn, when they return to the river. There has been less research on Trout and other species but there are indications that their stock structure is similar. The ten month Salmon fishing season of the Tweed depends on the preservation of each distinctive stock of Salmon, making their biodiversity of both biological and economic importance to the Borders.

Aim

To conserve, enhance and where appropriate restore the rivers and burns of the Tweed and other catchments found in the Scottish Borders through a process of integrated land and water management.

Objective 1

- Maintain and improve the water quality in rivers and burns in the Scottish Borders to meet Water Framework Directive standards.

  Target: Secure excellent or high water quality (SEPA Water Classification Scheme standards) in rivers and burns in the Scottish Borders by 2010.

  Target: Work towards WFD quality standards and ensure the rivers and burns in the Scottish Borders meet these standards by 2015.

  Target: Ensure SAC meets EU LIFE water quality standards for features of interest

Objective 2

- Establish flow regimes required to maintain and enhance riverine species and habitats in the Scottish Borders

  Target: Assess by 2008 flow regime in SAC against EU LIFE water quantity standards for all features of interest. Where other species of interest are present, flow regime plans should take this into account.

  Target: Ensure flow regime is managed in such a way to ensure "high" status under WFD assessment by 2015

Objective 3

- Protect, maintain and enhance rivers and burn species and habitats including the channel and the riparian zone in the Scottish Borders.

  Target: No net loss of rivers and burns habitat in the Scottish Borders by 2008

  Target: Identify priority areas of river and burn /riparian habitat for habitat enhancement by 2008

  Target: Monitor and control the introduction and establishment of non-native species in the catchments of the Scottish Borders.

  Target: Ensure that there are sufficient data on rivers and burns species and habitats to inform sustainable management practices.

  Target: Ensure the sustainable management and development of the economically valuable fisheries.

Objective 4

- Maintain and restore the physical integrity of rivers and burns in the Scottish Borders.

  Target: Assess geomorphological characteristics against WFD standards by 2008

Objective 5

- Increase education and awareness of rivers and burns and their importance as an asset to the communities of the Borders.

  Target: Establish a public awareness programme focussing on invasives, riverworks and priority species of the rivers and burns of the Scottish Borders by 2008.

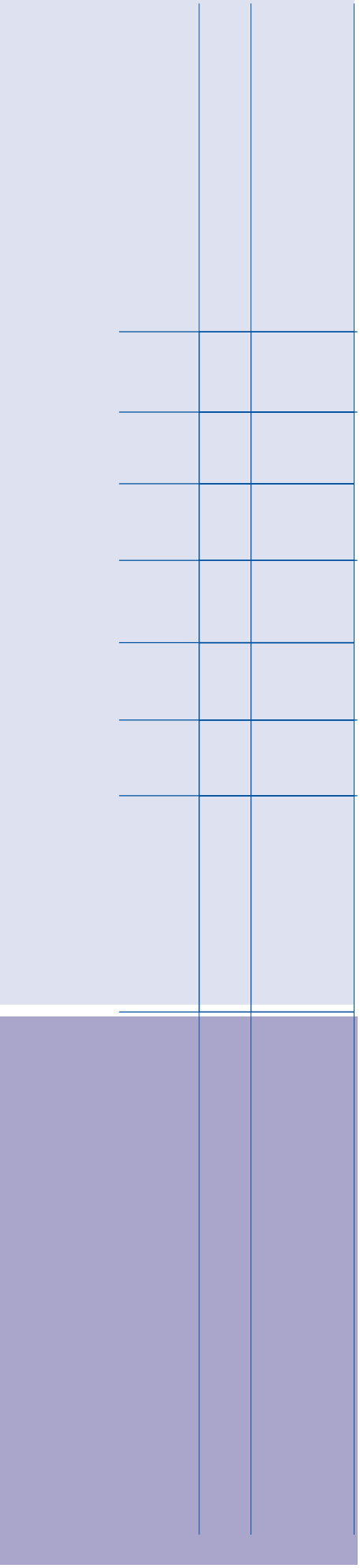
ACTION

1. Policy & Legislation:	Lead and Partners	2004	2005	2006	2007	2008	2013	Meets Objective
Support, promote and implement the Water Framework Directive with regard to the catchments of the Scottish Borders	**SEPA**, SBC SNH, SW TFound Tweed Forum, , SEERAD,	*	*	*	*	*	*	1,2,3,4
Ensure implementation of the Habitats Directive with regard to the Tweed SAC/SSSI	**SNH**, SBC, SEERAD, SEPA	*	*	*	*	*	*	1,2,3,4,
Promote the adoption of SUDS where possible	**SEPA**, SBC SEERAD SW	*	*	*	*	*	*	1,3,5
Adopt & implement policies in the Local Plan to protect flood plain areas from inappropriate development. and protect important areas of rivers and burns habitat.	**SBC** SEPA SNH	*	*	*	*	*		3,4
Adopt & implement policies in the Local Plan to promote soft engineering of rivers, a presumption against further culverting and the promotion of culverted streams.	**SBC** SEPA	*	*	*	*	*	*	3,4
Ensure agri-environment scheme and subsequent Land Management Contracts maintain and enhance riverine habitats	**SEERAD** FWAG SAC	*	*	*	*	*	*	1,3,4
Produce and implement the Tweed Catchment Management Plan	**Tweed Forum**	*	*	*	*	*	*	1,2,3,4,5
Promote, publicise & enforce the Conservation of Native Freshwater Fish Stocks: Prohibition of keeping or release of live fish (Specified species) (Scotland) Order 2003	**SEERAD RTC**	*	*	*	*	*	*	3
Ensure compliance with NVZ legislation	**SEERAD**	*	*	*	*	*	*	1,3

2. Site and Species Safeguard & Management	Lead and Partners	2004	2005	2006	2007	2008	2013	Meets objective
Discourage development or other proposed activities which threaten loss or damage to this habitat, propose alternatives and mitigate potential impacts.	**SBC** SEERAD SEPA SNH	*	*	*	*	*	*	1,2,3,4
Investigate the feasibility of creating floodplain habitats to alleviate flooding risks, allowing the natural functioning of the flood plain	**FAG** SBC, SNH SEPA TForum	*	*					1,2,3,4
Ensure flow regime supports high ecological quality under WFD	**SEPA** SW	*	*	*	*	*	*	1,2,3,4
Develop and implement WFD compliant tools to assess linkage between flow regime and fluvial geomorphology	**SEPA** SNH	*	*	*	*	*	*	2,4
Ensure no damage to qualifying interest of SSSI, SAC	**SNH** SBC SEERAD SEPA	*	*	*	*	*	*	1,2,3,4
Continue with Tweed Invasives Project to control and manage invasive plants in the Tweed Catchment	**TForum**	*	*					3
Ensure continued invasives control by river champions following Tweed Invasives Project	**TForum** LO CG	*	*	*	*	*		3
Ensure that SBC owned riparian areas are subject to management plans to maintain and enhance their biodiversity value.	**SBC**	*	*					3
Continue implementation and development of the Fisheries Management Plan for the Tweed and Eye Fisheries Districts ensuring sustainable fisheries management	**TFound**	*	*	*				3
Encourage sustainable management of riparian habitats in urban areas and encourage community participation in such schemes	SBC, BFT SEPA, SNH TForum, SBC	*	*	*	*	*	*	1,3,5

3. Advisory	**Lead** and Partners	2004	2005	2006	2007	2008	2013	Meets objective
Encourage habitat restoration through the promotion of SEPA's Habitat Enhancement Initiative	**SEPA** TForum SBC	*	*	*	*	*	*	1,3,4, 5
Encourage management of watercourses on farmland through good practice guidance (Farming and Watercourse Management, PEPFAA) and agri-environment schemes	**FWAG** SAC, SEERAD SEPA	*	*	*	*	*	*	1,3,4, 5
Encourage compliance with the Forest and Water Guidelines	**FC**, SNH, SEPA BFT	*	*	*	*	*	*	1,2, 3,4, 5
Promote Tweed Forum Riverworks leaflet and CD	**TForum** Riverworks Group	*	*	*	*	*	*	1,3,4, 5
Produce and promote advisory materials and host an event to highlight the threats posed by non-native species	**TForum** TFound	*	*					3,5
Advise on the implementation of the Habitats Directive with regard to River Tweed SAC	**SNH**	*	*	*	*	*	*	3,5
Ensure appropriate biodiversity enhancement advice is given to Council services	SBC, SNH	*	*	*	*	*	*	3,5
4. Research & Monitoring	**Lead** and Partners	**2004**	**2005**	**2006**	**2007**	**2008**	**2013**	**Meets objective**
Review data on priority species e.g water voles and assess need for to commission further survey and monitoring work.	SNH, LBAP Wetland HWG SBBRC	*	*	*	*	*	*	3,5
Coordinate proposed otter surveys to ensure a catchment wide approach	**SNH**, NWT	*						3,5
Determine by 2004 the requirement for further River Habitat Surveys across the catchments of the Scottish Borders and implement further surveys where appropriate	**SEPA**, SNH LBAP Wetland,HWG	*	*	*	*	*	*	3,4,5
Co-ordinate the collation of species and habitat data on riverine and riparian habitats and encourage local recorder network to feed into this	**SBBRC**	*	*	*	*	*	*	3,5

Develop and implement a planning tool based on FC's FHN project to guide the creation and enhancement of native woodland, and riparian habitats which form part of a strategic network, linking woodlands to other semi natural habitats on a catchment	TForum BFT, LBAP Wetland HWG	*	*	*				3
Identify, survey and map the extent of non-native riverine and riparian species that pose a threat to Scottish Borders catchments	TForum TFound SBBRC	*	*	*				3,5
Investigate flow regimes required to protect and enhance riverine species and habitats.	**SEPA**, SNH T Found	*	*	*	*	*	*	2,3,4
Develop reservoir release regimes to minimize ecological impacts and reflect more natural hydrological conditions.	SEPA, SNH SW	*	*	*	*	*	*	2,3,4
Continue monitoring and research programmes for salmon, brown trout, sea trout and other local fish species under the Fisheries Management Plan for the Tweed and Eye Fisheries District.	**TFound**	*	*	*				3
Conduct Site Condition Monitoring of SSSI, SAC	**SNH**	*	*	*	*	*		3,5
5. Communications & Publicity	**Lead** and Partners	**2004**	**2005**	**2006**	**2007**	**2008**	**2013**	**Meets objective**
Develop a register of designated riverine, riparian and wetland sites including information on reasons for designation, potential threats and relevance to local and national biodiversity.	**TForum** SNH	*						3,5
Host an event promoting the natural heritage interest of riverine, riparian and wetland species and habitats.	TForum,LBAP Wetland HWG		*					3,5
Raise awareness of important riverine & riparian sites with appropriate interpretation and guided walks for the public and schools	BTB,SBC, SBBRC,SNH TForum, T Found	*	*	*	*	*	*	3,5
Continue to highlight the threats posed by invasive plants through the Tweed Invasives project	**TForum** SNH	*	*	*	*	*	*	3,5
Host an event to promote best practice Riverworks.	**TFound**	*	*	*	*	*	*	3,5



Information sources for Rivers & Streams LBAP HAP

1. SUDS

Sustainable Urban Drainage Systems- a design manual for Scotland and Northern Ireland SUDSWP/CIRIA Ciria report C521
ISBN 0 86017 521 9

2. NVZ's

Protection of Scotland's Water Resources- Consultation on further Scottish Nitrate vulnerable Zones SEERAD Paper No 2002/1

3. RIVER HABITAT/ ENGINEERING/MANAGEMENT BEST PRACTICE ETC (SEPA guides)

Watercourses in the community *- a guide to sustainable watercourse management in the urban environment.*

Habitat Enhancement Initiative *- A5 leaflet*

Habitat Enhancement Initiative *- Demonstration sites & award scheme - A5 leaflet*

Habitat Enhancement Initiative *- Enhancing sustainable urban drainage systems (SUDS) for wildlife - A5 leaflet*

OTHER PUBLICATIONS:

Managing river habitats for fisheries*. (produced on behalf of SEPA, SNH, SE and Fisheries Research Services)*

Manual of river restoration techniques - edition 1*. The River Restoration Centre. (second edition imminent)*

Farming and watercourse management *- a good practice handbook. A collaborative publication between WWF (Wild rivers project), SNH, SEPA, FWAG and SAC*

Alterations to rivers and river banks in the Tweed catchment *- Tweed Forum leaflet. Revised leaflet soon to be produced. Partners involved EA, SEPA, Tweed Foundation, SBC, SNH.*

4. DIFFUSE POPULATION

D'arcy B. J., et al (Eds). **Diffuse pollution impacts: The Environmental and Economic impacts of Diffuse Pollution in the UK.** IWA/CIWEM pub.

5. WATER FRAME WORK DIRECTIVE

Water Framework Directive – making it work together Scottish Executive leaflet available from: http://www.sepa.org.uk/water/water_publications/water_framework_directive.aspx

The future for Scotland's Waters-guiding principles on the technical requirements of the Water framework directive *– SEPA pub (2002) available from link below.*

SEPA Website – Water Framework directive guidance http://www.sepa.org.uk/water/water_publications/water_framework_directive.aspx