



**TWEED CATCHMENT  
MANAGEMENT PLAN  
2015 - 2021**



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# Executive Summary

The Tweed Catchment Management Plan (CMP) is a single management framework for the many interacting and interdependent ecosystem services provided by the waters and wetlands of the Tweed catchment. It offers a method for the integration of different administrative, planning and regulatory systems in order to sustainably manage the multiple demands on the catchment for the benefit of all. Ultimately, the CMP ensures that we are addressing the key issues, in the right place and at the right scale, to bring about long lasting benefits on multiple strategic fronts.

Recognising the links between the health of our rivers and land use, the CMP aims to enable all those with an interest in the river to communicate, liaise and work more effectively together. It provides the framework and context to enable a wide range of interests to determine their role in safeguarding the vital ecosystem services that the waters and wetland habitats of the Tweed provide. It should be used to guide and develop the future work programmes of all those involved with the catchment's management and development, and is crucial in obtaining funding to deliver specific actions outlined in the management framework.

Developed through extensive consultation and public participation, the Tweed CMP is only part of the wider work of the Tweed Forum, setting out a management

framework to help achieve the aims and goals of the Forum membership.

## AIMS AND GOALS OF THE TWEED FORUM

**Conserve, enhance and, where appropriate, restore the total river environment through effective land and resources planning across the Tweed catchment.**

**In achieving this Tweed Forum will:**

- Enable actions on the ground, which benefit both the water environment and its users
- Engage a wide range of parties from government organisations to local communities, interest groups and landowners
- Harmonise land and water uses within the catchment to an agreed set of common objectives

The management framework of the CMP begins with seven strategic aims addressing key issues surrounding water quality, water quantity, habitats and species, riverworks, flood management, tourism and recreation and, finally, delivery and development of the CMP. Each of the seven strategic aims sets out a broad aspirational statement for a given management area over the next six years, synchronising delivery of the CMP with the six-yearly WFD river

basin planning process and the Floods Directive planning cycle. The strategic aims will also help deliver other legislation throughout the catchment, such as the Habitats Directive, the Nitrates Directive as well as climate change agendas, including the Scottish Land Use Strategy. Whilst, for ease of presentation, the strategic aims are presented separately, it is vital that they are not viewed in isolation as they are often inextricably linked.

Arising from these strategic aims, the framework then presents a set of specific targets and actions in a series of action tables. Key organisations are identified as contributing towards a given action in partnership with other vital parties such as farmers, landowners and community interests. Implementation of the CMP is overseen by the Tweed Forum Steering Group and is facilitated and coordinated by Forum staff and specialist working groups formed from the Forum membership. As part of the ongoing review process, progress towards actions is monitored, priorities for action re-examined, additional actions and targets included where appropriate and key funding requirements identified.

Since the launch of the CMP in 2003, a large amount has been achieved across a wide spectrum and Tweed Forum has demonstrated the value of the partnership approach in achieving common goals and multiple benefits (see i.vii for more details

of CMP reviews, conducted in 2005, 2009 and 2015). Synergy with the requirements of the WFD and Floods Directive has been fundamental during these reviews. The CMP is instrumental in helping deliver the objectives of the Solway Tweed River Basin Management Plan (RBMP), however, with the CMP taking a truly holistic view and incorporating key issues such as recreation, access and flood defence which lie largely outwith the scope of the RBMP, the CMP ensures delivery of multiple benefits wherever possible. Shifts in land use management policy, delivery of the Floods Directive, the impact of climate change on all areas of work and the move towards an Ecosystem Approach, will all influence management of the Tweed catchment in both the short and the long term.

**For more information on the CMP and the work of Tweed Forum, please contact:**



**Tweed Forum,  
South Court, Drygrange,  
Melrose,  
Roxburghshire  
TD6 9DJ**



**01896 849723**



**info@tweedforum.org**



**www.tweedforum.org**

STRATEGIC AIM 1

**WATER QUALITY**

Maintain and enhance the water quality of the Tweed Catchment

STRATEGIC AIM 2

**WATER RESOURCES**

Ensure that water levels and flow are managed to meet the needs of the natural environment and the need for abstraction

STRATEGIC AIM 3

**HABITATS & SPECIES**

Maintain and enhance the status and distribution of riverine, riparian and wetland species, and habitats of conservation interest

STRATEGIC AIM 4

**RIVERWORKS**

Restore modified/impacted channels and ensure all riverwork operations respect the physical, ecological and aesthetic integrity of the river system

STRATEGIC AIM 5

**FLOOD MANAGEMENT**

Adopt a catchment-based approach to flood management which helps protect the people, property and prosperity of the Tweed catchment whilst respecting its physical, ecological and aesthetic qualities

STRATEGIC AIM 6

**TOURISM & RECREATION**

Promote the sustainable development of river-related tourism and recreation and protect cultural heritage and landscapes

STRATEGIC AIM 7

**CMP DELIVERY & DEVELOPMENT**

Ensure the delivery and development of the Tweed Catchment Management Plan

# Strategic Aims

CURRENT STATUS	KEY AREAS	KEY POLICY & PROCESS
<b>WATER QUALITY - MAINTAIN AND ENHANCE THE WATER QUALITY OF THE TWEED CATCHMENT</b>		
<p>50% of the rivers in the Tweed catchment achieve good to excellent water quality. There are a number of localised areas of nutrient enrichment resulting in degraded water quality and pollution.</p>	<ul style="list-style-type: none"> <li>● Diffuse agricultural pollution</li> <li>● Impact of industrial and residential development</li> <li>● Failure to meet WFD good ecological status targets</li> <li>● Impact of septic tanks</li> </ul>	<p>WFD SEPA Priority Catchment and Focus Areas Nitrates Directive Urban Waste Water Directive Habitats Directive CAR CSF LUS</p>
<b>WATER QUANTITY - ENSURE THAT WATER LEVELS AND FLOW ARE MANAGED TO MEET THE NEEDS OF THE NATURAL ENVIRONMENT AND THE NEED FOR ABSTRACTION</b>		
<p>The Tweed catchment is key for meeting public water-supply demands in the Borders and Edinburgh, both agriculture and industry and is a vital component of many habitats which support a rich diversity of species.</p>	<ul style="list-style-type: none"> <li>● Ensuring efficient use of water</li> <li>● Ecological impact of reservoir release regimes</li> </ul>	<p>WFD Habitats Directive CAMS CAR LUS</p>
<b>HABITATS &amp; SPECIES - MAINTAIN AND ENHANCE THE STATUS AND DISTRIBUTION OF RIVERINE, RIPARIAN AND WETLAND SPECIES, AND HABITATS OF CONSERVATION INTEREST</b>		
<p>Great diversity of riverine, wetland and riparian habitats and species, many of which are recognised through local, national and international conservation designations.</p>	<ul style="list-style-type: none"> <li>● Insufficient baseline data</li> <li>● Loss of key habitats such as wetlands, blanket bog, raised bogs, wet woodlands, riparian woodlands and ponds</li> <li>● Non-native invasive species</li> </ul>	<p>Habitats Directive Birds Directive WFD LBAPs Tweed INNS subgroup LUS Scottish Biodiversity Strategy</p>

CURRENT STATUS	KEY AREAS	KEY POLICY & PROCESS
<p><b>RIVERWORKS</b> - RESTORE MODIFIED/IMPACTED CHANNELS AND ENSURE ALL RIVERWORK OPERATIONS RESPECT THE PHYSICAL, ECOLOGICAL AND AESTHETIC INTEGRITY OF THE RIVER SYSTEM</p>		
<p>Channel modification carried out throughout history, historically to provide water power for the textile industry and, more recently, to tackle river management issues such as bank erosion, gravel management, flood alleviation, bridge protection and instream habitat improvements.</p>	<ul style="list-style-type: none"> <li>● Lack of understanding of the river system and its response to riverworks</li> <li>● Lack of coordinated advice and guidance for those considering riverworks</li> <li>● Ensuring streamlined and efficient regulation</li> <li>● Restoring modified channels</li> </ul>	<p>WFD Habitats Directive Tweed Forum Riverworks group CAR</p>
<p><b>FLOOD MANAGEMENT</b> - ADOPT A CATCHMENT-BASED APPROACH TO FLOOD MANAGEMENT WHICH HELPS PROTECT THE PEOPLE, PROPERTY AND PROSPERITY OF THE TWEED CATCHMENT WHILST RESPECTING ITS PHYSICAL, ECOLOGICAL AND AESTHETIC QUALITIES OF THE NATURAL ENVIRONMENT AND THE NEED FOR ABSTRACTION</p>		
<p>The catchment has a long history of flooding with recent severe floods occurring in 1948, 1977, 1984, 2008, 2009 and 2015. Currently 9% of the catchment's properties are considered at risk from flooding, mostly from riverine as opposed to coastal flooding.</p>	<ul style="list-style-type: none"> <li>● Development on the floodplain</li> <li>● Implementing Natural Flood Management</li> <li>● Implementing Flood Risk Management Plans</li> <li>● Potential impact of new developments and land use change on frequency and intensity of flood events</li> </ul>	<p>Floods Directive <i>(Flood Risk Management Plans/Strategies, PVAs/Flood Risk Areas, NFM zoning)</i> WFD Local planning laws Natural Flood Management LUS</p>
<p><b>TOURISM &amp; RECREATION</b> - PROMOTE THE SUSTAINABLE DEVELOPMENT OF RIVER-RELATED TOURISM AND RECREATION AND PROTECT CULTURAL HERITAGE AND LANDSCAPES</p>		
<p>Attracting international, national and local visitors, the Tweed catchment is particularly well endowed with outdoor recreational opportunities, which include fishing, walking, cycling, canoeing as well as a wealth of heritage sites.</p>	<ul style="list-style-type: none"> <li>● Potential conflict between conserving and enhancing the Tweed catchment and increasing tourism and recreational facilities in the area</li> <li>● Potential conflict between river users</li> <li>● Unrealised potential for tourism and recreational activities, based in and around rivers of the catchment, to contribute to the local economy</li> </ul>	<p>Land Reform (Scotland) Act CRoW Act Tourism strategies</p>

CURRENT STATUS	KEY AREAS	KEY POLICY & PROCESS
<p><b>CMP DELIVERY &amp; DEVELOPMENT</b> ENSURE THE DELIVERY AND DEVELOPMENT OF THE TWEED CATCHMENT MANAGEMENT PLAN</p>		
<p>The CMP identifies the goals and aspirations of the wider stakeholdership but stakeholders need to work together as individuals and organisations and, crucially, commit adequate time and resources.</p>	<ul style="list-style-type: none"> <li>● Stakeholder fatigue</li> <li>● Will adequate resources be available for delivery of the CMP?</li> </ul>	<p>Tweed Forum WFD and river basin planning LUS</p>
<p><b>CROSS-CUTTING THEMES</b></p>		
<p>Climate change</p>	<ul style="list-style-type: none"> <li>● Impact of climate change on the freshwater environment</li> <li>● Public confidence in climate change predictions</li> </ul>	<p>Climate Change Act Local Climate Impact Profile UK Climate Impacts Programme UK Climate Projections</p>
<p>Ecosystem Approach to land use planning</p>	<ul style="list-style-type: none"> <li>● Raising public awareness of 'ecosystem services' and the 'Ecosystem Approach'</li> <li>● How the Ecosystem Approach can be meaningfully applied in the Tweed catchment</li> <li>● Better decision-making on land and water management planning</li> <li>● Achievement of multiple benefits and more balanced provision of ecosystem services.</li> </ul>	<p>Millennium Ecosystem Assessment UK National Ecosystem Assessment LUS</p>
<p>Planning and Development</p>	<ul style="list-style-type: none"> <li>● Impact of inappropriate planning and development legislation/policy on freshwaters</li> </ul>	<p>UK planning laws</p>

# Foreword

The Tweed is a river of international renown and throughout history its special qualities have inspired verse and literature. Straddling the border between Scotland and England, the river has served as a focus for the economic, cultural and landscape development of the area from the rivulets high in the hills, down to the broad expanses of the estuary. Today, Tweed is a major economic and environmental resource, playing a vital role in the landscape, tourism, wildlife, water supply, drainage and recreation of the area. It harbours a rich variety of flora and fauna, is an internationally famous salmon river and a rich agricultural area, attracting thousands of visitors each year and providing drinking water for the Borders and Edinburgh. In managing a resource with so many interacting and interdependent issues, it is essential to include all those activities associated with the river and ensure that all interested parties are given the opportunity to become involved. This has been the foundation for the Tweed Forum since its inception and underpins the development and delivery of the Tweed Catchment Management Plan (CMP).

It is now 12 years since the first edition of the CMP was published and a huge amount has been achieved by the Forum partners. In addition the political landscape has changed very rapidly with the arrival of the Water Framework Directive, the Flood Risk Management (Scotland) Act, the Climate Change Act and the Scottish Biodiversity 2020 Route Map. Thus a thorough review and update of the CMP was timely and this revised edition updates all the actions and targets, whilst accommodating new policy

frameworks such as the Solway Tweed River Basin Management planning process and growing issues such as climate change and development pressures.

The CMP has shown itself to be a very dynamic document and this is testament to the amount that is being achieved by the CMP partnership in progressing the targets and actions laid out within the document. Tweed Forum has shown what can be achieved at the catchment scale by working in partnership to address common issues that achieve multiple strategic objectives. The Tweed Forum philosophy and function has never been more relevant and this is borne out by the fact that it has been recognised by the UNESCO HELP programme as an exemplar of best practice in catchment management in addition to winning the inaugural UK River Prize.

However, Tweed Forum is nothing without an active membership. Servicing such an ambitious document as the CMP is hard work and we would like to thank all those who have contributed to keeping the Plan up to date and fit for purpose.

Our track record over the last twelve years has shown the giant strides we have made in managing such a key resource and the central role we have to play in the years to come.



**James Hepburne Scott,**  
FICFor Hon

# Introduction

## **i.i Background**

The special qualities of Tweed have long been celebrated in literature with few rivers being more lauded. Over the years, writers such as Sir Walter Scott, James Hogg and William Wordsworth have been inspired by its richness of natural beauty and enchanting scenery. For Scott, 'no music sounded so sweetly as Tweed gurgling over its stony bed'.

Today, Tweed is subject to increasing pressures and demands from a wide range of activities such as agriculture, tourism, recreation and development. All of these need to be managed if the special qualities and unique character of the area are to be secured and ecosystem services sustained. Tweed provides a myriad of ecosystem services from drinking water to agricultural irrigation; from a world famous fishery to the natural filtration functions of wetlands. While there are already a number of organisations concerned with river management or the many activities that may affect the river environment, each has its own remit and, in a cross-border catchment such as the Tweed, many work under different legislative arrangements. In addition, many issues will only be successfully addressed by engaging the wider community, with farmers and landowners having a vital role to play.

In May 2001, members of Tweed Forum recognised the need for a single management framework to deal with the many interacting and interdependent environmental resources of the catchment. In addition, there were few opportunities for vital parties such as landowners, farmers and local communities to become

involved in the catchment's management. It was therefore decided to consolidate the partnerships already at work in the catchment and develop a truly integrated framework that enabled all aspects pertaining to Tweed to be considered in a holistic context by the wider community.

## **i.ii Catchment management planning for Tweed**

A catchment is defined as the geographical drainage area of a river and its tributaries. Although the importance of the catchment as a management unit for water resources is now well recognised, catchment boundaries rarely match administrative boundaries. As a cross-border catchment, Tweed comes under a number of different administrative and regulatory systems. The majority of the catchment lies in Scotland and, from a catchment management perspective, is principally administered by Scottish Borders Council, the Scottish Environment Protection Agency (SEPA) and Scottish Natural Heritage (SNH). Across the border, Northumberland County Council, the Northumberland National Park Authority, Natural England and the Environment Agency (EA) have administrative responsibilities. There are also two water authorities operating within the catchment: Scottish Water and Northumbrian Water.

Catchment management planning offers a system for integrating different administrative, planning and regulatory systems as well as the multiple demands made upon a river catchment. It recognises the clear link between the health of our rivers and how we manage land use and enables all those with an interest in the

river to communicate, liaise and work more effectively together. It promotes greater understanding between parties and allows them to work towards shared objectives and sustainably achieve improved environmental quality. Indeed, the process of catchment management planning has become so valued that it is a vital component of the European Union Water Framework Directive (WFD) and Floods Directive, the chief legislations governing sustainable management of the water environment in the UK. An important development in the Tweed Catchment Management Plan (CMP) has been integration with the river basin management plans required under the WFD, particularly the objectives set out in the Solway Tweed river basin plan (*see i.vii for more detail*).

It should be noted that the CMP is only part of the wider work of the Tweed Forum in that it represents a management framework to deliver the aims of the Tweed Forum and its members (see Box 1). The CMP provides the framework and context to enable a wide range of interests to determine their role in securing the future of the Tweed. It has been, and will continue to be, used to guide and develop the future work programmes of all those involved with the river's management and has also helped in obtaining funding to deliver specific actions outlined in the management framework. Only through the CMP's continued development and implementation will we continue to move towards the goals of the Tweed Forum, set out below.

## **BOX 1** AIMS AND GOALS OF THE TWEED FORUM

**Conserve, enhance and, where appropriate, restore the total river environment through effective land and resources planning across the Tweed catchment.**

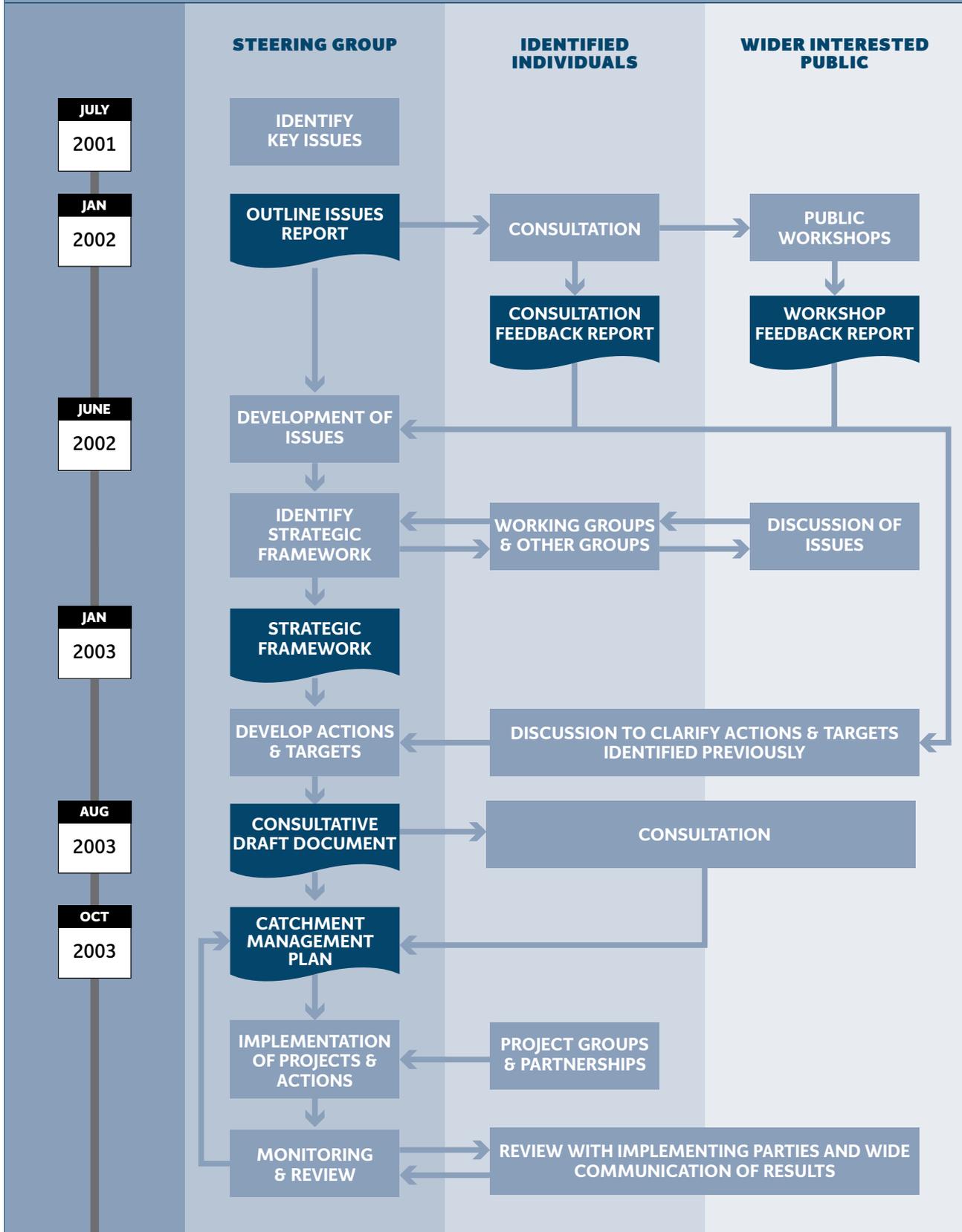
**In achieving this Tweed Forum will:**

- Enable actions on the ground, which benefit both the water environment and its users
- Engage a wide range of parties from government organisations to local communities, interest groups and landowners
- Harmonise land and water uses within the catchment to an agreed set of common objectives

### **i.iii Development of the Catchment Management Plan**

The CMP's management framework was originally developed in 2002, in partnership with a wide variety of Tweed catchment stakeholders working together to jointly define key issues and solutions. The initial process of developing the CMP is presented in Figure 1. Since the launch of the CMP in 2003 there have been two further consultative reviews of the framework, in 2005 and 2009. During these reviews, the Tweed Forum membership were asked to scrutinise the framework on behalf of their organisation, with any requested edits circulated to the entire membership for joint approval/discussion. Following this, a revised edition of the CMP was published in 2010 and 2016 respectively.

**Figure 1** The development of the CMP (Hartley 2003)



**i.iv Scope and structure of the Catchment Management Plan**

The Tweed CMP covers the entire 5,000km<sup>2</sup> of the cross-border Tweed catchment and includes the adjacent 120km<sup>2</sup> Eye catchment to the north-east (see Figure 2). Looking beyond the confines of the river channel, the CMP is concerned with those land management practices that have the potential to impact on the overall quality and quantity of the Tweed’s water environment including riverine habitats and species, wetlands and riparian areas.

The CMP sets out non-statutory management proposals for the Tweed catchment under a series of seven strategic

aims covering water quality, water quantity, habitats and species, riverworks, flood management, tourism and recreation and CMP delivery and development. While they are presented separately within this document, it is vital that none of the strategic aims are viewed in isolation. For example, activities to improve water quality will clearly have positive implications for the habitats and species of the catchment, while riverworks issues are inextricably linked to fisheries management. How well all those involved recognise and appreciate these links is key to Tweed Forum’s success in delivering the CMP.

**Figure 2 Geographical extent of the Tweed Catchment Management Plan**



**Figure 3 Structure of the CMP Management Framework**

The CMP management framework comprises a cascading suite of strategic aims, objectives, targets and actions (see Figure 3) which will be reviewed after a six year period. The seven strategic aims are high level, broad, aspirational statements. Any catchment management decisions and actions taken within this time should be in agreement with these aims.

For each of the strategic aims there are a number of objectives, which broadly indicate how the aims of the CMP will be pursued. Although set in the context of current policy, they are flexible within the wider aims of the Plan and will be responsive to new information and changes in economic, political and physical pressures. Key issues and opportunities are described under each of the objectives. Directly underlying the objectives, the targets and actions of the CMP represent achievable steps towards those aspirations already set out in the strategic aims and objectives. They are reviewed at appropriate intervals and progress monitored (see i.vi).

For each action, we have been able to identify and, through consultation, agree key organisations who will be involved in

taking it forward in partnership with other vital parties such as farmers, landowners and community interests. Timescales are also given for specific actions where possible, although it is recognised that some actions require ongoing commitment while others will be heavily dependent upon political and economic circumstances.

#### **i.v Plan implementation**

Following the launch of the CMP in 2003, the CMP has come to represent the core business of the Tweed Forum. Tweed Forum is managed by a Steering Group who are responsible for key decision making and thus responsible for overseeing the CMP's implementation together with technical sub groups e.g. the 'Riverworks Group'. Implementation has also been coordinated and facilitated by a dedicated project officer since the Plan was launched. Some of the actions contained within the CMP have proved relatively quick and simple to take forward whereas others have proven more complex. For example, actions to collate information on wetlands have been steadily addressed since 2003, with the ultimate aim of informing future wetland restoration/

creation, however it was only in 2010 that a comprehensive wetland strategy for the Tweed was published, drawing together all of this work. Some of the CMP actions may form part of the statutory responsibility of one organisation whilst others may require the partnership approach with a variety of interests coming together to achieve the most effective and efficient solution. The Tweed Forum plays an important role in coordinating and facilitating this partnership working and a key part of the CMP process will be the completion of work programmes that summarise priority targets and actions (Figure 4).

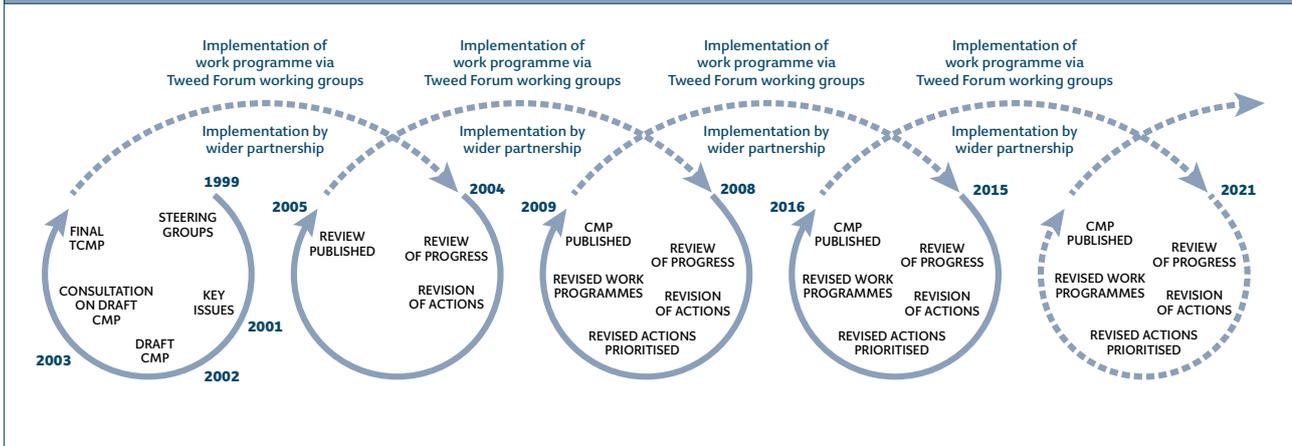
### i.vi Monitoring and review

Ongoing monitoring and review of the CMP is vital to its ongoing success (see Figure 5). The majority of the actions presented here cannot be set in stone. As some actions and targets are achieved, others will be changing, requiring a truly responsive and dynamic process. Under the management of the Steering Group, Tweed Forum has carried out reviews at appropriate timescales and ensured that all partners and participants concerned with implementation activities have been involved.

**Figure 4 Example work programme for Tweed Forum working group**

<b>Water Quality (Strategic Aim 1)</b>							
<b>Target 1.1.1 Reduce the impact of diffuse agricultural pollution on the surface and ground water quality of the Tweed Catchment</b>							
Target/Action	Priority	Timescale	Information Need	Advice Awareness Training	Policy	Project	Key Indicators
1.1.1.1 Address those agricultural sectors that contribute most to diffuse agricultural pollution with targeted and coordinated action.	High	ongoing		●		●	Number of farm visits
							Number of enhancement projects initiated
							Liaison with SEPA Diffuse Pollution Group
							Participate in agricultural seminars/discussions
1.1.1.2 Continue to implement improved farm waste management through nutrient budgeting and other waste minimisation and efficiency measures, where possible.	High	ongoing		●		●	Collaborative Action Co-ordinator report
							Catchment Sensitive Farming report
1.1.1.4 Increase awareness and promote action amongst farmers of practical ways to reduce diffuse pollution, highlighting the potential economic savings that can be made.	High	ongoing		●			Collaborative Action Co-ordinator report
							Catchment Sensitive Farming report
1.1.1.6 Increase awareness of both statutory and non-statutory diffuse pollution codes of practice.	High	ongoing		●			Number of TForum awareness raising activities
1.1.1.3 Promote the use of Constructed Farm Wetland systems.	Medium	ongoing			●	●	Number of new networking/funding opportunities seized
							Number of new CFW systems constructed
							Attendance at Constructed Wetlands Research Group meetings

**Figure 5 The iterative nature of the Tweed CMP**

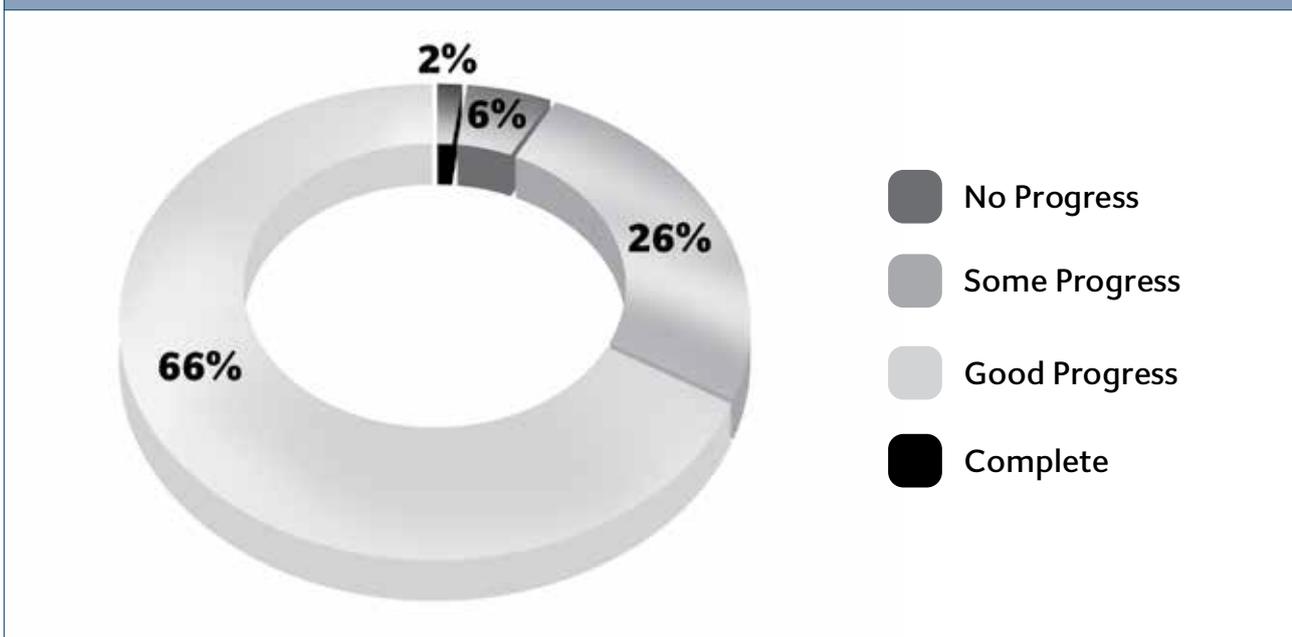


As part of the review process, progress towards targets/actions is monitored, priorities for action re-examined, additional actions and targets included where appropriate and key funding requirements identified. CMP 'Review of Progress' documents have been published and distributed to all CMP partners, relevant organisations and local communities and are also available online. Figure 6 shows overall progress, from 2010 to 2015, towards achieving the CMP actions.

**i.vii Links with relevant legislation, plans and guidance**

The implementation of the European Water Framework Directive (WFD) has been the single most influential process since the launch of the CMP in 2003. The WFD requires member states to implement sustainable water resource management at the 'river basin' (or catchment) scale with the aim of integrating land use and water resource management and thus achieving improvements in and protection of water

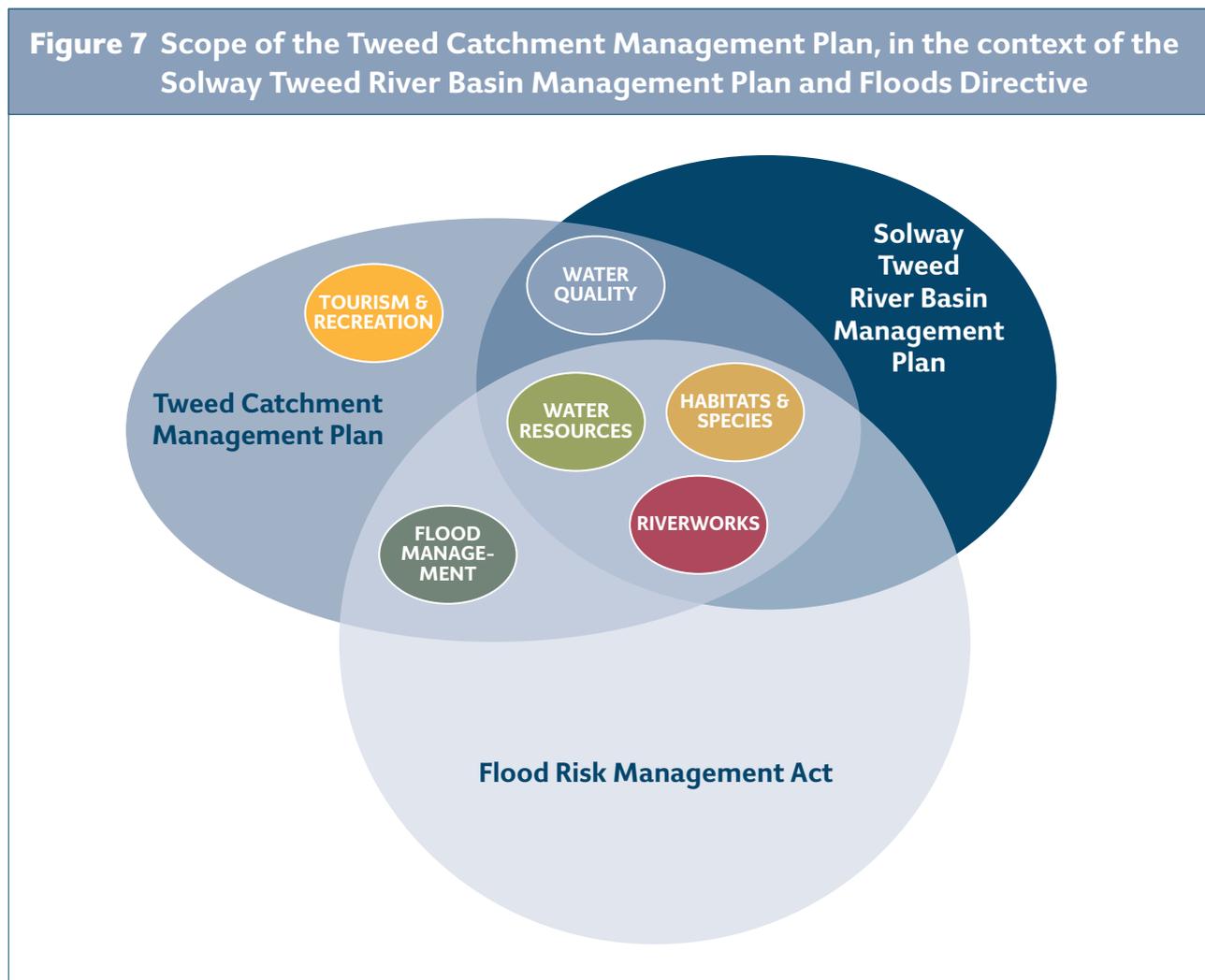
**Figure 6 Progress by CMP partners towards achieving CMP actions (2010-2015)**



quality. The process by which these aims are delivered is termed 'river basin planning' a term that may be considered synonymous, in many ways, with catchment management planning. As the river basin planning process has taken shape, a clear synergy between the river basin planning process and the CMP has become evident. Whilst it is recognised that the CMP goes beyond the remit of the WFD (see Figure 7), a clear desire to integrate the two processes as far as possible was expressed by both the Tweed CMP stakeholders and those engaged in river basin planning. With this in mind, work to synchronise both river basin planning and CMP implementation has been very successful and continues to be refined within the Tweed catchment setting.

Another key European Directive of recent years is the Floods Directive, which requires member states to assess, map and manage flood risk and coordinate these activities at the catchment scale. How the Directive will influence flood management in the cross-border Tweed catchment is still unfolding however it has gone some way to addressing several of the key priorities set out within the Flood Management section of the CMP. Indeed, it is heartening that the issues and solutions identified by Tweed stakeholders and laid out within the CMP action tables are in agreement with this European Directive. Other European legislation relevant to the CMP includes the Nitrates Directive and the Birds and Habitats Directive. In reviewing the CMP, discussions

**Figure 7 Scope of the Tweed Catchment Management Plan, in the context of the Solway Tweed River Basin Management Plan and Floods Directive**



have taken place with SEPA, the EA, SNH, Scottish Borders Council and Natural England to ensure that targets and actions of the CMP help partner organisations meet the requirements of these European Directives more effectively and efficiently.

The CMP also complements and builds upon a number of regional statutory and non-statutory plans, many of which adopt principles from national and international strategies such as the EU Biodiversity Strategy, the UK Biodiversity Framework and the country-level (English and Scottish) Biodiversity Strategies. Many agencies and organisations within the catchment also have their own plans and strategies, which deal with issues such as fisheries, tourism or forestry. Guidance on key issues raised in the CMP, such as sustainable urban drainage, is also issued by a number of organisations and government departments. While it is not possible to list all of the plans, strategies and guidance here they have been considered in the relevant sections of the CMP and, where appropriate, the CMP will contribute to their development and implementation. The CMP also has a key role to play in the integration of relevant plans, to ensure that common goals are delivered using a partnership approach. Figure 8 (*overleaf*) details how the CMP sits within a complex web of legislation, strategic plans and other relevant processes.

### **i.viii Cross-cutting themes**

There are several cross-cutting themes which influence the CMP. These cross-cutting themes, by their very nature, do not sit within a single given area of the CMP and must be woven into each and every element of the CMP and its processes. Chief amongst these themes are adapting

to climate change, the move towards an Ecosystem Approach (including enhanced engagement with stakeholders) and implementation of the Scottish Land Use Strategy.

Notwithstanding the advent of the WFD, climate change and its likely impacts on the freshwater environment may be the single most influential issue for freshwater management in the UK. Certainly, since the last review of the CMP in 2010, the issue of climate change and awareness of the need to build resilience into our environment and communities has taken centre stage. UK climate change predictions (UKCP09) currently suggest that temperatures will increase throughout the seasons with wetter winters and relatively drier summers. It is now universally recognised that building resilience, i.e. taking prior action to prepare habitats, species, farming and land management practices for rapid environmental change and more extreme events, is a key element in reducing the impacts of climate change. The concept of restoring natural systems, and thereby ensuring that they have the capacity to withstand and adapt to climate change, is fundamental and cuts across every element of the CMP.

The Ecosystem Approach is increasingly influencing how we manage the natural environment. It is a systems approach to managing the relationship between people and the natural environment in which they live and work. The three original 'pillars' of sustainability - economic development, social development and environmental protection - are often seen as separate competing interests. The Ecosystem Approach encourages recognition of the interdependence of these goals. Accordingly, the natural environment is the

**Figure 8 Legislation, plans and processes relevant to the CMP**



setting in which economies can grow and local communities can be built.

The Ecosystem Approach is central to the 'Land Use Strategy for Scotland' (LUS) which was published in 2011 with the aim of achieving a more integrated approach to land management; in recognition of the increasing number of pressures and demands placed upon the countryside. Within the Tweed catchment, delivery of the LUS is being explored via the Scottish Borders Land Use Strategy pilot project. The Scottish Borders LUS pilot has produced a map-based tool which helps people make better long-term decisions about land use, at a time of rapid environmental, economic and social change. In taking an Ecosystems Approach, the LUS looks to promote the inclusion of all ecosystem services when considering options for land management to deliver multiple benefits at the catchment scale.

## **i.ix Contact details**

If you have any suggestions, would like to become involved or would like to find out more about the Tweed Catchment Management Plan and its implementation, please contact:



**Tweed Forum,  
South Court, Drygrange,  
Melrose,  
Roxburghshire  
TD6 9DJ**



**01896 849723**



**info@tweedforum.org**



**www.tweedforum.org**

# Management Framework

## Strategic Aim 1

Maintain and enhance the water quality of the Tweed Catchment

### CURRENT STATUS

Good water quality is the foundation for the rich variety of habitats and species within the catchment. Many of our tourism and recreational activities rely on good water quality and it is crucially important for water supply purposes. In this sense, maintaining and enhancing the water quality of the Tweed catchment is inextricably linked to many of the other strategic aims outlined in the CMP and is vital to maintaining the unique and special qualities of Tweed.

SEPA (in Scotland) and the EA (in England) are responsible for monitoring and protecting the water quality of the mainstem River Tweed as well as many of its tributaries.

The European Water Framework Directive (WFD) promotes the assessment of our rivers based on many different indicators of ecosystem health. As a result the aquatic environment is now assessed not just by its chemical composition but also by the river's physical characteristics and the quality of associated flora and fauna. The outcomes of this classification system enable the protection and improvement of water quality and dependent ecosystems and allows us to set and achieve ecological objectives for all surface and groundwaters. Monitoring results show that around 50% of the river water bodies within the Tweed catchment have good or high water quality, with the remainder impacted by various pressures including nutrient enrichment, sediment load, pesticides and other pollutants.

### Objective 1.1

**Locate, investigate and address specific water quality problem areas within the catchment.**

#### ISSUES

Water quality monitoring and ecological assessments carried out by SEPA and the EA throughout the catchment have identified a number of specific areas where water quality is degraded. These include localised areas of nutrient enrichment as well as seasonal water quality problems that can result from long periods of dry weather. While the objectives below and their associated target/actions will go some way to tackling these problems, site-specific action plans addressing a variety of land use practices are also required to improve water quality in these areas.

**Target 1.1.1 – Investigate the causes behind failures to meet WFD/Bathing Water quality targets and draw up and implement action plans to ensure future compliance.**

In order to protect and improve water quality, SEPA and the EA define WFD water quality targets for particular stretches of water. In the Tweed catchment a number of areas have been identified by SEPA and the EA as failing to meet WFD targets and this information will be used to facilitate improvements, utilising key funding sources such as SRDP, the Water Environment Fund and the Countryside Stewardship scheme.

## Objective 1.2

### Monitor, evaluate and address the impact of agriculture and forestry on water quality in the catchment.

#### ISSUES

As a predominantly rural catchment, the water quality status of the Tweed and its tributaries is heavily influenced by rural land management practices such as agricultural and, to a much lesser extent, forestry practices. At present over three quarters of the catchment is in agricultural land use. Arable farming predominates in the lower Tweed valley, while the upper Tweed is dominated by hill sheep and beef farming.

The Tweed catchment was targeted by the Forestry Commission as one of the first areas for large scale conifer planting after the Second World War which, together with tax relief schemes, led to forest cover increasing from 4.6% in 1947 to 17.4% in the early 2000s. This forest cover is currently heavily dominated by non-native species such as Sitka Spruce. Unlike much of the pollution resulting from industrial activities, pollution resulting from agricultural and forestry practices is often diffuse and constitutes a gradual seepage of polluting material from a number of sources into the surrounding environment. This requires changes at the catchment scale to those specific management practices which cause water quality degradation.

#### Target 1.2.1 – Continue to reduce the impact of diffuse agricultural pollution on the surface and groundwater quality of the Tweed catchment.

It is generally accepted that, as in other intensively farmed rural areas, one of the major issues affecting the water quality of the Tweed and its tributaries is diffuse agricultural pollution. Fertiliser and manure application, pesticide use, runoff from farm steadings and soil erosion all have the potential to contribute to diffuse agricultural pollution and degrade water quality. A significant area of the catchment is designated as a Nitrate Vulnerable Zone (NVZ) with levels of nitrates at or beyond the acceptable water quality limits of the EU as a direct result of diffuse agricultural pollution.

Whilst the designation of areas of the Tweed catchment as NVZs is an important step in reducing diffuse agricultural pollution, there is a real need to engage farmers and landowners on a catchment wide basis in practical measures to address diffuse agricultural pollution. The Catchment Sensitive Farming Delivery Initiative, General Binding Rules, the Priority Catchment approach, more vigorous enforcement and the financial incentives under the Scottish Rural Development Programme (SRDP) are beginning to yield results in improving water quality.

#### Target 1.2.2 – Minimise the potential of agrochemicals and sheep dips to degrade water quality.

Both Scotland and England have statutory sheep dipping codes of practice that aim to ensure best environmental practice and safeguard surface and groundwater against pollution from sheep dip activity (Groundwater Regulations 2009 and CAR). Agrochemicals such as pesticides and herbicides can enter the environment through drift, run off, accidental spillage or inappropriate disposal. While comprehensive advice on the use and storage of pesticides and herbicides is available in the PEPFAA code (Scottish Office 2005), pollution incidents still occur in the catchment.

#### Target 1.2.3 – Continue to reduce the potential of forest management activities to adversely affect water quality in the catchment.

Forestry is a vital part of the economy of the Tweed catchment and is increasingly important for both tourism and recreation. However, poor planting practices, fertiliser and herbicide applications, cultivation, drainage and harvesting operations can all have detrimental impacts on the water environment.

Many of these effects can, and have, been alleviated in recent years by modifying existing forestry management practices, as per the Forests and Water Guidelines (2011). Also, national woodland creation strategies now clearly incorporate the latest evidence-based recommendations for designing and implementing new planting schemes in order to minimise the impact of forestry on water quality.

### **Objective 1.3**

#### **Minimise the impact of residential and industrial development on the water quality of the catchment.**

##### **ISSUES**

Historically, the rivers of the Tweed catchment have suffered from both domestic and industrial pollution, particularly as a result of the booming textile industry of the 19th century.

*'Oozing not flowing between its wooded banks, a mere sluggish injection among poisonous pools of scum covered ink. As we ascend, the water of Teviot becomes more and more foul varying.....from black, to a most unwholesome light blue.'*

**John Ruskin's description of the Teviot in the 1850's.**

Great improvements in water quality have been made since the industrial revolution. Discharges of trade or sewage effluent to the majority of watercourses in the Tweed catchment now require consents from either SEPA or the EA and are subject to review. In addition, the Special Area of Conservation (SAC) status of the Tweed means that all consents that have the potential to impact on the SAC must be reviewed and assessed for any likely significant effects on the 'special interest features'.

##### **Target 1.3.1 – Promote and extend the use of sustainable surface water management systems such as Sustainable Urban Drainage Systems (SUDS).**

Sustainable surface water management systems are designed to drain surface waters in a more natural manner using, for example, soakaways, filter drains, detention basins and purpose-built ponds and wetlands. This is a step forward from the traditional approach of draining surface waters as rapidly as possible and allows for a reduction in the rate of flow (alleviating flooding in addition to reductions in water quantity in summer months) and/or the removal of pollutants. Sustainable surface water management systems are now recognised as best practice and are generally required for all new developments.

##### **Target 1.3.2 – Ensure discharges from waste water treatment works and septic tanks do not contribute to the deterioration of water quality.**

Currently, the majority of wastewater treatment plants in the catchment treating both sewage and industrial effluent meet discharge consents set by SEPA and the EA. However, degraded water quality can occur due to insufficient treatment of the discharge, insufficient dilution in the receiving watercourse, lack of maintenance, overloading of the treatment system or a high frequency of storm overflow discharges. The Urban Waste Water Treatment Directive (UWWTD) has a statutory timetable for upgrading sewage treatment works to ensure appropriate treatment. Scottish Water and Northumbrian Water are taking this forward in the catchment in partnership with SEPA and the EA. However, with increasing housing development pressures in the catchment, it is important that wastewater treatment capacities are taken into account when siting new developments and that, in those areas not served by public sewers, sewage treatment systems are properly monitored and maintained. Recent efforts to educate domestic septic tank users have included leaflet mailshots throughout the catchment.

## Strategic Aim 2

Ensure that water levels and flow are managed to meet the needs of the natural environment and the need for abstraction

### CURRENT STATUS

In terms of total flow, the Tweed is one of the largest rivers in the UK, with long-term average flows ranging from 16m<sup>3</sup> per second in the upper Tweed to 65m<sup>3</sup> per second in the lower Tweed (SEPA). SEPA operates 80 rain gauges and 26 river gauging stations in the Scottish part of the catchment, while the Environment Agency has responsibility for water flow and water level monitoring in England.

The Tweed catchment is key to Scottish Water meeting local demands within the Borders as well as Edinburgh. Scottish Water currently has 13 supply reservoirs within the Tweed catchment and a number of bore holes. Major abstractions for public water supply are regulated by SEPA through a series of CAR licences, which control the volumes of water that can be abstracted. Abstractions of surface water and groundwater also take place within the Tweed catchment to support a number of industrial and agricultural activities and these are regulated in Scotland by SEPA (via CAR) and in England by the Environment Agency (via CAMS). The cross-border nature of Tweed requires inter-agency liaison due to the differing legislation and processes in place on either side of the border.

### Objective 2.1

**Consider the needs of the environment alongside those of all other water users.**

#### ISSUES

While it is important that public water-supply demands are met and there is sufficient water to support agricultural and industrial activities, environmental requirements also need to be taken into account when managing and allocating water resources. Habitats and species that depend on the water environment have specific water requirements and we need to ensure that abstraction does not cause river flows, groundwater levels or water levels in wetlands to fall below the minimum level required for the conservation of the aquatic environment. Measuring and monitoring water levels and flows are key to successful water resources management within the catchment.

**Target 2.1.1 – Ensure flows in the rivers and burns of the Tweed catchment meet the requirements of riverine, riparian and wetland species and habitats.**

Predicting how much water can be safely abstracted without impacting on aquatic species and habitats is a difficult task as it requires an understanding of the habitat requirements of a wide range of fish, mammals, insects and plants, many of which have different flow requirements at different life stages. As required by the WFD, work has been completed to identify the flow requirements of specific species and manage freshwaters accordingly. For example, the Life in UK Rivers Project helped to define favourable conservation status for freshwater species and habitats of European importance, including the consideration of flow requirements. At the catchment scale, in the English part of the Tweed catchment, the Environment Agency has done important work on the ecological flow requirement of the Till as part of the subcatchment's CAMS. As more data is collected as a requirement of the WFD, cross-border coordination of hydrological and ecological data must continue.

**Target 2.1.2 – Reduce the impact of surface and groundwater abstractions on riverine, riparian and wetland ecology.**

Reduced river flow resulting from over-abstraction can cause habitat loss, hinder fish migration or reduce the area of riverbed available for spawning or colonisation by aquatic vegetation. Both CAMS (England) and CAR (Scotland) hold increasingly detailed information on the location and volumes of water being abstracted.

**Target 2.1.3 – Continue to review reservoir release regimes to minimise ecological impacts and ensure more natural hydrological conditions.**

The reservoirs of the Tweed catchment have a major impact on the flow regime of downstream rivers, with larger reservoirs such as Fruid, Talla, Whiteadder and Megget being used to augment low flows, to reduce peak flows (and therefore flood risk) and to mitigate the effects of algal growth in rivers during prolonged periods of dry, sunny weather. Compensation water and freshets are released to maintain the flow downstream of the reservoirs and compensate the rights of downstream water users. Provision for this is given under CAR licences, which outline the volume and rate of releases. For the majority of reservoirs within the catchment, the volume and timing of compensation and freshet releases were set in the 19th century when little was known of the rivers' ecological needs. Under the WFD the ecological impact of impoundments has been considered and, where necessary, release regimes altered to improve ecological conditions downstream. The Habitats Directive requires reservoir release regimes to be reviewed to ensure they protect, where possible, and enhance, where feasible, downstream ecological conditions.

## Strategic Aim 3

Maintain and enhance the status and distribution of riverine, riparian and wetland species, and habitats of conservation interest

### CURRENT STATUS

The Tweed and its tributaries have a wide diversity of habitats, which support an array of flora and fauna. The large number of major tributaries of the Tweed, each rising from sources of differing geology and topography, has resulted in the formation of rivers which are quite distinct in their own right. In this respect, the Tweed system is very much a collection of rivers rather than a single entity and this, in turn, has led to a great diversity of riverine and riparian habitats and species.

The main features of interest of the rich aquatic and riparian fauna include otters, Atlantic salmon, sea trout and brown trout, lampreys and a great variety of invertebrate fauna. In addition, the Tweed system is known for healthy populations of many birds, which include osprey, kingfishers, yellow wagtails, dippers, black-headed gulls and oystercatchers, as well as a large population of mute swans, particularly within the estuary. This rich diversity of habitats and species on Tweed has led to various conservation designations being conferred upon sections of the catchment including Special Area of Conservation (SAC), Site of Special Scientific Interest (SSSI), Special Protection Area, RAMSAR and National Nature Reserve(s). Where appropriate, the CMP will help develop and take forward specific actions to improve the biodiversity of riverine, wetland and riparian habitats.

**Objective 3.1**

**Ensure access to data on riverine, wetland and riparian habitats and species to inform sustainable management practices.**

**ISSUES**

To maintain and enhance the status and distribution of riverine, riparian and wetland species and habitats, high quality accessible information is required upon which to base management decisions. If biological trends, impacts and changes are to be successfully monitored then there is a need for comprehensive baseline data.

Historically, within the Tweed catchment, there have been many organisations and individuals collecting and storing data on species and habitats. Coordinating disparate recording activity and ensuring that the resulting information/data are readily available is of primary importance. This function has historically been the remit of biological records centres, namely the Wildlife Information Centre (Scottish Tweed) and the Environmental Records Information Centre North East (English Tweed). However, recent internet-based initiatives such as Scotland's Environment Web and the Environment Agency's Catchment Data Explorer, now provide access to the large multi-year WFD aquatic monitoring dataset. With such disparate data sources, there is a need to signpost access and support users in utilising the various data tools.

**Target 3.1.1 – Continue to gain knowledge of the extent, status and distribution of riverine, riparian and wetland habitats.**

Generally, habitat data is less widely recorded than species data. However, there are a number of standardised methodologies that are used to monitor and assess riverine and associated habitats such as River Habitat Survey (RHS) in England and Morphological Impact Assessment System (MiMAS) in Scotland. To target and prioritise conservation, restoration and enhancement programmes, current habitat areas need to be assessed, mapped and put into the context of their historical distribution.

**Target 3.1.2 – Improve knowledge and understanding of species of conservation interest.**

Whilst the broader needs of many species will be met through careful habitat management, there is also a need to improve our knowledge and understanding of the most threatened species if we are to ensure their ongoing conservation. For example, the Tweed Foundation is already carrying out much work on the fisheries of the Tweed system, however, sustainable management can only be ensured through ongoing monitoring of all species of conservation interest.

**Objective 3.2**

**Promote the restoration of ecosystems, ecosystem function and ecosystem services.**

**ISSUES**

The intensification of agriculture over the last century coupled with increased forestry and urban development has seen a corresponding decline in the ecological range and diversity of the catchment's landscapes and habitats through activities such as overgrazing, drainage and channelisation. These impacts (habitat loss, degradation and fragmentation) on ecosystem function have, in turn, impacted the area's ability to provide ecosystem services. There is a real need to protect and enhance the riverine, riparian and wetland habitats of the Tweed catchment to benefit both the wildlife and the landscape value of the region, protect the area's biodiversity and safeguard habitats and species of local, national and international importance.

**BOX  
2**

## THE EDDLESTON WATER PROJECT

The Eddleston Water flows 20km north to south before joining the River Tweed at Peebles. Over time, the course of the river has been extensively altered and long sections were straightened in the early 19th century to improve agricultural production. Other changes in land management, in both the river valley and the surrounding hill slopes, have also altered how the land drains. Together, these changes have resulted in an increased risk of flooding to Eddleston and Peebles, as rainfall and flood waters travel ever more quickly and directly from hill slopes and along the river channels. At the same time, these changes have also damaged the river environment itself, leading to reduced water course length and habitat loss for plants and animals.

The three main aims of the project are to restore or enhance ecosystem function/services by:

- investigating the possibility of reducing flood risk to the communities of Eddleston and Peebles by restoring some of the original natural features of the river, its floodplain and surrounding hill slopes;
- examining the potential to improve the river habitat for wildlife and fisheries;
- working with landowners and communities in the Eddleston valley to maximise the benefits they could gain from such work, while maintaining the profitability of local farms.

A series of practical works are now taking place throughout the catchment and are being closely monitored. Working with land managers we have been able to introduce subtle changes to current land management practices in order to slow water flow from the hills, create floodwater storage areas and reconnect the river with its floodplain.

So far we have carried out the following on 17 separate farms:

- 66 hectares of riparian woodland created which will help increase rainfall interception, evapo-transpiration, soil infiltration and, also, slow overland flow
- 16,000 metres of fencing and over 70,000 native trees planted
- 1.8km of river re-meandered. This has increased river length, reduced the slope and speed of water flow and provided more space for flood waters, as well as creating new habitats and improving the landscape.
- 89 'high flow restrictors' installed that will encourage out of bank flow and hold back water in the headwaters
- 19 leaky ponds created (7000 square metres). These wetland features have a good deal of 'free board' built in so that they will store water during intense rainfall events.

Monitoring the effects of these measures is an important part of this project. A network of rain gauges, groundwater and river level gauges have been installed throughout the valley to collect data on how the changes affect river flows and flood frequencies. Other monitoring programmes will reveal what changes occur to the river's habitats and wildlife. Detailed monitoring and modelling of the groundwater has also been undertaken at a site close to Eddleston village.

**Target 3.2.1 – Encourage the strategic development of habitat networks throughout the catchment, linking riparian, floodplain, wetland, upland and native woodland habitats.**

Habitats rarely function in isolation. There is an opportunity to increase the abundance and diversity of wildlife by protecting, connecting and expanding habitat fragments and, in Scotland, the National Planning Framework carries an action to develop a ‘National

Ecological Network’. The Tweed and its tributaries link habitats and species throughout the catchment, spanning whole geological and altitudinal ranges. In a number of areas, a corridor of semi-natural habitats has been formed around the river network. If ecosystem function is to be enhanced then a catchment, or subcatchment, based approach is required, which considers a range of habitats and how they interact with each other.

A number of organisations such as Tweed Foundation, the Northumberland National Park Authority and Borders Forest Trust have already carried out much habitat enhancement work, much of it in the riparian zone. Tweed Forum is also an active agent in delivering wetland-related habitat projects, proactively recruiting projects to ensure that the right measures are taken up in the right places, at the right scale. One such example is the River Till Restoration Strategy. This initiative, led by Tweed Forum, seeks to work with farmers and land managers within the Till Catchment to restore the river Till. Several of the restoration measures include removing modifications that are no longer needed; changing in-channel management; improving riparian land management; and channel or floodplain restoration.

A key delivery mechanism for this target is the SRDP, with Tweed Forum utilising this funding source to tackle key issues such as diffuse pollution, natural flood management and habitat loss in those areas where it is most required, e.g. upland blanket bogs. To maximise the benefits Tweed Forum works very closely with the other major NGO habitat facilitators in the region; Borders Forest Trust (focusing on woodland expansion) and Southern Uplands Partnership (focusing on heather and moorland restoration).

**Target 3.2.2 – Encourage the retention and expansion of wetlands and natural ponds to safeguard and enhance ecosystem services.**

The Tweed catchment is home to an outstanding variety of wetland habitats. This includes internationally recognised lowland raised bogs and mosses, such as the Whitlaw Mosses, in addition to upland mires, flushed wetlands and blanket bog. These provide important ecosystem services such as habitat for scarce plant communities and insects (such as rugged stonewort or fibrous tussock sedge which is found nowhere else in the UK) as well as serving an important function in reducing diffuse pollution. Wetland environments have also been important in providing archaeobotanical data, such as pollen, which provide a historical record of the range of vegetational communities within the catchment. However, wetlands found within the catchment today are only a fraction of what was there in the past. As a result of state aid for agricultural improvements, large areas of the catchment were drained in the early 19th century, continuing through to the late 20th century, resulting in habitat loss, degradation and fragmentation. The Tweed Wetland Strategy (see Target 3.2.3) supports this target by raising awareness of the importance of wetlands and by outlining priority areas for restoration.

**New Statistical Account (Anon 1841)**

*Parish of Coldstream ‘Many species of wildfowl which formerly frequented the Tweed have entirely disappeared – such as the Coot, wild duck, diver and teal. This is to be accounted partly from the drainage of those marshy lands in which these birds used to breed.’*

### **Target 3.2.3 – Develop and implement a wetland and riparian habitat strategy to inform future management.**

The riparian zone is crucial to the integrity and productivity of the river; it provides essential habitats, protects riverbanks from soil erosion, aids flood attenuation and helps to maintain water quality by creating a buffer zone that traps sediment and pollutants. Much has been done in recent years to reverse the degradation caused by agricultural pressures. More recently, work has begun to restore and create wetland areas (such as ponds, scrapes, mires, fen, lowland raised bog and blanket bog) and the publication of a North East Wetland Feasibility Study and the Borders Wetland Vision provided critical data on existing/potential wetland sites. The Tweed Wetland Strategy, published in 2010, is being supported in its implementation by a wide variety of mechanisms including biodiversity offsets, the Peatland Action Fund and SRDP incentives.

### **Target 3.2.4 – Conserve and enhance the fisheries of the Tweed catchment.**

The Tweed catchment currently represents around 15% of all spawning water available to Atlantic Salmon in Scotland and is one of the most important salmon fisheries in the UK. As well as sustaining internationally important stocks of both salmon and trout, the Tweed is also home to important populations of the three lamprey species found in the UK. Other fish species found in the Tweed system include grayling, eels and sea trout, as well as the rare allis shad, a freshwater-spawning relative of the herring.

The River Tweed Commission (RTC), under the Scotland Act (River Tweed) Order 2006, is charged with the general preservation and increase of salmon, sea trout and other freshwater fish in the River Tweed and its tributaries. The Tweed Foundation is a charitable trust set up by the RTC to 'promote environmental protection and improvement by conserving and enhancing all species of freshwater fish and their environments in the Tweed [Fisheries] District'. The management activities of the Tweed Foundation are set out in the Tweed & Eye Fisheries District Fisheries Management Plan. Through the work of the Tweed Foundation the majority of the Tweed catchment is now open to salmon for the first time in 190 years - the last remaining obstacles in the system were removed in 2002. The Tweed Foundation carries out a range of research and monitoring work including genetics analysis and electro-fishing monitoring. The RTC also employ bailiffs, who are responsible for ensuring the Tweed Fisheries legislation is enacted. The bailiffs act as river wardens; monitoring fish stocks and habitat changes on a daily basis.

Other key stakeholders delivering on this target include Tweed Forum and the Federation of Border Angling Associations. Tweed Forum has now become the main agent in actually improving the building blocks upon which the fishery is based. Restoring degraded watercourses, fencing off and planting trees alongside nursery and spawning areas, improving water quality and buffering against drought and floods are all areas of Forum work that help improve habitats and enhance fish stocks. The Federation of Border Angling Associations was set up to coordinate and represent the many different angling associations operating within the catchment. It exists to promote the interest of angling as a sport in the Borders and conserve the interests of Border anglers.

## **Objective 3.3**

**Monitor and control the introduction and establishment of non-native riverine and riparian species and where appropriate control or eradicate established populations.**

### **ISSUES**

Invasive non-native animal and plant species are threatening key habitats and species throughout the Tweed catchment, through disease, predation, direct competition and hybridisation. Some invasive non-native

species are already firmly established in the catchment such as Giant Hogweed, Japanese Knotweed and American signal crayfish. Australian swamp stonecrop has also been found at two sites on the Till. Others such as Chinese mitten crab and the quagga mussel have been highlighted as a risk but are yet to invade the catchment.

There is a need to control and, where feasible, eradicate established non-natives that are threatening native habitats and species. Some work is already progressing in this area. For example, the Tweed Invasives project (see Box 3) is working to control Giant Hogweed and Japanese Knotweed in the catchment and the Tweed Biosecurity Plan is now being implemented. The Tweed Biosecurity Plan Group meets annually to review and update the Tweed Biosecurity Plan and to share information and knowledge. The WFD also requires that member states prevent 'deterioration' of the water environment and control of non-natives is clearly relevant to this requirement.

There is also legislation in place to guard against the introduction and spread of non-natives. For example, under the Wildlife and Countryside Act 1981, any person who releases or allows to escape into the wild any animal which is not resident or a regular visitor to Great Britain in a wild state or is included in Part I of Schedule 9 of the act will be guilty of an offence. However, application and enforcement of this legislation remains a major challenge. The legislative framework for managing non-natives in Scotland changed in 2012 when the Wildlife and Natural Environment (Scotland) Act 2011 (WANE) came into force. With the advent of WANE it became an offence to: release or allow to escape from captivity any animal to a place outwith its native range; cause any animal outwith the control of any person to be at place outwith its native range; plant or otherwise cause to grow any plant in the wild outwith its native range.

**BOX  
3**

### THE TWEED INVASIVES PROJECT

The Tweed Invasives Project has been delivering comprehensive control of Giant Hogweed and Japanese Knotweed across the Tweed catchment since 2003. The project, which expanded to include Himalayan Balsam control within the Till subcatchment in 2005, uses various elimination methods along 300 miles of riparian corridor, including spraying (with certified herbicides) and hand-pulling, to ensure that these invasive species are prevented from flowering each year. For plants such as Giant Hogweed, with a seed-life of up to 12 years, this is vital in ensuring the eventual eradication of the species from the Tweed catchment. The project is a close collaboration between Tweed Forum staff and local landowners, farmers, ghillies, fishermen and volunteers. This means that the control work is carried out in partnership, a key factor in the success and longevity of this flagship project which has garnered over £1 million in funding over the last 13 years.

**Target 3.3.1 – Improve knowledge, understanding and awareness of the potential threats of non-native riverine and riparian species and the need to prevent their introduction.**

Non-native species are often introduced inadvertently, without consideration of the damage that can result. This means that education is key in preventing further introductions and co-ordination of information sources on invasive species and how they are transplanted is a stated objective of the Tweed Biosecurity Plan. For example, anglers need to be made aware of the need to clean and treat all fishing equipment which has been used outside Britain and the 'check, clean and dry' campaign has gone some way to raising awareness. Gardeners also need to be more aware of which species are classed as invasives and this has led to creation of the 'Be Plant Wise' campaign. Education also has a role to play in halting the spread of already established invasive non-native species. Information on identification and control methods should be made widely available and reporting systems put in place to enable people to report sightings of any potentially threatening non-native species.

**Target 3.3.2 – Prevent, control and where possible eradicate priority non-native species.**

There are a number of priority non-native species in the Tweed catchment including, Giant Hogweed, Japanese Knotweed, Himalayan Balsam, and American signal crayfish. Giant Hogweed and Japanese Knotweed were introduced into the Tweed catchment in the 19th century as ornamental plants. In the absence of natural competition, they, along with Himalayan Balsam, have aggressively colonised large areas of the catchment's riverbanks and riparian woodlands, out-competing native plant species. This has resulted in degraded ecosystem services and the problems posed by these invasives have steadily increased over the years as more and more areas have been colonised.

American signal crayfish were first detected in the Tweed catchment in 2005 in the Ettrick Water and Leithen Water, with a secondary population detected in the Till subcatchment in 2006. American signal crayfish severely impact freshwater ecosystems by eating freshwater insects, beetles, frogs, juvenile fish and eggs, including Atlantic salmon. They also exhibit burrowing behaviour which undermines riverbanks and other riparian features. It is a criminal offence to either keep or release American signal crayfish except under licence, however, lack of awareness of the impact of these creatures and the penalties associated with them is a major factor in their continuing spread.

The Tweed Invasives Project, launched in September 2002, is an ambitious project aimed at the long-term, sustainable control of Giant Hogweed and Japanese Knotweed within the Tweed catchment and river Tweed within the Till subcatchment. The project co-ordinates the treatment of these species in partnership with local landowners, riparian interest groups and statutory authorities within the Tweed catchment. In addition to controlling invasive plants across 300 miles of water course, the project works to share best practice in this field and is considered one of the most successful catchment control programmes in the UK.

Methods for the control of non-native species are always evolving and keeping abreast of the latest science may be key to effective delivery. Tweed Forum are currently trialling the novel use of a 'rust fungus' to control Himalayan Balsam in the Till subcatchment. This biological control agent has only recently been licensed for use and the trial is being delivered in partnership with key stakeholders.

## Strategic Aim 4

Restore modified/impacted channels and ensure all riverwork operations respect the physical, ecological and aesthetic integrity of the river system

### CURRENT STATUS

Rivers are, by nature, dynamic systems, continually modifying their form through processes of erosion, transport and deposition. A wide range of different channel types and rates of channel adjustment are evident in the Tweed catchment, from the swift, shallow, boulder-strewn waters of the Ettrick Water to the sluggish, meandering, sandy channels of the middle Till. Early efforts to manage and control the river channels of the catchment were driven by the need for waterpower within the textile industry and the improvement of agricultural land. More recently, river management issues such as bank erosion, gravel management, flood alleviation, bridge protection and in-stream habitat improvements have been the focus. As a result of this, river engineering works such as rock revetment and croys now affect much of the Tweed system.

The regulation of riverworks is a complex issue, with four statutory consultees on each side of the border. The Tweed Forum Riverworks Group has been working for many years to make the system more streamlined and transparent. However, this has been largely superseded in recent years by the advent of the WFD and the SEPA-administered CAR. Whilst CAR provides a transparent framework for regulating riverworks in Scotland, this is still complicated by Habitats Directive legislation and there is a need to streamline regulatory processes. The issue of cross-border integration is also key here and, in England, the process has been unchanged for years, with applications submitted to either Natural England under the Countryside & Rights of Way (CROW) Act or the EA under the Water Resources/Land Drainage acts.

### Objective 4.1

**Improve understanding of the impact of riverworks and seek to address degraded stretches.**

#### ISSUES

The Habitats Directive and WFD have contributed positively to riverworks management and there is now a growing body of information to support and inform decision-makers. However, detailed hydrogeomorphological information at the local level is still required as generic prescriptions to mitigate against the negative effects of a given riverworks operation are rarely effective. It is also essential to understand the causes of the problem before undertaking any remedial riverworks as, if the original cause has not been correctly identified, the proposed works may be ineffective or may even make the problem worse. Connectivity up- and downstream needs to be recognised, as does connectivity between the river and its floodplain. In effect, each riverworks operation must be considered on a case-by-case basis. The mutable nature of rivers also complicates matters further, in that, any action taken in year one may not be suitable/advantageous in subsequent years.

To encourage landowners and riparian owners to minimise impacts upon the river, it is essential that the organisations responsible for regulating riverworks are coordinated and integrated in their approach and that

it is clear where to go to for any advice. In addition, there needs to be opportunities to learn from each other about successful and unsuccessful riverworks activities. Having improved the knowledge base of individuals and organisations, it is important that we facilitate appropriate remedial action to improve degraded stretches.

**Target 4.1.1 – Improve knowledge of the hydrogeomorphology of the river system.**

If we are to successfully manage riverworks in the Tweed catchment then it is essential that we have a clear understanding of the natural dynamics of the river system and a number of hydrogeomorphology studies have already been undertaken within the catchment e.g. the Eddleston Water Project . In addition, a historical context is required for current river processes to enable past and present rates of channel activity to be identified and appropriate management strategies devised. This can be gained from old photographs, maps, archaeological work and logged events, as well as through engaging with people with historical knowledge of the catchment's rivers.

**Target 4.1.2 – Improve knowledge of current and historical riverworks throughout the catchment.**

In addition to understanding the rivers' hydrogeomorphological processes, effective decisions on individual riverworks need to be made within the context of how the natural river systems have already been artificially modified. In this respect, the cumulative impact of riverworks need to be taken into account. Records of riverworks are held by a number of organisations, including SEPA, SNH, the EA, RTC and Tweed Forum, and people living and working in the catchment have a wealth of knowledge on how specific riverworks have performed.

**Target 4.1.3 – To further promote best practice and strengthen provision of advice to anyone considering riverworks within the Tweed catchment.**

Riverworks is a complex subject, and there is a growing body of information for people wishing to carry out work on the river. Demonstration sites showcasing appropriate techniques to deliver riverworks are proliferating within the Tweed catchment and there are several locally specific guidance notes available, in addition to the support available from the statutorily responsible bodies such as SEPA, SNH, the EA and Natural England. It is vital that we ensure access to the various sources of support and continue to update these sources as our knowledge base grows.

**Target 4.1.4 – Identify the different groups involved in riverworks and develop suitable methods to engage, learn and raise awareness of management issues.**

There are many organisations, statutory authorities and private landowners involved in riverworks within the Tweed catchment. Public bodies undertake riverworks such as bridge repairs and flood alleviation works, while the majority of the riverworks carried out by private landowners are for fisheries improvement. Education and awareness-raising is now working effectively within, and between, each of these groups. However, we must continue to monitor progress on this front.

Riverworks management involves a wide range of interacting and interdependent factors. Many of those tasked with managing riverworks have their own specific area of expertise such as species and habitat conservation, fisheries management or highway maintenance. However, in some instances, there is little specific knowledge on riverworks issues themselves, or appreciation of the interdependent nature of many of the issues surrounding riverworks management.

**Target 4.1.5** – Investigate and facilitate the restoration of priority waterbodies which are failing WFD targets due to physical condition.

Specific data on the impact of morphology on the ecological status of a water body should be forthcoming via the RBMP process and it is vital that we use this information to inform restoration efforts throughout the catchment.

## **Objective 4.2**

**Work with regulatory bodies to ensure that riverworks processes are as streamlined and efficient as possible.**

### **ISSUES**

The large number of overlapping pieces of legislation regarding riverworks, coupled with the cross-border nature of Tweed, makes the regulatory process for riverworks extremely complex. On the Scottish side we have CAR (implemented by SEPA), the Habitats Directive (implemented largely by SNH), Planning law (local authority) and the Tweed Acts (River Tweed Commission). On the English side, the EA and Natural England have jurisdiction under the CRow and the Land Drainage and Water Resources acts. Whilst there has been considerable simplification and streamlining of the process on the Scottish side, in both cases there is the requirement, by the Habitats Directive, for all operations to be assessed to determine any impact on the designated site. This has caused duplication of effort in the past and there is still a need to make the process more efficient and pragmatic.

**Target 4.2.1** – Support the Controlled Activities Regulation (CAR) process to ensure transparent and effective regulation.

With support from the CMP partnership we can ensure that the CAR process within (Scottish) Tweed is implemented effectively and transparently. A cross-border protocol has been developed to assist agencies with cross-border regulation and work is also underway to ensure that there is consensus on what can be consented either side of the border, see Box 4 overleaf.

**BOX  
4**

## TWEED CROSS-BORDER RIVERWORKS

### Tweed Cross-Border Riverworks - A Working Protocol

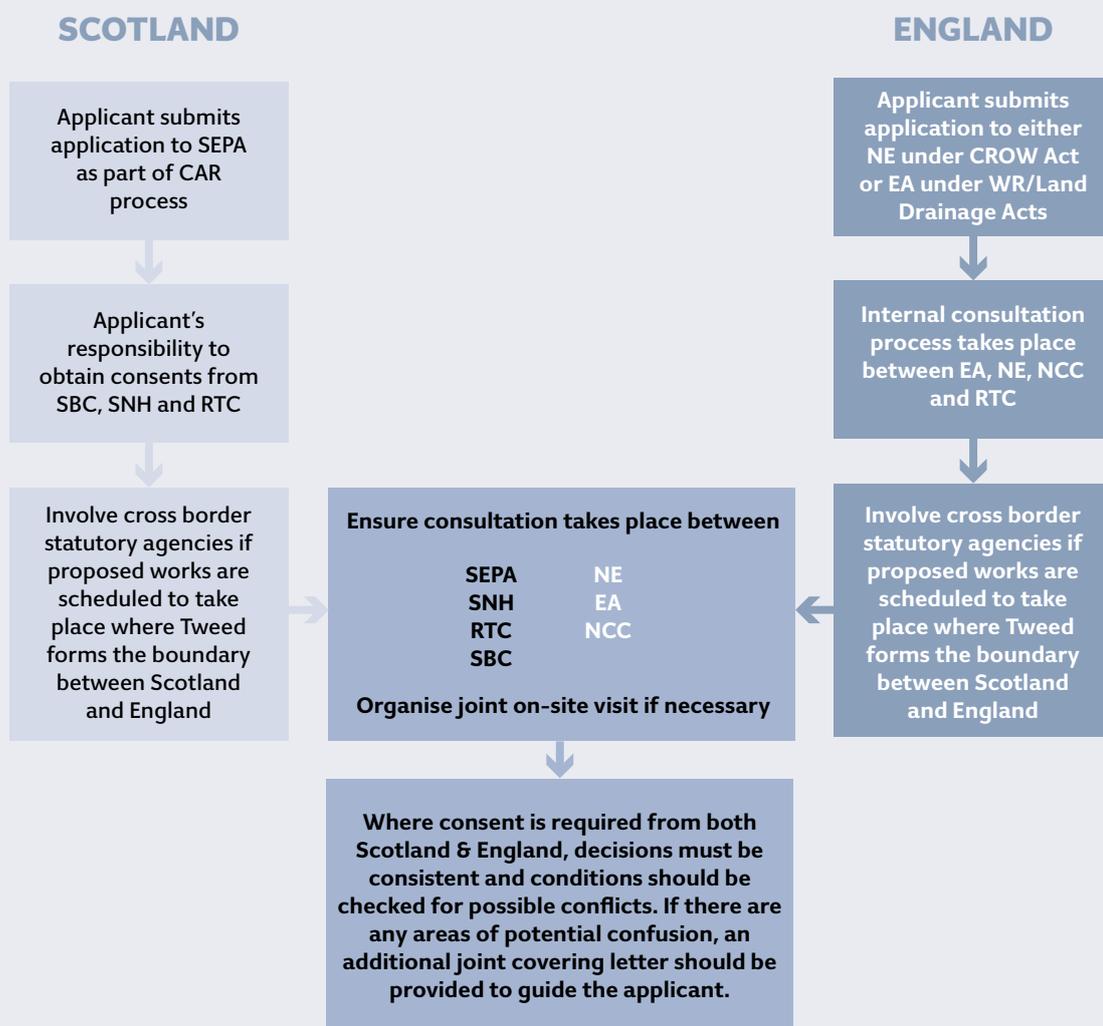
#### Proposed situation under Working Protocol

#### Basic Principles

The Memorandum of Understanding applies when:

- a) the proposed riverworks are scheduled to take place where the Tweed forms the border and/or
- b) where there might be an impact across the border.

There is a need to ensure the relevant statutory agencies are involved in the process and the consents are coordinated where required. The circulation of draft consents between agencies would be useful in ensuring coordination.



## Strategic Aim 5

Adopt a catchment-based approach to flood management which helps protect the people, property and prosperity of the Tweed catchment whilst respecting its physical, ecological and aesthetic qualities

### CURRENT STATUS

The flooding of water courses at times of peak flow is a natural process which can bring both benefits, e.g. the input of rich sediments to depleted fields, and harm, through the destruction of property/infrastructure and even loss of life. The Tweed has a long history of flooding with the largest and most widespread flooding in living memory occurring during August 1948, when severe flooding was seen on the lower stretches of the Tweed, on the Gala Water, Leader Water and particularly in Berwickshire. Other significant floods in the catchment included a more localised flood on the Till in September 2008 and 2009, flooding of the Gala and Jed waters in 1984 and on the Ettrick and Yarrow in October 1977. It is currently estimated that just over 9% of the catchment's properties are considered at risk from flooding (Werritty et al 2002). This equates to some 4,575 'at risk' properties, the majority from riverine flooding as opposed to coastal flooding.

While flooding is a natural process it can be exacerbated by activities such as canalisation; riverworks; modification and diversion of rivers; land drainage; poor agricultural and forestry practices or floodplain development. Addressing those land management practices that increase flood risk will aid effective and sustainable flood management. However, there is also a need to avoid short-term localised solutions and move towards a more catchment-based approach which does not transfer problems from one part of the catchment to another. Indeed, a catchment based approach is required by EU legislation, such as the WFD and Floods Directive, as is the need for exploring land management practices that allow the natural processes of a river to function (Sustainable Flood Management).

### Objective 5.1

**Improve knowledge, understanding and awareness of flood management issues within the Tweed catchment.**

#### ISSUES

With climate change models predicting increases in frequency and intensity of precipitation (UKCP09) it is likely that there will be an increased risk from flooding in the future. If we are to effectively manage this increased flood risk then we need to improve our knowledge and understanding of flood risk management issues and ensure that those at risk are fully aware of whom to contact for help and advice. A key remit of the Tweed Flood Risk Management Local Advisory Group is to improve knowledge and understanding of flooding in the Scottish Borders, while the EA has been working with a wide range of stakeholders, including local authorities and community groups, to help improve its understanding of flood management issues.

**Target 5.1.1 – Identify the different groups involved in and affected by flood management in the catchment and develop suitable methods to educate and raise awareness.**

A wide range of interests are involved in and affected by flood risk management issues. This includes those with statutory remits to manage, control and protect against flooding, land managers whose working practices have the potential to exacerbate flooding frequency and intensity, planners whose decisions can result in the conservation or impairment of the natural floodplain, as well as those whose homes and businesses are at risk from flooding. Focused, meaningful awareness-raising is now being delivered by the flood risk management planning process as well as opportunities to learn about the experiences and requirements of the different groups. For example, SEPA and the EA both support the Floodline service (which provides easy access to up to date information on flood risks and river levels) and Scottish Borders Council have produced a leaflet ('Emergency assistance to the Public') which outlines the extent of short term assistance provided to householders and businesses to avert or alleviate the effects of flooding. Scottish Borders Council has encouraged and supported the setting up of local self-help groups in flood warning areas, providing both equipment and training, and a similar initiative is now running in Northumberland. The Scottish Flood Forum works in partnership with local authorities and the voluntary sector to enable community groups to deal with flood issues. Scottish Borders Council has also taken forward a subsidised flood protection products scheme to encourage those at risk to be prepared for the eventuality of a flood.

**Target 5.1.2 – Deliver the strategic flood risk management planning process required under the Floods Directive.**

As a cross-border catchment, responsibility for flood management is split between English and Scottish authorities. In Scotland, SEPA and local authorities take the lead role, while in England, this responsibility falls to the EA and Lead Local Flood Authorities. Development control and planning responsibilities, which are important components of flood management, are also split within the Tweed catchment between Scottish Borders Council on the Scottish side and Northumberland County Council on the English side. Sustainable flood management relies on a catchment-based approach however, in a cross-border catchment such as Tweed, there are clearly a number of different approaches to flood management across a wide range of organisations. To move towards a catchment-based approach to flood management there is a need to improve communication and coordination between the different approaches and different organisations involved. The severe flooding experienced in the Cheviots in 2009/10 s showed exactly how important this is with, for example, floodwaters and sediment generated in Scotland, on the Bowmont Water, having major implications for land managers and communities downstream in England. The Tweed Cross Border Advisory Group has been formed, under the Floods Directive, to address such cross-border issues.

## **Objective 5.2**

### **Encourage Sustainable Flood management, where appropriate.**

#### **ISSUES**

Flooding is a natural process which can have terrible consequences for humankind and there has been a long history of flood management within the catchment. Recognising that flooding is a natural consequence of climatic variation, many flood management experts are now turning to the model of sustainable flood management (SFM) which promotes a catchment based approach, emphasises 'soft' engineering solutions (rather than 'hard' engineering such as concrete barriers), and incorporates all aspects of social, economic, planning and natural processes in delivering flooding solutions. While WFD and, in Scotland, Floods Directive, legislation puts a duty on the relevant authorities to promote SFM there needs to be a clearer understanding

of the individual elements that make up SFM and how best to apply the model to specific areas and specific needs.

#### **Target 5.2.1 – Protect the floodplain from inappropriate development.**

Natural floodplains can make an important contribution to the long-term reduction of flood risk and appropriate management offers considerable natural heritage benefits. Floodplain development reduces the river's ability to rejuvenate and create new habitat, and alters natural patterns of sediment transport and nutrient exchange. It can also affect the relationship and recharge of groundwater resources in the area and can reduce floodplain storage. Scottish Borders Council planning policies promote protection of the floodplain and development is not permitted where it would be at risk from flooding, would intensify the risk of flooding, would require high levels of public expenditure on flood protection works or would result in extensive channel modification. Indicative flood risk maps, published in 2013 as required by the Floods Directive, are now being used by planning authorities to inform decisions on planning applications.

#### **Target 5.2.2 – Pursue opportunities for Natural Flood Management (NFM).**

In many instances, rivers have been hydraulically isolated from their floodplains as a result of development, decreasing the incidence and duration of rivers flooding onto the floodplain. This has resulted in habitat loss for wildlife and reduced the ability of floodplains to carry out many of their natural functions such as flood control and nutrient sediment storage. Natural flood management (one element of sustainable flood management) seeks to restore natural riverine processes in order to alleviate flooding further downstream and has been the focus of one of the catchment's flagship projects, the Eddleston Water Project (see boxes 2 and 5).

### **BOX 5 NATURAL FLOOD MANAGEMENT (NFM) IN THE TWEED CATCHMENT**

The Tweed is a flagship catchment for NFM research and development within the UK. There are many sites within the Tweed catchment that incorporate elements of NFM, with two sites, the Bowmont-Glen and Eddleston Water, having formal monitoring regimes in place to assess the efficacy and robustness of the suite of NFM measures deployed. The range of NFM measures in use throughout the catchment range from woodland planting, wetland creation, woody debris structures, floodbank removal and re-meandering of straightened channels. These measures are designed to 'slow the flow' of surface water run-off by harnessing the natural capacity of the landscape to retain water. Slowing surface water run-off reduces flood peaks, making flood events more manageable for the communities impacted by them.

#### **Target 5.2.3 – Ensure all flood protection schemes respect the physical, ecological and aesthetic integrity of the river system.**

In the past the widely held view has been that flood protection could only be achieved through 'hard' engineered flood defences, such as concrete channels, barriers and so on. Existing developed urban areas situated on the flood plain may require flood defences, however, it is important that these do not result in loss of wildlife, habitats and visual amenity.

### Objective 5.3

## Evaluate and address the impact of land management practices on the frequency and intensity of flood events.

### ISSUES

Whilst flooding is a natural event, its frequency and intensity can be exacerbated by land management practices. A clear example of this was seen in the Tweed catchment in the middle of the 19th century when complaints were made about the effect of hill drainage on the catchment's hydrology. Floods were said to have become more severe and of shorter duration and were attributed to an increase in the rate of the run-off due to the presence of drains and the absence of wetlands (where water could be held for longer periods).

#### New Statistical Account 1836

*'The rain which formerly filled the bogs or side of hills, and which then kept giving a constant and regular supply to the river, is now carried off at once by these drains.....causing sudden and violent floods, as short as they are sudden.'*

Development which increases the area of impermeable surfaces, poor forestry and farming practices (such as badly aligned ploughing and drainage), intensive sheep farming and inadequate or inappropriate culverting are all examples of land use practices which can cause changes in runoff characteristics and increase flood risk. Work in Wales (The Pontbren Farmers Project) has shown that rainfall infiltration rates are very low on sheep pasture, compared to new hillslope woodlands. This results in faster run-off from large areas and can exacerbate soil erosion and flooding.

### Target 5.3.1 – Ensure land management practices do not adversely impact on flooding frequency and intensity.

Much is now known about the impact of land management practices on extreme flows. In the forestry sector, advice on the impact of forestry on flood events has been updated in the most recent edition of the Forests and Water Guidelines. However, it is important that the results of long-term catchment studies and the advice contained within the Forests and Water Guidelines continue to be fed into forestry management practices within the Tweed catchment. It is generally accepted that riparian and floodplain woodlands have the ability to reduce peak flood flows but more data is required. The Forestry Commission has been increasing its research in this area and there are more and more opportunities for research both in terms of funding and sites. The Eddleston Water Project is one such site locally (see Box 2). Agricultural practices can also impact on flooding and knowledge of how this occurs and how to mitigate against it is steadily growing. Issues such as soil compaction due to use of large farm equipment, inappropriate crop cultivation regimes and drainage of upland areas are of key concern.

## Strategic Aim 6

Promote the sustainable development of river-related tourism and recreation and protect cultural heritage and landscapes

### CURRENT STATUS

Tourism is an important sector of the area's economy, with the Tweed catchment attracting international, national and local visitors. The area is particularly well-endowed with outdoor recreational opportunities, which include walking, fishing, birdwatching, cycling, canoeing and a wealth of heritage sites. The dual and potentially conflicting objectives of protecting a natural resource and increasing tourism and recreational facilities have to be managed carefully. Opportunities need to be identified, interests balanced and conflicts resolved, involving all relevant parties.

### Objective 6.1

**Support tourism and recreation activities which promote good practice, deliver multiple benefits and do not come into conflict with other aims and objectives set out in this document.**

#### ISSUES

The Tweed and its tributaries support a wide range of recreational activities from the bankside pursuits of sightseeing, walking, cycling and riding to water-based activities such as canoeing and angling. Access rights enable everyone to enjoy the outdoors provided they act responsibly in relation to people's privacy, safety and livelihoods and also respect wildlife and historic features. The Scottish Outdoor Access Code, defines responsible practice for a range of recreational activities and helps to minimise conflicts. In England, the CRoW makes provision for public access to the countryside, under a right to roam. While the Scottish Outdoor Access Code and the Countryside Code in England promote responsible access at a national level, there is also a need to tackle access issues at a local level and encourage different recreational users to understand and respect each other's activities. Also, the cross-border nature of Tweed can complicate access issues i.e. some land managers and access users need to be aware of both the differences in legislation between England and Scotland and where the actual border lies.

#### **Target 6.1.1 – Promote responsible access by all river users.**

Not all water bodies are necessarily suitable for particular recreational activities, either because of size, depth or other constraints such as a strong nature conservation interest. Developing codes of conduct can help to avoid conflict between river users and ensure protection of the natural environment and, where already in existence, such as the National Canoeists' Code of Conduct and the Tweed Angling Code, their adoption should be encouraged. If the Scottish Outdoor Access Code and the Countryside Code are to be effective then it is important that there is a clear understanding of their implications by recreational users as well as land managers.

#### **Target 6.1.2 – Ensure that water users acknowledge and respect each other's rights and responsibilities.**

While many recreational activities can co-exist, others are less compatible. For example, without a clear understanding and respect for each other's activity, conflicts between canoeing and fishing or between

trout and salmon anglers can occur. Some types of recreation can also adversely affect nature conservation interests through, for example, disturbance to wildlife or damage to aquatic plants. A planned approach to the management of sites shared by different users and activities, facilitated by dialogue between all interested parties, is required if resolution of such issues is to be achieved.

## **Objective 6.2**

### **Promote and establish tourism and recreational activities based on the built, natural and cultural heritage of the Tweed and its tributaries.**

#### **ISSUES**

The Tweed catchment offers a wealth of opportunities for tourism and recreation. There are a number of long-distance walking routes and cycling routes that pass through the catchment such as the Southern Upland Way, the Pennine Way and the Tweed Cycle Route. The Forestry Commission manages a large area of forestry in the catchment, which provides recreational opportunities such as mountain-biking/cycling, orienteering and bird watching. People come from all over the world to fish the internationally famous salmon rivers of the catchment. Trout fishing is also a major attraction. While much of the tourism of the Tweed catchment already uses the exceptional resources provided by the built, natural and cultural heritage of the area there is still great potential to attract further visitors, which in turn will strengthen the area's economy.

#### **Target 6.2.1 - Increase educational and interpretation facilities based on the built, natural and cultural heritage of the Tweed and its tributaries at appropriate sites.**

The Tweed catchment offers great potential for attracting visitors and developing their understanding and appreciation of the area's heritage. The Tweed Rivers Interpretation Project ran for six years between 1999 and 2005 as part of the larger Tweed Rivers Heritage Project. With a spend of around £500k this project enhanced and developed a number of key sites along the river through landscaping, provision of interpretation boards and in some cases the commissioning of artworks, such as the Temple of the Muses at Drygrange. The work of the Tweed Rivers Interpretation Project provided a string of interpretation sites along the Tweed and its tributaries including the Philiphaugh Salmon Viewing Centre. Education has a crucial role in both underpinning and linking together the component parts of the CMP, and must take place at a variety of levels and involve a wide range of groups.

#### **Target 6.2.2 – Support tourist and recreational activities based in and around the Tweed and its tributaries, which aid the sustainability of the local economy.**

The Tweed's international reputation as a premier salmon river attracts people from all over the world to fish its waters. It is estimated that it brings in over £18 million a year to the local economy and supports over 500 jobs. Tweed also has an excellent population of brown trout and grayling, which supports an important angling resource for local anglers and is increasingly marketed to visitors. With increasing competition from countries such as Russia and Norway it is important that measures are taken to continuously improve and upgrade the Tweed fishing experience to ensure Tweed remains a world class angling destination.

In the past, a Borders angling guide was published which contained all the information required to plan a coarse or fly fishing trip in the Borders, however in the past few years the 'Fish Tweed' website has come to the fore with information on most of the Tweed's salmon beats and contains a host of information to help people choose and organise a fishing trip to the Tweed. Visitors to the site can check river levels, fishing availability and book salmon fishing online or by telephone. Nature based tourism is increasingly becoming a mainstream opportunity for landowners in the catchment to diversify their income, strengthen the area's economy and increase visitor numbers.

**Target 6.2.3** – Encourage the enhancement and expansion of the access network in and around the Tweed and its tributaries where it does not come into conflict with other objectives set out in this document.

A balance needs to be struck between protecting sensitive habitats and establishing and maintaining routes in areas that have been identified as being able to withstand recreational pressure. The Scottish Borders Access Forum is responsible for developing a strategic overview of access in the Scottish Tweed. The Access Forum has a wide membership of all access interests including walking, cycling and equestrian interests as well as local community access groups and government organisations such as SNH and the Forestry Commission.

## Strategic Aim 7

Ensure the delivery and development of the Tweed Catchment Management Plan

### CURRENT STATUS

The production of the Tweed CMP in 2003 was only the beginning of a much larger process. This process - to achieve the goals and aspirations contained within the CMP, thus ensuring successful delivery - was a challenge for the entire CMP partnership to take forward. In the twelve years of implementation since 2003, the CMP has changed most markedly in response to the WFD, the EU Floods Directive and, most recently, the LUS. This current revision of the CMP seeks to continue to integrate with the aims, goals and associated processes of all these initiatives and newly emerging policy directions.

### Objective 7.1

**Continue to ensure effective stakeholder engagement and interaction.**

#### ISSUES

It is now widely accepted that attempts to manage complex environmental situations will not be successful if they adopt exclusively 'top down' approaches which impose management practices on people. For the CMP to be successful, it is vital that it engages all stakeholders by responding to local needs and aspirations and not solely to overarching international and national policy. The Tweed catchment is very much at the forefront of partnership working in the UK and has been moving forward, since the CMP's inception in 2002, on the basis of partnership, cooperation, trust and negotiation, where the decision-making process is open to all potential stakeholders. Ownership, support and engagement from stakeholders are necessary precursors to concerted action on the ground. Without them, the CMP cannot succeed. In order to meet many of the aspirations set out in the CMP we must continue to address how we work together as individuals, organisations and institutions. We must continue to fully engage with and learn from all those who have an interest in, and are affected by, the catchment's management.

BOX  
6

## RIVER BASIN PLANNING ENGAGEMENT AND THE TWEED FORUM

The Water Framework Directive requires stakeholder engagement and public consultation throughout the river basin planning process and in the Solway Tweed, SEPA and the Environment Agency have facilitated this through the formation of two 'Area Advisory Groups' (AAGs): 'Tweed' and 'Solway'. In Tweed, the AAG has been co-delivered by the agencies and Tweed Forum, in response to strong opinions within the catchment that the Forum's stakeholder engagement programme should not be duplicated. Tweed is the only area in Scotland, and perhaps the UK, where another organisation has been co-opted to deliver an AAG and this is testament to the strength of Tweed Forum's presence in the catchment and the positive way in which the Forum is perceived.

**Target 7.1.1** – Ensure opportunities for ongoing involvement and engagement with the CMP and the RBMP process.

To enable consensus for action which is self-generating and has both vision and momentum, the CMP must create opportunities for the ongoing involvement and engagement of all interested parties. While information dissemination and awareness-raising are important components of this, active involvement and the opportunity to interact with and learn from other stakeholders are also key to the CMP's success.

BOX  
7

## TWEED FORUM AND THE UK RIVER PRIZE

In 2015 Tweed Forum won the inaugural UK River Prize which celebrates the achievements of individuals and organisations working to improve the natural functioning of the UK's rivers and catchments. It was Tweed Forum's demonstration of the power of partnership working at the catchment scale that won over the judges: 'Tweed Forum demonstrates the power of effective partnership; a focused unanimous voice working on behalf of the river and the people it links together. The judging panel were hugely impressed with the scale of work, the documented achievements and the long term vision for the River Tweed.'

The Forum's focus on working with land managers to get the right measures in the right place, at the right scale, in order to address key issues such as habitat loss, drainage, diffuse pollution, channelisation and invasive species control was a key factor in the judging panel's decision. Also impressing the judges was the sheer scale of the Forum's achievements in restoring and enhancing more than 60km of river through fencing off and native tree planting, re-meandering over 2km of straightened channel, installing 120 engineered woody debris features (flow restrictors, deflectors, gravel capture structures); removing 9km of flood embankment, planting 230ha of riparian woodland; creating 30 wetlands; enhancing 125ha of raised bog, damming 9km of ditch and controlling invasive plants along almost 500km of river.

**Target 7.1.2** – Develop a learning approach to the decision-making, development and delivery of the CMP and RBMP to ensure effective implementation.

To ensure collective action, the development and delivery of the CMP should continue to open up the decision-making process to all interested parties. By integrating science-based knowledge with local

knowledge and equally valuing knowledge from all sides, opportunities to learn from each other will be created. To enable this to happen, stakeholders and organisations need to have the necessary skills and capacity. Tweed Forum works to embody this kind of approach in the delivery of the CMP and has acted as a catalyst to bring stakeholders together and enable them to learn from each other's perspectives.

**BOX  
8**

## **UNESCO, TWEED FORUM AND HELP (HYDROLOGY FOR THE ENVIRONMENT, LIFE AND POLICY)**

HELP is a major UNESCO initiative that is creating a new approach to integrated catchment management. HELP works by bringing together catchment managers, scientists, policy-makers and local communities from river basins around the world to share best practice and learn from each other. The Tweed has been awarded global HELP Basins status, and Tweed Forum has been awarded UNESCO recognition for its work in the Tweed catchment. As Professor Shahbaz Khan, Global Co-ordinator for the HELP programme, commented: 'the Tweed Forum can be considered a model for other[s] for its work in setting a standard for Scotland and the UK'. The only UK institution designated by UNESCO under the HELP Programme is Dundee University's UNESCO Centre for Water Law, Policy and Science. As well as research and teaching focused on the interface between science and policy, we are the Coordinating body for the European HELP basins and are working closely with Tweed Forum.

**Prof. Chris J. Spray MBE**

Chair of Water Science & Policy, UNESCO Centre for Water Law, Policy & Science,  
University of Dundee

### **Objective 7.2**

**Overcome institutional barriers affecting the delivery and development of the CMP.**

#### **ISSUES**

Institutional barriers can occur both within and between organisations and can have a significant impact on stakeholders' ability to engage with and commit to the CMP process. For the CMP to succeed it must be responsive to the needs of a wide range of stakeholders within their own institutional contexts and tackle the problems and needs of agencies in terms of policy fulfilment.

**Target 7.2.1 – Continue to seek ways of streamlining our approach to the cross-border nature of water resource management in the Tweed catchment.**

Management of the UK's water environment has historically been fragmented with many agencies and organisations involved, including the European Union, government, statutory agencies, public agencies, commercial organisations, voluntary bodies and local interest groups. Even with the advent of the WFD and its requirement to manage catchments across political boundaries, the practical aspect of managing a cross-border catchment such as the Tweed with different legislative, policy and working arrangements on each side of the border, can be challenging. Progress in tackling this fragmented approach to water resource management has been made with local stakeholders showing a flexibility of thinking and a willingness to build capacity to support interdisciplinary and inter-organisational approaches. Tweed Forum continues to create opportunities for different sectoral interests to meet and learn from each other's perspectives.

**Objective 7.3****Review and monitor the effectiveness of the CMP.****ISSUES**

Monitoring progress in implementing the CMP's action plan and achieving the aspirations set out in the strategic objectives is essential in order to efficiently deploy effort and resources in the future. However, since the CMP cannot anticipate all eventualities, an ongoing review of the CMP document and its delivery mechanisms will enable it to be responsive to changing circumstances and reflect new information and knowledge. Monitoring and review activities should take place in partnership with all those who have been involved in implementation activities to ensure that all relevant information and knowledge is taken into account.

**Target 7.3.1 – Review and monitor the CMP at six yearly intervals.**

Local non-statutory initiatives, such as the Tweed CMP, cannot achieve effective sustainable solutions to problems which are overwhelmingly influenced by major national or international policies. Nonetheless, to be successful, the CMP must be sensitive to changes in political, social and economic contexts at national, regional and local scales. Reviewing the CMP and its delivery mechanisms should ensure it remains responsive to a wide range of interests as well as changing social, physical, economic and political circumstances. Monitoring progress towards achieving the actions set out within the CMP's action plan is also vital in encouraging stakeholders to engage in the process, however the non-statutory nature of the CMP requires a careful balance between celebrating and recording achievements and the perception of being 'held to account'. The non-statutory participatory nature of the CMP must be to the fore whilst understanding that any review of a plan and its processes requires knowledge of where progress has been made. During the review process, progress of actions must be monitored, priorities for action re-examined, additional actions and targets included where appropriate and key funding requirements identified.

**Objective 7.4****Ensure the CMP integrates with other relevant plans and processes.****ISSUES**

The CMP must integrate with other relevant plans and processes where appropriate, to ensure that common goals are delivered using a partnership approach. Whilst there is a general need to integrate with the large array of plans and strategies which influence the Tweed catchment, there are a number of key linkages which deserve special attention such as the RBMP process, the Floods Directive and the publication of the Scottish Land Use Strategy.

**Target 7.4.1 - Ensure key elements of other plans and processes are integrated into the CMP.**

The EU WFD, Floods Directive and LUS exert a strong influence on how the UK manages its water environment (see section i.vii). The CMP has made great progress in integrating with these key processes and must continue to do so to remain relevant and effective.

BOX  
9

## THE SCOTTISH BORDERS LAND USE STRATEGY PILOT

The Scottish Borders Land Use Strategy (LUS) pilot is non-regulatory and non-statutory. Arising out of the Land Use Strategy for Scotland, which is a requirement of the Climate Change Scotland Act (2011), the pilot offers a new way of looking at how land is used and managed in the Scottish Borders. The LUS pilot has produced a map-based tool or 'framework' which helps people make better long-term decisions about land use, at a time of rapid environmental, economic and social change. The various benefits that management of land and water can provide are sometimes referred to as 'ecosystem services'. These have been subdivided into four types that together represent the main benefits that define our overall quality of life:

- provisioning services, such as agriculture and forestry which provide food and timber;
- regulating services, such as filtration of water flowing across the landscape that helps modify and control water quality and the risk of flooding;
- cultural services, such as the existence of opportunities for recreation, aesthetic and spiritual activities; and, underlying these three a set of
- supporting services such as soil formation, pollination and photosynthesis.

In taking an Ecosystems Approach, the LUS pilot looks to promote the inclusion of all these services when considering options for land management to deliver multiple benefits at the catchment scale.

The LUS pilot is being led by Scottish Borders Council and having now produced the framework which guides different 'users' to make informed decisions, achieve their objectives more effectively and facilitate debate on conflicting demands, the next phase of the pilot will look to develop and implement its use within the Scottish Borders.

**Target 7.4.2** - Assist in the development and implementation of a Land Use Strategy decision-making tool to target work around the catchment.

The Ecosystem Approach (see section i.viii) to managing the natural environment is fast becoming a key management approach, with the publication of the Scottish Land Use Strategy marking an important step in putting theory into practice. The Scottish Land Use Strategy (LUS) published in 2011 has the aim of achieving a more integrated approach to land management; in recognition of the increasing number of pressures and demands placed upon the countryside. Realising that delivering the aims of the Strategy at a local level would be key to effecting meaningful change, two regional pilots were created in 2013, one of which is hosted by Scottish Borders Council in partnership with Tweed Forum. The Phase 1 objective of the pilots was to produce a common flexible framework which will guide different 'users' to make informed decisions, achieve their objectives more effectively and facilitate debate on conflicting demands. Having created this framework, the next phase of the LUS pilot will look to develop and implement its use within the Scottish Borders.

**Objective 7.5****Ensure adequate commitment of time and resources to the CMP.****ISSUES**

Whilst Tweed Forum staff are regularly delivering CMP targets and actions, Tweed Forum staff alone will not be able to ensure the successful implementation of the CMP. Clear commitment of both time and resources from a wide range of organisations and individuals will be essential to achieve the objectives set out in the CMP.

**Target 7.5.1 – Secure resources to deliver actions identified in the CMP.**

The CMP offers stakeholders a more effective and integrated approach to management of the catchment's resources. In this sense, the process of implementing and developing the CMP should be seen as a tool to help agencies fulfil and add value to their existing statutory duties and practices. Many of the identified actions can be achieved by building on existing institutional and community capacities. However, some actions identified in the CMP will require financial resources and it will be important to be responsive to funding opportunities. A variety of resources will be required to enable the successful implementation and development of the CMP over time. These resources include financial resources as well as time, commitment and enthusiasm from a wide range of stakeholders. New skills training and new organisational capacities may also be required to enable stakeholders to learn and work together.

# Action Tables

<b>Strategic Aim 1: Water Quality</b>	
<b>KEY PARTNERS</b>	
<b>Objective 1.1</b> <b>Locate, investigate and address specific water quality problem areas within the catchment</b>	
Target 1.1.1 Investigate the causes behind failures to meet WFD/Bathing Water quality targets and draw up and implement action plans to ensure future compliance	
1.1.1.1 Continue to monitor and address the Bathing Water quality issue at Spittal Beach and draw up and implement action plans to ensure future compliance	EA
1.1.1.2 Continue investigations into BOD failures in the lower catchment on stretches of the Till and Wooler water	EA
1.1.1.3 Continue to address priority catchments and encourage take-up of relevant SRDP 2014-2020 schemes	SEPA, TForum
<b>Objective 1.2</b> <b>Monitor, evaluate and address the impact of agriculture and forestry on water quality in the catchment</b>	
Target 1.2.1 Continue to reduce the impact of diffuse agricultural pollution on the surface and groundwater quality of the Tweed catchment	
1.2.1.1 Address those agricultural sectors that contribute most to diffuse agricultural pollution with targeted and coordinated action	EA, NE, NFUS, SEPA, SRUC
1.2.1.2 Continue to implement improved farm waste management through nutrient budgeting and other waste minimisation and efficiency measures, where possible	EA, NFUS, SEPA, SRUC
1.2.1.3 Continue to promote the use of wetland filtration systems and swales to treat farm steading run-off	EA, NE, NFUS, SEPA, SRUC, TForum
1.2.1.4 Increase awareness and promote action amongst farmers of practical ways to reduce diffuse pollution, highlighting the potential economic savings that can be made	EA, NE, NFUS, NWT, RSPB, SEPA, SRUC, TForum
1.2.1.5 Continue to reduce the effect of nitrates on groundwater in the nitrate vulnerable zone (NVZ) through improved nutrient budgeting	EA, NFUS, NWT, SEPA, SRUC
1.2.1.6 Increase awareness of both statutory and non-statutory diffuse pollution codes of practice	EA, NE, SEPA, TForum
Target 1.2.2 Minimise the potential of agrochemicals and sheep dips to degrade water quality	
1.2.2.1 Raise awareness amongst the farming community of the potential effects of sheep dips and other agrochemicals on water quality and associated ecology	EA, NFUS, SEPA, SRUC
1.2.2.2 Raise awareness of the legislative requirements surrounding the use of agrochemicals	EA, NFUS, SEPA, SRUC
1.2.2.3 Where necessary increase monitoring activity to determine the impact of agrochemical and sheep dip incidents on water quality and associated ecology	EA, SEPA
Target 1.2.3 Continue to reduce the potential of forest management activities to adversely affect water quality in the catchment	
1.2.3.1 Encourage compliance with the 'Forest and Water Guidelines' by all sectors of the forestry industry	EA, FCS, SEPA

**Objective 1.3****Minimise the impact of residential and industrial development on the water quality of the catchment**

<b>Target 1.3.1 Promote and extend the use of sustainable surface water management systems such as Sustainable Urban Drainage Systems (SUDS)</b>	
1.3.1.1 Survey, map and assess SUDS currently operating in the catchment	SBC, NCC, SEPA
1.3.1.2 Develop and disseminate best practice guidance notes for developers and regulators	EA, NCC, NW, SBC, SEPA, SW
1.3.1.3 Raise awareness of the statutory requirements for and benefits of SUDS	EA, NCC, NW, SEPA, SW
1.3.1.4 Investigate and eliminate existing contamination sources in industrial estates	EA, NW, SEPA, SW
<b>Target 1.3.2 Ensure discharges from waste water treatment works and septic tanks do not contribute to the deterioration of water quality</b>	
1.3.2.1 Review and set discharge consents at appropriate levels to protect and where appropriate enhance water quality	EA, SEPA
1.3.2.2 Identify and improve those WWTPs and discharges that are currently having a detrimental impact on water quality	EA, NW, SEPA, SW
1.3.2.3 Raise awareness of the maintenance requirements of sewage treatment systems	EA, NCC, NW, SEPA, SW
1.3.2.4 In the context of local authority development plans, agree a prioritised programme for upgrading waste water treatment plants in the catchment	EA, NCC, NW, SEPA, SW

**Strategic Aim 2: Water Resources****KEY PARTNERS****Objective 2.1****Consider the needs of the environment alongside those of all other water users**

<b>Target 2.1.1: Ensure flows in the rivers and burns of the Tweed catchment meet the requirements of riverine, riparian and wetland species and habitats</b>	
2.1.1.1 Address, via CAMS or CAR, those areas within the catchment where low flows are having a detrimental ecological impact	EA, NE, SEPA, SNH, SW, TFn
2.1.1.2 Where necessary, carry out additional ecological and hydrological research and monitoring to help determine ecologically acceptable flow regimes for the catchment	EA, NE, NWT, SEPA, TForum, TFn
<b>Target 2.1.2: Reduce the impact of surface and groundwater abstractions on riverine, riparian and wetland ecology</b>	
2.1.2.1 Survey, map and where possible quantify abstractions from the Tweed and its tributaries	EA, NE, RTC, SEPA, SW
2.1.2.2 Seek reductions in abstractions where negative environmental impact is found	EA, NE, SEPA, TForum
2.1.2.3 Explore demand management and storage measures which encourage water conservation and reduce overall abstraction volumes	EA, NE, NW, SEPA, SW
2.1.2.4 Assess the potential impact of land use changes on flows and undertake monitoring as required	NCC, SEPA
2.1.2.5 Determine the impact of groundwater abstraction on groundwater levels and establish means to minimise the pressures on falling groundwater levels	EA, NW, SEPA, SW

**Target 2.1.3: Continue to review reservoir release regimes to minimise ecological impacts and ensure more natural hydrological conditions**

2.1.3.1 Continue to incorporate physical, hydrological, biological and fisheries data into management decision frameworks	SEPA, SNH, TFn
2.1.3.2 Continue to review current decision making processes and monitoring systems regarding reservoir releases	RTC, SEPA, TForum
2.1.3.3 Continue to disseminate information on the timings and volumes of reservoir releases to agreed parties	SEPA, TForum
2.1.3.4 Continue to publish data annually on how well reservoir releases have met legal requirements	SEPA, SW, TForum

**Strategic Aim 3: Habitats And Species****KEY PARTNERS****Objective 3.1****Ensure access to data on riverine, wetland and riparian habitats and species to inform sustainable management practices****Target 3.1.1 Continue to gain knowledge of the extent, status and distribution of riverine, riparian and wetland habitats**

3.1.1.1 Digitally map current and historical wetland sites and use this to target restoration programmes	BFT, EA, FCS, NE, NWT, RSPB, SBC, SEPA, SLE, SNH, TForum
3.1.1.2 Digitally map current riparian habitat restoration work and use this to inform future work and establish habitat networks	BFT, EA, FCS, NE, NWT, SBC, SEPA, TFn, TForum
3.1.1.3 Identify priority areas of riverine, riparian and wetland habitats that require protection and restoration	BFT, EA, NE, NWT, RSPB, SBC, SEPA, SLE, SNH, TFn, TForum
3.1.1.4 Support stakeholder access to, and awareness of, relevant data sources	SEPA, TForum

**Target 3.1.2 Improve knowledge and understanding of species of conservation interest**

3.1.2.1 Review data on all priority species and assess the need to commission further survey and monitoring work	EA, NE, NNPA, NWT, RSPB, EA, NE, NNPA, NWT, RSPB, SBC, SNH, TForum
3.1.2.2 Coordinate all existing and incoming species data referenced to the river and river corridor and encourage participation of local experts and recorders to achieve this	EA, NE, NNPA, NWT, RSPB, SBC, SNH, TFn, TForum
3.1.2.3 Ensure that monitoring of designated species and habitats of the River Tweed SAC/SSSI is used to inform future management	EA, FCS, NE, NWT, SNH, TFn
3.1.2.4 Continue monitoring and research programmes for salmon, brown trout, sea trout and other local fish species as set out in the Tweed Fisheries Management Plan	FBAA, RTC, TFn

**Objective 3.2****Promote the restoration of ecosystems, ecosystem function and ecosystem services****Target 3.2.1 Encourage the strategic development of habitat networks throughout the catchment, linking riparian, floodplain, wetland, upland and native woodland habitats**

3.2.1.1 Monitor and evaluate the outcomes of sub-catchment habitat network projects	BFT, EA, FCS, SBC, SNH, TFn
3.2.1.2 Using the Borders Woodland Strategy tools, promote 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 scale	BFT, EA, FCS, SBC, RSPB, SLE, SNH, SUP, TForum

<b>Target 3.2.2 Encourage the retention and expansion of wetlands and natural ponds to safeguard and enhance ecosystem services</b>	
3.2.2.1 Ensure that Local Development Plan policy reflects the importance of wetlands and ponds and the planning process encourages the inclusion of ponds and wetlands in landscape development	EA, NCC, NNPA, NWT, RSPB, SBC, TForum
3.2.2.2 Raise awareness of the importance of wetland sites with appropriate interpretation and guided walks for the public and schools	BFT, EA, NE, NNPA, NWT, RSPB, SBC, SNH, TForum
3.2.2.3 Promote and encourage agricultural practices, which maintain, enhance and create wetland areas and ponds	EA, NE, NFUS, NNPA, NWT, RSPB, SRUC, SBC, TForum
<b>Target 3.2.3 Develop and implement a wetland and riparian habitat strategy to inform future management</b>	
3.2.3.1 Encourage reduced stock numbers in riparian areas and where appropriate exclude stock to minimise erosion and retain/re establish bankside vegetation	BFT, EA, NE, NNPA, NWT, RSPB, SBC, SNH, SUP, TFn, TForum
3.2.3.2 Periodic review of the management of habitat enhancement sites to produce a mosaic of habitats	BFT, EA, NE, NNPA, NWT, RSPB, SBC, SUP, TFn, TForum
3.2.3.3 Encourage management of riparian habitats in urban areas and encourage community participation in such schemes	BFT, EA, NCC, NE, NWT, SBC, SNH, SUP, TForum
<b>Target 3.2.4 Conserve and enhance the fisheries of the Tweed catchment</b>	
3.2.4.1 Implement monitoring of fish stocks, habitat availability and exploitation rates as per the Tweed Fisheries District Management Plan	RTC, TFn
3.2.4.2 Implement fisheries habitat improvement programmes on nursery and spawning streams	RTC, TFn, TForum
3.2.4.3 Continue to implement management policies as required to prevent overexploitation of fish stocks	FBAA, RTC
<b>Objective 3.3 Monitor and control the introduction and establishment of non-native riverine and riparian species and where appropriate control or eradicate established populations</b>	
<b>Target 3.3.1 Improve knowledge, understanding and awareness of the potential threats of non-native riverine and riparian species and the need to prevent their introduction</b>	
3.3.1.1 Identify and catalogue non native riverine and riparian species that currently pose a threat to the habitats and species of the Tweed catchment	EA, NE, SBC, SEPA, SNH, TFn, TForum
3.3.1.2 Continue research into the impact and control of non native species on the native habitats and species of the catchment	EA, NE, SBC, SNH, TFn, TForum
3.3.1.3 Carry out a publicity campaign to raise awareness of the potential threats posed by non-natives, measures to prevent their spread/introduction and methods of control	EA, NE, SBC, SNH, TForum, TFn
3.3.1.4 Review, and update when necessary, the 'Invasives Plants' leaflet containing information on threats, species identification and control methods	SBC, TForum
3.3.1.5 Promote the national RAFTS biosecurity planning process and support any local measures that contribute to this process	RTC, SBC, SEPA, TForum, TFn
<b>Target 3.3.2 Prevent, control and where possible eradicate priority non-native species</b>	
3.3.2.1 Continue to map the extent of Giant Hogweed and Japanese Knotweed and sources of invasion	SBC, SEPA, TForum
3.3.2.2 Continue with the coordinated catchment wide control programme for Giant Hogweed/Japanese knotweed	EA, NE, NW, SBC, SEPA, TForum, TFn
3.3.2.3 Explore novel methods for controlling invasive species and disseminate findings	SEPA, TForum

## Strategic Aim 4: Riverworks

### KEY PARTNERS

#### Objective 4.1 Improve understanding of the impact of riverworks and seek to address degraded stretches

##### Target 4.1.1 Improve knowledge of the hydrogeomorphology of the river system

4.1.1.1 Identify, collate and log all information currently available on the hydrogeomorphology of the river system	EA, NE, RTC, SBC, SEPA, TForum
4.1.1.2 Using historical information such as photographs, maps, remote sensing and logged events, establish past changes in river dynamics within the catchment	BFT, EA, SBC, SEPA, SNH, TForum

##### Target 4.1.2 Improve knowledge of current and historical riverworks throughout the catchment

4.1.2.1 Survey, catalogue, map and assess all current and historical riverworks throughout the catchment	EA, NE, RTC, SEPA, TForum, TFn
4.1.2.2 Develop, publish and disseminate a catalogue of riverworks best practice examples in the Tweed catchment with appropriate demonstration sites	EA, NE, RTC, SEPA, SNH, TForum, TFn

##### Target 4.1.3 To further promote best practice and strengthen provision of advice to anyone considering riverworks within the Tweed catchment

4.1.3.1 Ensure information on the legislative requirements surrounding riverworks, the competent authorities involved with their management as well as advice on when to carry out riverworks is available online	EA, NE, RSPB, RTC, SBC, EA, NE, RSPB, RTC, SBC, SEPA, SNH, TForum
4.1.3.2 Continue to offer advice on riverworks and provide demonstration sites	SBC, TForum
4.1.3.3 Raise awareness of the need to notify the relevant authorities of all riverworks	EA, NE, RTC, SBC, SEPA, TForum

##### Target 4.1.4 Identify the different groups involved in riverworks and develop suitable methods to engage, learn and raise awareness of management issues

4.1.4.1 Continue to raise awareness amongst anglers, fishery managers, riparian owners, ghillies, farmers, landowners and contractors operating within the catchment	EA, FBAA, RTC, SNH, TForum, TFn
4.1.4.2 Develop and implement appropriate training programmes for all those involved in managing riverworks	EA, SEPA

##### Target 4.1.5 Investigate and facilitate the restoration of priority waterbodies which are failing WFD targets due to physical condition

4.1.5.1 Prioritise those stretches of Tweed which are failing due to morphological pressures	EA, FCS, NE, SEPA, TForum
4.1.5.2 Facilitate restoration works, in partnership with relevant stakeholders, on priority stretches	EA, FCS, NE, SEPA, TForum
4.1.5.3 Support the delivery of physical condition improvement plans	TForum

**Objective 4.2****Work with regulatory bodies to ensure that riverworks processes are as streamlined and efficient as possible**

Target 4.2.1 Support the Controlled Activities Regulation (CAR) process to ensure transparent and effective regulation

4.2.1.1 Support measures to reduce duplication of effort which may occur during the CAR process	SBC, SEPA, TForum
4.2.1.2 Continue the riverworks group as a Forum for sharing best practice, disseminating guidance, discussing forthcoming work in the catchment and ensuring cross-border integration	EA, SEPA, TForum
4.2.1.3 Investigate possibility of river restoration being deemed permitted development under planning regulations, to avoid current duplication with CAR	SBC, SEPA, TForum

**Strategic Aim 5: Flood Management****KEY PARTNERS****Objective 5.1****Improve knowledge, understanding and awareness of flood management issues within the Tweed catchment**

Target 5.1.1 Identify the different groups involved in and affected by flood management in the catchment and develop suitable methods to educate and raise awareness

5.1.1.1 Update, as necessary any resources (e.g. <a href="http://www.floodlinescotland.org.uk">www.floodlinescotland.org.uk</a> ) that assist the public in preparing for floods, including useful contacts and information sources	EA, SBC, SEPA, TForum
5.1.1.2 Promote 'Floodline' as a means of obtaining up to date information on flood risks and river levels	EA, SBC, SEPA
5.1.1.3 Disseminate clear information to residents on what to do before, during and after a flood	EA, SBC, SEPA

Target 5.1.2 Deliver the strategic flood risk management planning process required under the Floods Directive

5.1.2.1 Work closely with relevant partners to jointly agree priorities and actions for implementation in the first planning cycle (2016 - 2022)	SBC, SEPA, TForum
5.1.2.2 Support cross-border working between agencies and local authorities via the Flood Risk Management cross-border advisory group	EA, SBC, SEPA, TForum

**Objective 5.2****Encourage Sustainable Flood Management, where appropriate**

Target 5.2.1 Protect the floodplain from inappropriate development

5.2.1.1 Ensure development plans afford due weight to flood risk issues	EA, SBC, SEPA, TForum
5.2.1.2 Develop a framework for the integrated and open consideration of all new floodplain development proposals throughout the catchment	EA, SBC, TForum
5.2.1.3 Ensure that flood risk maps are used to enable better planning decisions to avoid unnecessary development in flood risk areas	EA, SBC, SEPA, TForum

<b>Target 5.2.2 Pursue opportunities for Natural Flood Management (NFM)</b>	
5.2.2.1 Continue to create floodplain habitats to alleviate flooding risks, allowing the natural functioning of the floodplain	BFT, EA, NWT, RSPB, SBC, TForum
5.2.2.2 Disseminate and, where appropriate, implement NFM approaches that help slow down flow and increase water retention	BFT, EA, RSPB, SBC, SEPA, TForum
5.2.2.3 Monitor/assess NFM activities in the catchment and disseminate findings	EA, NE, SBC, SEPA, TForum
5.2.2.4 Continue efforts to establish or enhance riparian and floodplain woodland	BFT, EA, FCS, RSPB, SBC, TForum
<b>Target 5.2.3 Ensure all flood protection schemes respect the physical, ecological and aesthetic integrity of the river system</b>	
5.2.3.1 Work with relevant partners to ensure that flood protection schemes are carried on a catchment scale basis	EA, RSPB, SBC/FLAG, SEPA, TForum
5.2.3.2 Ensure all flood protection schemes are developed in relation to other ecological plans to ensure schemes do not exacerbate flooding elsewhere or have a detrimental ecological impact	EA, RSPB, SBC/FLAG, SEPA, TForum
5.2.3.3 Ensure all flood protection schemes incorporate natural flood management elements where appropriate	SBC, SEPA, TForum
<b>Target 5.3.1 Ensure land management practices do not adversely impact on flooding frequency and intensity</b>	
5.3.1.1 Ensure Forests and Water Guidelines recommendations to reduce the impact of forestry activity on flooding intensity and frequency continue to be based on current science	FCS, RSPB, SBC
5.3.1.2 Encourage relevant stakeholders to input to forest design plans and forest restructuring plans to maximise flood attenuation opportunities	SBC, SEPA, TForum
5.3.1.3 Continue to build knowledge base on the effect of different land uses on flood flows	BFT, EA, FCS, RSPB, SBC, SEPA, TForum

## Strategic Aim 6: Tourism And Recreation

### KEY PARTNERS

#### Objective 6.1

**Support tourism and recreation activities which promote good practice, deliver multiple benefits and do not come into conflict with other aims and objectives set out in this document**

<b>Target 6.1.1 Promote responsible access by all river users</b>	
6.1.1.1 Encourage safe, responsible use of the water resource through the promotion of the Scottish Outdoor Access code and the Countryside Code for England	EA, SNH
6.1.1.2 Encourage adoption of the National Canoeists Code of Conduct developed by the Scottish Canoe Association	RTC, TForum, VSB
6.1.1.3 Encourage adoption of the RTCs Tweed Angling Codes	RTC, VSB
<b>Target 6.1.2 Ensure that water users acknowledge and respect each other's rights and responsibilities</b>	
6.1.2.1 Address the potential need for mediation between anglers and canoeists and where feasible develop formal agreements and disseminate widely	FBAA, RTC, TForum
6.1.2.2. Raise awareness of the risk posed by recreation in the spread/introduction of non native species	EA, NE, RTC, SNH, TFn, TForum

**Objective 6.2**

**Promote and establish tourism and recreational activities based on the built, natural and cultural heritage of the Tweed and its tributaries**

Target 6.2.1 Increase educational and interpretation facilities based on the built, natural and cultural heritage of the Tweed and its tributaries at appropriate sites

6.2.1.1 Continue to identify further interpretation opportunities in the catchment	NNPA, SNH, TForum, TFn
6.2.1.2 Support the provision of environmental education in the Tweed catchment	NNPA, SEPA, SNH, TForum, TFn

Target 6.2.2 Support tourist and recreational activities based in and around the Tweed and its tributaries, which aid the sustainability of the local economy

6.2.2.1 Maintain and promote Tweed as a world class angling destination	FBAA, RTC, TFn, VSB
6.2.2.2 Improve the brown trout and coarse fishing resource	FBAA, RTC, TFn
6.2.2.3 Encourage nature based tourism based on the Tweed and its tributaries	NNPA, RSPB, SNH, SUP, TForum, VSB
6.2.2.4 Continue to facilitate conservation of the built and cultural heritage associated with the river	NE, SBC, TForum, VSB

Target 6.2.3 Encourage the enhancement and expansion of the access network in and around the Tweed and its tributaries where it does not come into conflict with other objectives set out in this document

6.2.3.1 Maintain and develop the local path network with due regard for other interests	AF, NNPA
6.2.3.2 Promote all multipurpose routes that are centred on the river	AF, VSB
6.2.3.3 Improve signage and promotion of the local path network	AF, NNPA

**Strategic Aim 7: CMP Delivery And Development**

**KEY PARTNERS**

**Objective 7.1**

**Continue to ensure effective stakeholder engagement and interaction**

Target 7.1.1 Ensure opportunities for ongoing involvement and engagement with the CMP and the RBMP process

7.1.1.1 Establish opportunities for stakeholders to learn together to address issues raised	EA, SEPA, TForum
7.1.1.2 Ensure wide dissemination of all information relating to the CMP using a variety of media including the project web page	EA, SEPA, TForum

Target 7.1.2 Develop a learning approach to the decision-making, development and delivery of the CMP and RBMP to ensure effective implementation

7.1.2.1 Improve the skills base and capacity amongst stakeholder groups to enable them to collectively address issues raised in the CMP and RBMP process	EA, SEPA, TForum
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**Objective 7.2**

**Overcome institutional barriers affecting the delivery and development of the CMP**

Target 7.2.1 Continue to seek ways of streamlining our approach to the cross-border nature of water resource management in the Tweed catchment

7.2.1.1 Ensure Tweed Forum continues to enable different stakeholders to meet and engage with each other	TForum
7.2.1.2 Continue to improve cross-border communication through the work of Tweed Forum and where necessary develop additional opportunities	TForum

<b>Objective 7.3</b> <b>Review and monitor the effectiveness of the CMP</b>	
Target 7.3.1 Review and monitor the CMP at 6 yearly intervals	
7.3.1.1 Carry out reviews as appropriate of CMP actions, engaging all stakeholders involved in implementation activities	SEPA, TForum
7.3.1.2 Update the CMP and ensure new issues, actions and targets are incorporated where appropriate	SEPA, TForum
7.3.1.3 Prioritise, programme and cost, where appropriate, CMP actions and use this information to inform the Working Groups/Project Steering Groups	TForum
7.3.1.4 Continue to service the Working Groups/Project Steering Groups and progress the priority actions in the CMP work programmes and RBMP	SEPA, TForum
7.3.1.5 Tweed Forum to review research needs and identify gaps	TForum
<b>Objective 7.4</b> <b>Ensure the CMP integrates with other relevant plans and processes</b>	
Target 7.4.1 Ensure key elements of other plans and processes are integrated into the CMP	
7.4.1.1 Ensure CMP process dovetails with the objectives of RBMP and Flood Planning process to avoid duplication of effort	EA, SEPA, TForum
7.4.1.2 Use WFD classification/objectives, the flood planning process and the Land Use Strategy to target activity within the catchment	EA, SBC, SEPA, TForum
7.4.1.3 Embed the RBMP Measures Delivery planning process into each stage of CMP development and delivery	SEPA, TForum
7.4.1.4 Continue to scrutinise emerging plans and processes, where appropriate, and integrate with the CMP	TForum
Target 7.4.2 Assist in the development and implementation of a Land Use Strategy decision-making tool to target work around the catchment	
7.4.2.1 Work with Scottish Government and relevant stakeholders to explore how SRDP could be modified to deliver multiple benefits	SBC, TForum
7.4.2.2 Create subcatchment pilots to demonstrate how the Land Use Strategy approach can be delivered	SBC, TForum
7.4.2.3 Raise awareness of the Land Use Strategy and assist land managers with decision-making	SBC, TForum
<b>Objective 7.5</b> <b>Ensure adequate commitment of time and resources to the CMP</b>	
Target 7.5.1 Secure resources to deliver actions identified in the CMP	
7.5.1.1 All Tweed Forum members to identify opportunities and partners to fund CMP implementation activities	All partners
7.5.1.2 All Tweed Forum members to identify where activities in the CMP action plan help meet statutory obligations	All partners
7.5.1.3 All Tweed Forum members to identify and build upon existing institutional and community capacities to deliver actions set out in the CMP	All partners
7.5.1.4 Be open and responsive to emergent opportunities, which enable delivery of the CMP	All partners

# Appendices

## Appendix 1: Acronyms/Abbreviations

AAG	Area Advisory Group	PEPFAA	Preventing Environmental Pollution from Agricultural Activity
AF	Access Forum	PVA	potentially vulnerable area
BFT	Borders Forest Trust	RAFTS	Rivers and Fisheries Trusts of Scotland
BOD	biological oxygen demand	RBMP	River Basin Management Plan
CAMS	Catchment Abstraction Management Strategy	RHS	River Habitat Survey
CAR	Controlled Activities Regulations	RSPB	Royal Society for the Protection of Birds
CMP	Catchment Management Plan	RTC	River Tweed Commission
CRoW	Countryside and Rights of Way Act	SAC	Special Area of Conservation
CSF	Catchment Sensitive Farming	SBC	Scottish Borders Council
Defra	Department for the Environment Food and Rural Affairs	SEPA	Scottish Environment Protection Agency
EA	Environment Agency	SFM	sustainable flood management
EU	European Union	SLE	Scottish Land & Estates
EMS	European Marine Site	SNH	Scottish Natural Heritage
FBAA	Federation of Border Angling Associations	SRDP	Scottish Rural Development Programme
FCS	Forestry Commission Scotland	SRUC	Scotland's Rural College
LBAP	Local Biodiversity Action Plan	SSSI	Site of Special Scientific Interest
LUS	Land Use Strategy for Scotland	SUDS	sustainable urban drainage systems
MiMAS	Morphological Impact Assessment System	SUP	Southern Uplands Partnership
NCC	Northumberland County Council	SW	Scottish Water
NE	Natural England	CMP	Tweed Catchment Management Planning Initiative
NFM	natural flood management	TFn	Tweed Foundation
NFUS	National Farmers Union (Scotland)	UNESCO-HELP	UNESCO Hydrology for the Environment, Life and Policy
NGO	non-governmental organisation	UWWD	Urban Waste Water Directive
NNPA	Northumberland National Park Authority	VSB	Visit Scotland (Borders)
NVZ	nitrate vulnerable zone	WANE	Wildlife and Natural Environment (Scotland) Act 2011
NW	Northumbrian Water	WFD	Water Framework Directive
NWT	Northumberland Wildlife Trust		

## Appendix 2: Glossary of Terms

### **Abstraction**

The removal of water from a source of supply which includes surface or groundwater.

### **Alien Species**

A species accidentally or purposefully introduced to an area where it did not formerly occur. Often they have undesirable effects on native species and the ecological integrity of the native ecosystem.

### **Biodiversity**

The range of living organisms in an area which includes the variability among living organisms.

### **Biosecurity**

Measures taken to minimise the risk of introducing alien/invasive species into a given ecosystem.

### **Buffer Zone**

A strip of vegetated land adjacent to the watercourse which can reduce the levels of silt, nutrients and other pollutants reaching the watercourse and can also improve habitat quality.

### **Catchment**

A geographic area of land defined by the drainage of a river and its tributaries.

### **Catchment Management Abstraction Strategy**

CAMS are strategies for management of water resources at a local level. They make more information on water resources and licensing practice publicly available and allow the balance between the needs of abstractors, other water users and the aquatic environment to be considered in consultation with the local community and interested parties.

### **Catchment management planning**

A process whereby the different administrative, planning and regulatory systems and multiple demands on a river catchment are integrated and a consensual plan of action is formulated.

### **Compensation release**

A continuous release of water from a reservoir or dam, which compensates the downstream river needs.

### **Croy**

Man made riverworks, often stone or concrete, which can be used to improve fisheries and offer bank protection.

### **Culvert**

A drain that crosses under a road or railway.

### **Designated area**

An identifiable unit of land or water often with an associated legally binding mandate, that requires specific management practices to adequately protect important resource values, habitats or species.

### **Diffuse pollution**

Pollution that cannot be traced to a single, identifiable source.

### **Ecosystem Approach**

The Ecosystem Approach is a concept that integrates the management of land, water and living resources and aims to reach a balance between three objectives: conservation of biodiversity; its sustainable use; and equitable sharing of benefits arising from the utilisation of natural resources. It is the primary implementation framework of the Convention on Biological Diversity.

### **Ecosystem services**

The benefits or services that people obtain from ecosystems e.g. food, water supply, oxygen from plants, nutrient recycling.

### **Eutrophication**

The sometimes natural but often human induced process of nutrient enrichment resulting in high organic production rates. It produces several undesirable effects including algal blooms and seasonably low oxygen levels.

### **Fisheries management plan**

A plan to achieve specified management goals for a fishery, typically includes an assessment of the fishery followed by management prescriptions.

### **Flood protection schemes**

Structures that are erected to protect houses and other developed areas from flooding.

### **Floodplain**

Flat land, bordering a stream or river, onto which a river in flood will spread.

### **Freshet**

A one off compensatory release of water from a dam or reservoir often used to freshen up the river or encourage migratory fish to move upstream.

## Appendix 2: Glossary of Terms - *contd.*

### **General Binding Rules**

Part of the Controlled Activities Regulations, these rules represent the lowest level of control and cover specific low risk activities by requiring a statutory baseline of good practice.

### **Habitat networks**

A configuration of habitat that allows species to move and disperse through a landscape.

### **Hydrogeomorphology**

The study and science of fluvial landforms and the processes that form them.

### **Indicative flood risk maps**

Maps developed by the Environment Agency and SEPA to provide an overview of flood risk areas.

### **Indigenous**

A plant or animal originating naturally in a region.

### **Invasives**

Species of plants or animals that have been transported, with human aid, beyond the limits of their native geographic ranges. They often displace indigenous species and can reach pest status.

### **Natural flood management**

Managing those 'natural' riverine processes which assist in the alleviation of flooding by restoring, rehabilitating or safeguarding as necessary.

### **Point source pollution**

Pollution that is traceable to a single, discrete source.

### **Potentially vulnerable area**

Areas identified by SEPA where significant flood risk exists or is likely to occur, in accordance with the Flood Risk Management (Scotland) Act.

### **Riparian**

Being of, or on, the riverbank.

### **Riparian zone**

This zone will generally include the watercourse and the area affected by the watercourse to a distance of some 10 metres either side of the river bank.

### **Riverworks**

Temporary or permanent works that artificially modify the river bed, banks or in-stream morphology of a watercourse.

### **River Basin Management Plan**

Arising from the river basin planning process, this document sets out how the water environment within each district should be managed to achieve WFD requirements over a six year period. The plan sets out what needs to be achieved for all the water bodies in the district and will also specify measures or actions to achieve those objectives.

### **River basin planning process**

Arising from the EU Water Framework Directive, this process involves integrated management at the 'river basin' or catchment scale with the aim of sustainable water use.

### **Salmonid**

General term used for fish of the trout and salmon family.

### **Special Area of Conservation (SAC)**

An area designated under the European Habitats Directive which has a legally binding mandate to ensure protection of notified habitats and species.

### **Sustainable development**

Development that meets the needs of the present generation without compromising the ability of future generations to meet their needs.

### **Sustainable flood management**

A catchment based approach with the emphasis on 'soft' engineering, rather than 'hard' engineering, solutions to flooding issues.

### **Water Order**

A legal agreement enabling the abstraction of water for public water supply.





Tweed Forum, South Court,  
Drygrange Steading,  
Melrose, Roxburghshire TD6 9DJ



01896 849 723



[info@tweedforum.org](mailto:info@tweedforum.org)



[www.tweedforum.org](http://www.tweedforum.org)

*Editors: Nicola Bissett and  
Luke Comins*