The **Northumberland Rivers** Catchment Abstraction Management Strategy

September 2003

Environment Agency

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1 Introduction

The vision for the Northumberland Rivers Catchment Abstraction Management Strategy (CAMS) is to ensure that there is water available for abstraction while protecting the needs of the natural environment. The Environment Agency will achieve this by ensuring the quantities allowed for future abstraction do not compromise the needs of the natural environment.

Catchment Abstraction Management Strategies (CAMS) are strategies for management of water resources at a local level. They will 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.

CAMS are also the mechanism for managing time-limited licences by determining whether they should be renewed and, if so, on what terms.

Managing Water Abstraction: The Catchment Abstraction Management Strategy Process is the national document that supports the development of CAMS at a local level. It sets out the national policy and the regulatory framework within which CAMS operate, describes the process of developing CAMS, and provides information on the structure and content of CAMS documents. This CAMS should be read in conjunction with *Managing Water Abstraction.*

The Northumberland Rivers CAMS sets out how much water is available in the catchment and the Environment Agency's preferred options for managing this water now and in the future. The Northumberland Rivers CAMS is the first of four CAMS to be produced in the Northumberland, Tyne and Wear and County Durham area. CAMS is a rolling programme and the Northumberland Rivers CAMS will be reviewed in six years time.

A Technical Document (final version) for the Northumberland Rivers CAMS has been produced which provides the detailed technical information on which the development of the strategy has been based. If you wish to receive this document on CD-ROM, please contact the Environment Agency at the address below. A hard copy version of the document is also available for viewing at the same office.

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2 Consultation on the Northumberland Rivers CAMS

Consultation is an integral part of the CAMS process. It is important because it ensures that the CAMS process is as transparent as possible and gives everyone the opportunity to get involved. For the Environment Agency (hereafter referred to as the Agency) to manage water resources in a catchment effectively and sustainably, it is important that as much information as possible is collated on water needs and uses. Comments and suggestions have been gathered during the early stages of development of this strategy through various pre-consultation activities. These were:

- an awareness raising leaflet
- a CAMS stakeholder group
- targeted information requests

The leaflet was distributed in September 2001. Its aim was to raise awareness of the development of the CAMS in the local area and it also invited anyone with an interest to send in written comments, providing information, views and suggestions for consideration during the early development of the CAMS.

A stakeholder group has been set up for the Northumberland Rivers CAMS. The role of the stakeholder group is to represent the key interests in the catchment and to help identify issues of local significance, provide views on proposals and to consider the likely implications of different strategy options. The members of the Northumberland Rivers CAMS stakeholder group and the interests they represent are as follows:

D L Nicholson:	Chairperson
D Brookes:	Representing local council
I Brown:	Representing agriculture
V Brown:	Representing recreation
R Hall:	Representing conservation
M Huttly:	Representing water company interests
J Jackson:	Representing angling
S Rankin:	Representing industry (previously A Foord)

Additional information has been gathered through the targeted information request process. Its aim was to request specific information relating to the Northumberland Rivers CAMS area from relevant sources. These included Northumbrian Water Limited for sewage treatment works returns and water treatment works returns, the County Archaeologist from Northumberland County Council for archaeological sites in the area, and the National Land Management team from DEFRA for agricultural and land use information.

There was also a formal consultation on the Northumberland Rivers CAMS through a Consultation Document, distributed in November 2002. The responses received were analysed and taken into account as the strategy was finalised. This CAMS document now sets out the final strategy that has been determined for the Northumberland Rivers CAMS area.

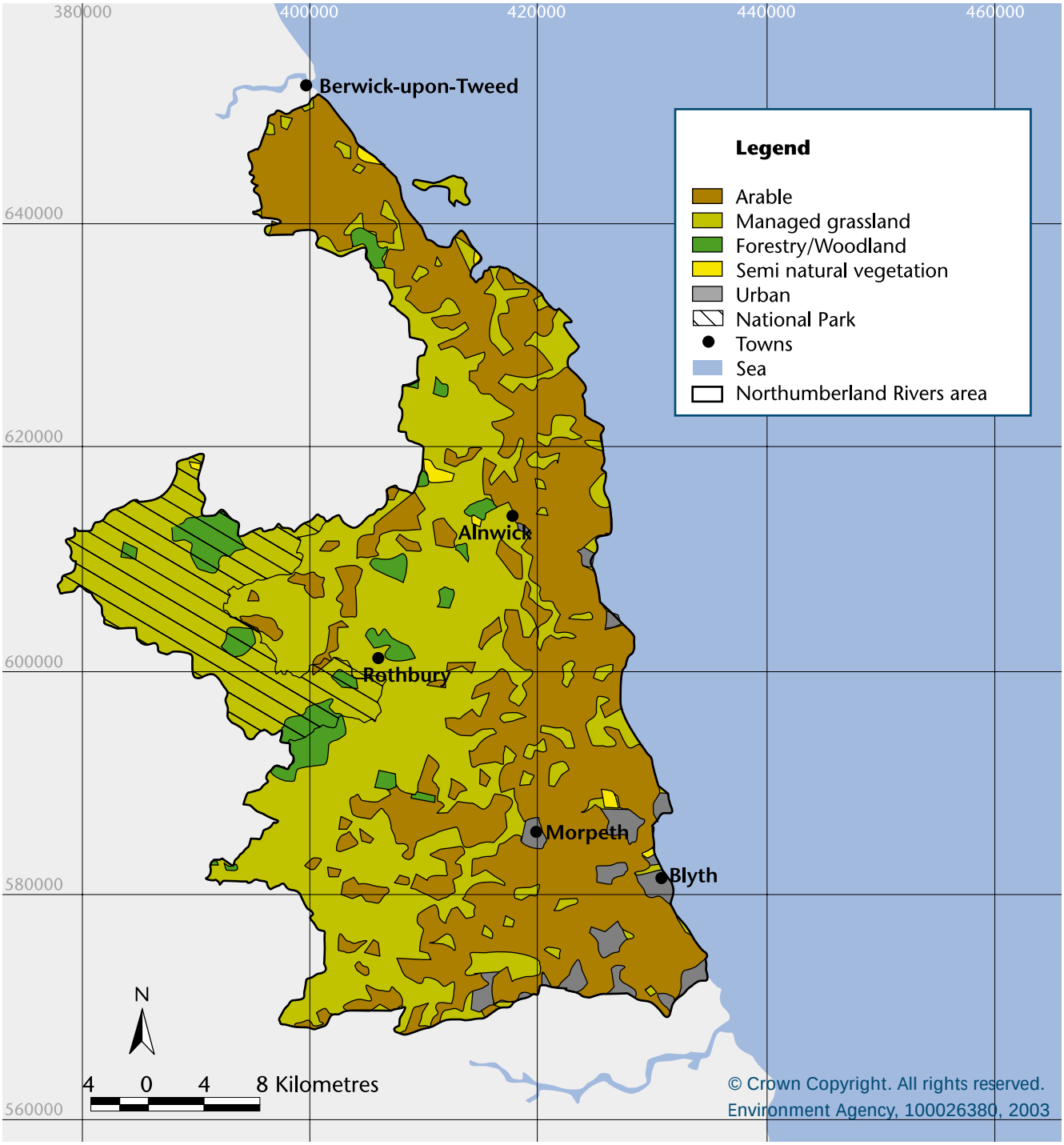
3 The Northumberland Rivers CAMS area

This section contains background information on the Northumberland Rivers CAMS area. More detail can be found in the Northumberland Rivers CAMS Technical Document.

The Northumberland Rivers CAMS area encompasses approximately 2790km^2 north of Newcastle upon Tyne and includes the towns of Alnwick, Rothbury, Morpeth and Blyth. Refer to Map 1.

The area is predominantly rural with much of the land area used for agriculture, namely arable and managed grassland, shown on Map 2. The area includes the catchments of the Rivers Blyth, Pont, Wansbeck, Font, Lyne, Coquet and Aln. The area extends from the heights of the Cheviot Hills in the west, down through the Northumbrian Fells to the Coastal Plains in the east.

Map 1. Northumberland Rivers CAMS area overview



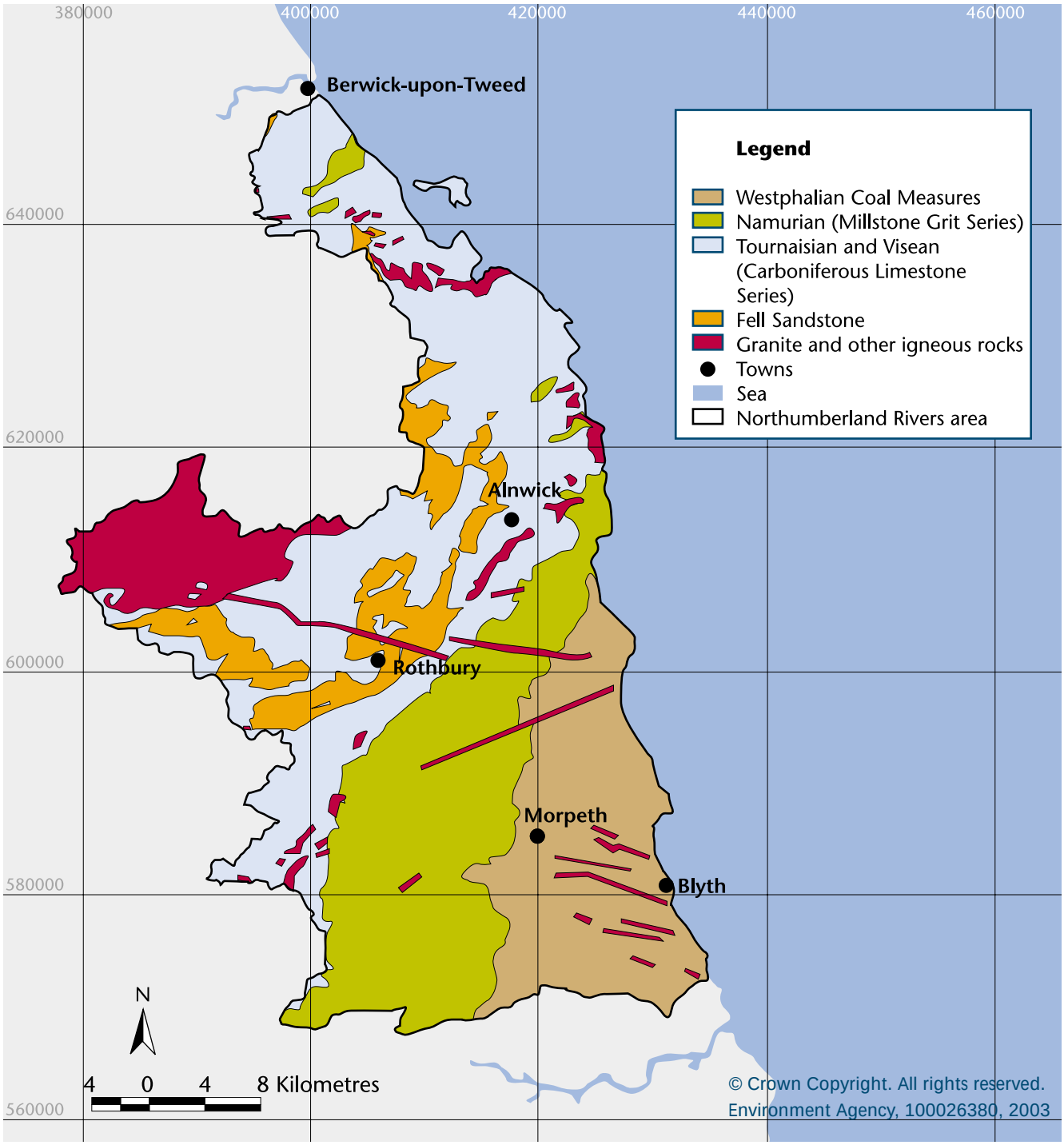
Map 2. Land use of the Northumberland Rivers CAMS area

3.1 Hydrology and climate

A large extent of the Northumberland Rivers CAMS area lies in the coastal plain where there is little variation in precipitation. Annual totals range from 1400mm on the Cheviot Hills, to 850mm in the south west of the area, to a little under 600mm near the coastal strip. The plain is drained by numerous rivers and small streams, principally the Rivers Aln, Coquet, Wansbeck, Font, Blyth, Pont and Lyne.

3.2 Geology and hydrogeology

The geology of the Northumberland Rivers CAMS area consists of igneous and sedimentary rocks, with the oldest rocks to the north west and progressively younger rocks to the east and south east. Glacial drift deposits overlie much of the area. The area is dominated by rocks of Carboniferous age (between 360 to 286 million years old). Carboniferous rocks are largely sequences of alternating sandstones, shales, limestones and coals of varying thickness. Many of the coal seams throughout the area have been mined to some extent.



Map 3. Geology of the Northumberland Rivers CAMS area

The major aquifer in the Northumberland Rivers CAMS area is the Fell Sandstone, as shown on Map 3. The Fell Sandstone produces a ridge of higher ground from Berwick upon Tweed extending southwards towards Rothbury then westwards towards Kielder. The major rock type is permeable sandstone with pebbly and impermeable bands. Impermeable siltstones act as barriers to groundwater flow. The sandstone has strong vertical jointing which extends to a considerable depth and greatly aids the permeability of the rock mass. Due to the steep topography and fractured and faulted nature of the rock, the sandstone releases stored groundwater in the form of springs. The sandstone is capable of supporting large abstractions, but the majority of these large abstractions lie outside the Northumberland Rivers CAMS area. There are some important water supply springs in the Rothbury area.

Minor aquifers seldom produce large quantities of water but may be important for local supplies. The Middle Limestone, Upper Limestone and Millstone Grit are classed as minor aquifers. The thicker limestones and sandstones are the source of numerous springs. These springs are widely used for rural private water supply, as are many small boreholes. Springs and groundwater provide baseflow to the rivers.

Map 4. Gauging stations in the Northumberland Rivers CAMS area

There are few monitoring boreholes in the Northumberland Rivers CAMS area which measure groundwater levels, therefore information is limited.

3.3 Hydrometry

River flows are measured using a network of gauging stations. These gauging stations are listed in Table 1 (period of record available in brackets) and shown on Map 4. For the period of flow statistics used in this assessment refer to the Northumberland Rivers CAMS Technical Document.

3.4 Abstractions and discharges

There are a total of 78 abstraction licences in the Northumberland Rivers CAMS area. The distribution of surface water and groundwater abstractions is shown on Map 5. Abstraction and discharge data used in this assessment were taken from the period 1995 to 2003. Figure 1 shows that public water supply is the dominant use of abstracted water in the area, comprising 79.8% of the total licensed quantity for the area. A much smaller proportion is abstracted for industrial and commercial use, spray irrigation and domestic and agricultural purposes.

Table 1 | Gauging stations in the Northumberland Rivers CAMS area

Gauging Station Key	Gauging Station Name	River
1	Stamfordham (1999- present)	Pont
2	Hartford Bridge (1968- present)	Blyth
3	Hawkhill (1966-1980)	Aln
4	Mitford (1969- present)	Wansbeck
5	Rothbury (1973- present)	Coquet
6	Morwick (1964- present)	Coquet
7	Bygate (1957-1980)	Coquet
8	Shillmoor (1957- present)	Usway Burn
9	Clennell (1969-1982)	Alwin
10	Waren Mill (1999- present)	Waren Burn

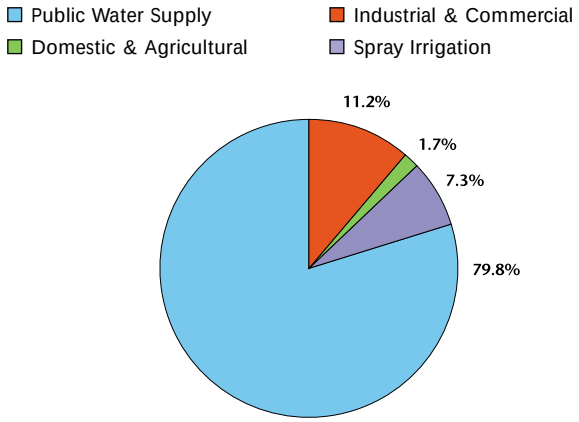


Figure 1 | Percentage of quantities licensed for abstraction for different uses in the Northumberland Rivers CAMS area

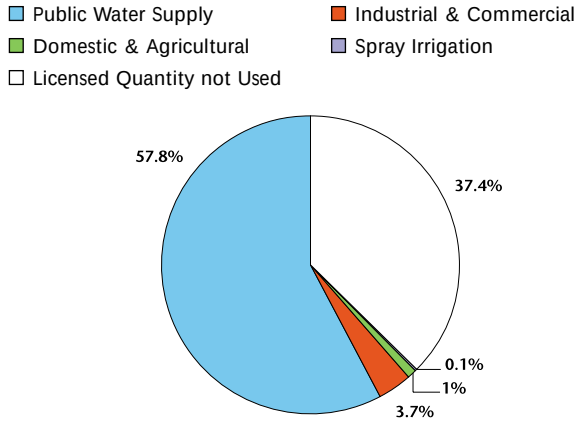


Figure 2 | Percentage of licensed quantities actually abstracted for different uses in the Northumberland Rivers CAMS area

Figure 2 shows that only 62.6% of the quantity of water licensed to be abstracted is actually taken on an average year. In particular, the quantity actually abstracted for public water supply is considerably less than the quantity licensed. In a normal to wet summer, when it may not be necessary to irrigate crops, the amount abstracted for spray irrigation is considerably less than the licensed quantity.

The largest proportion of water licensed for abstraction within the Northumberland Rivers CAMS area is from the River Coquet catchment, 59% of the total licensed quantity, as shown in Figure 3.

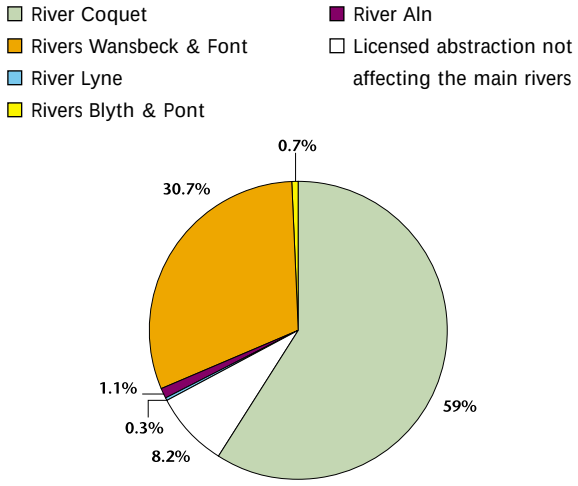
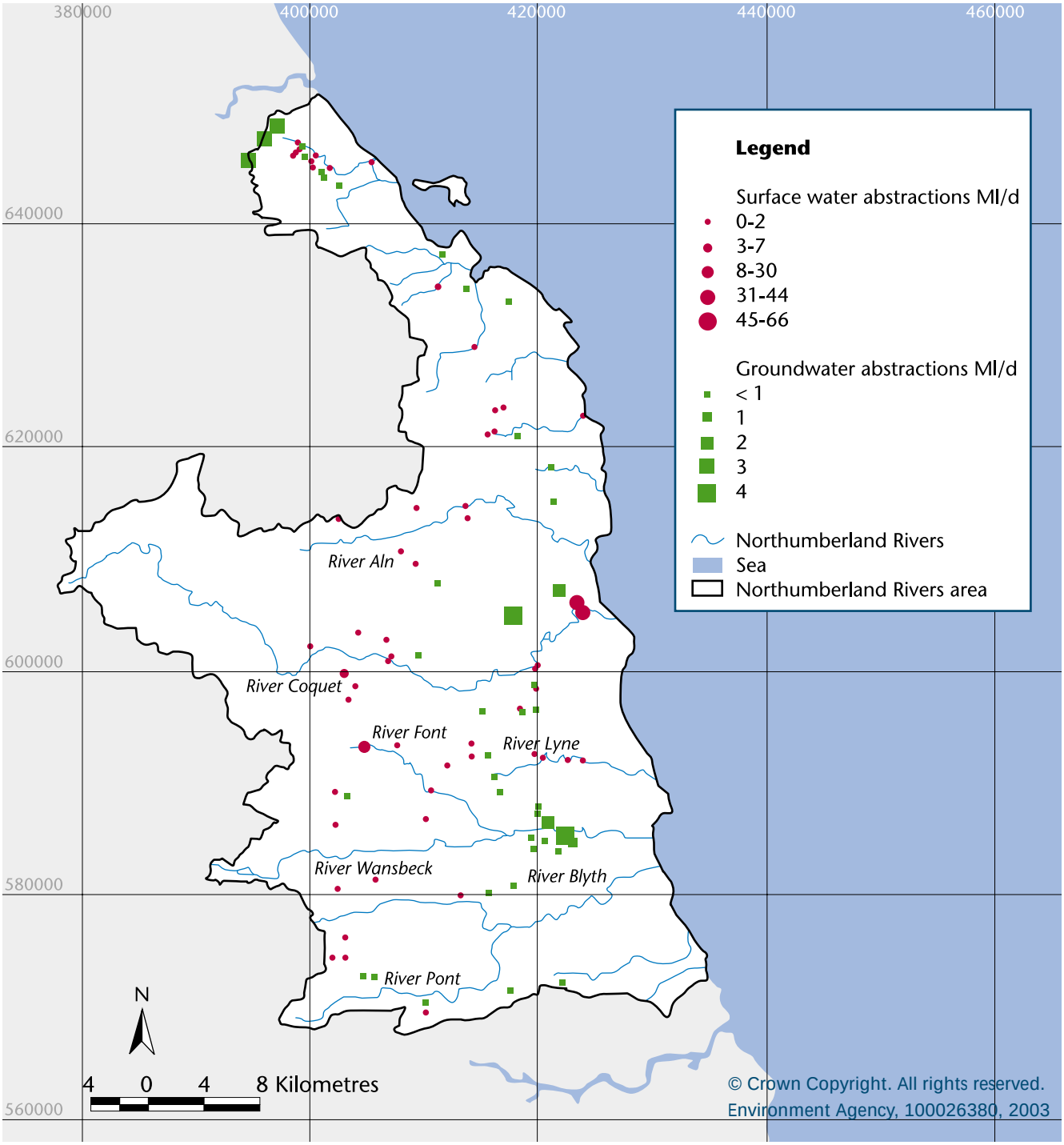


Figure 3 | Percentage of quantities licensed for abstraction from each river assessed in the Northumberland Rivers CAMS area

Due to the rural nature of the Northumberland Rivers CAMS area, there are no major industrial discharges. The larger discharges are from sewage treatment works serving large towns in the Northumberland Rivers CAMS area. Refer to Map 6.



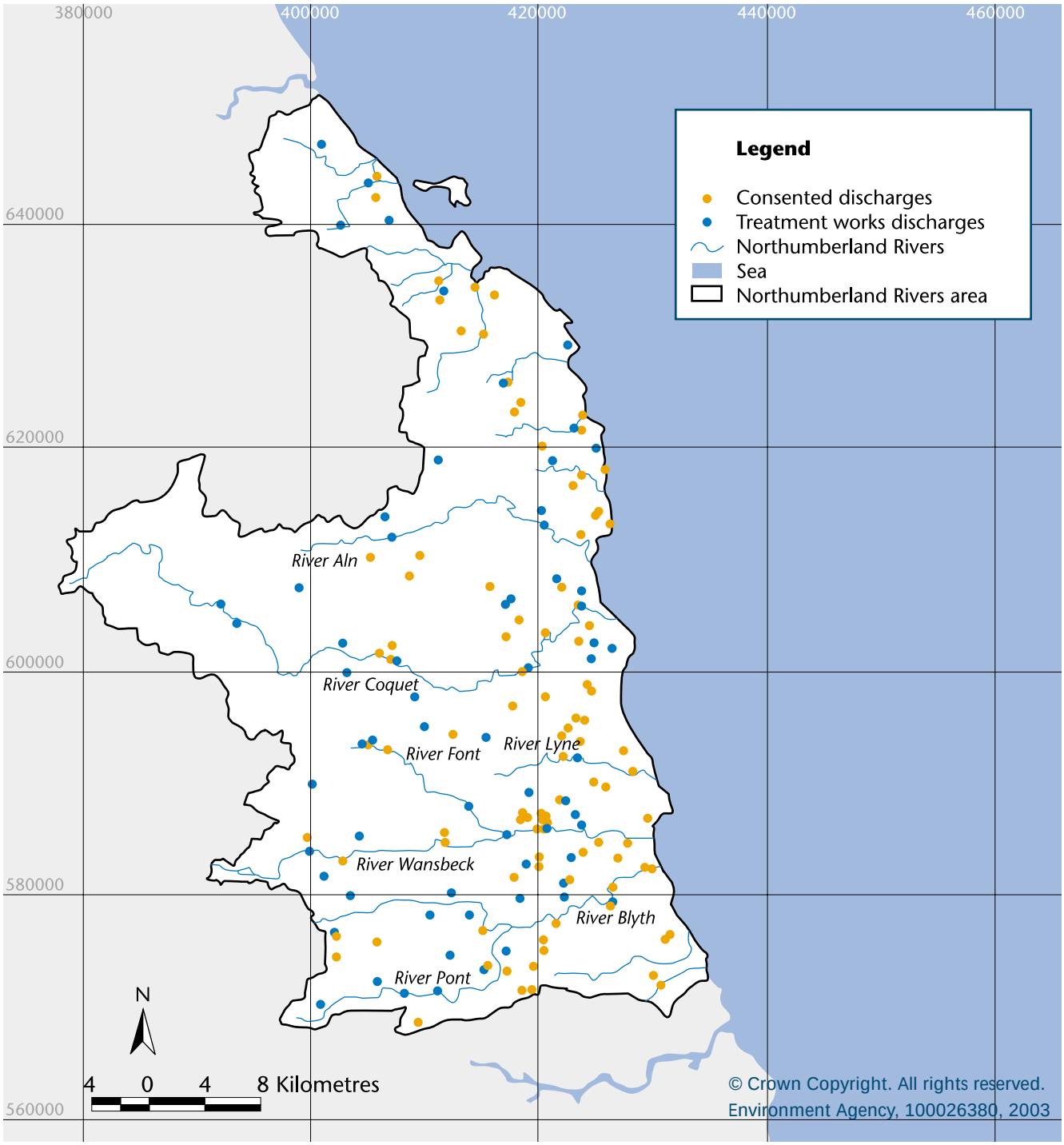
Map 5. Surface water and groundwater abstraction licences in the Northumberland Rivers CAMS area

3.5 Conservation and designations

The Northumberland Rivers CAMS area contains a wide diversity of habitats ranging from tranquil coastal beaches to pristine river environments. The area is of high conservation value with a number of designated sites, shown on Map 7.

The Natura 2000 network is a series of sites designated under the European Habitats and Birds Directive. These sites are afforded a very high level of protection under European Law. Two types of sites are designated; Special Areas of Conservation (SAC), which contribute to biodiversity by maintaining and restoring habitats and species, and Special Protection Areas (SPA) which provide protection to birds, their nests, eggs and habitats. The UK Government has forwarded a list of candidate SACs to the European Commission as a proposed contribution to Natura 2000.

Ramsar sites are areas of international conservation importance which are mainly designated for their bird populations and often cover similar areas to SPAs. Map 7 shows that most of these designated sites are located along the coast.



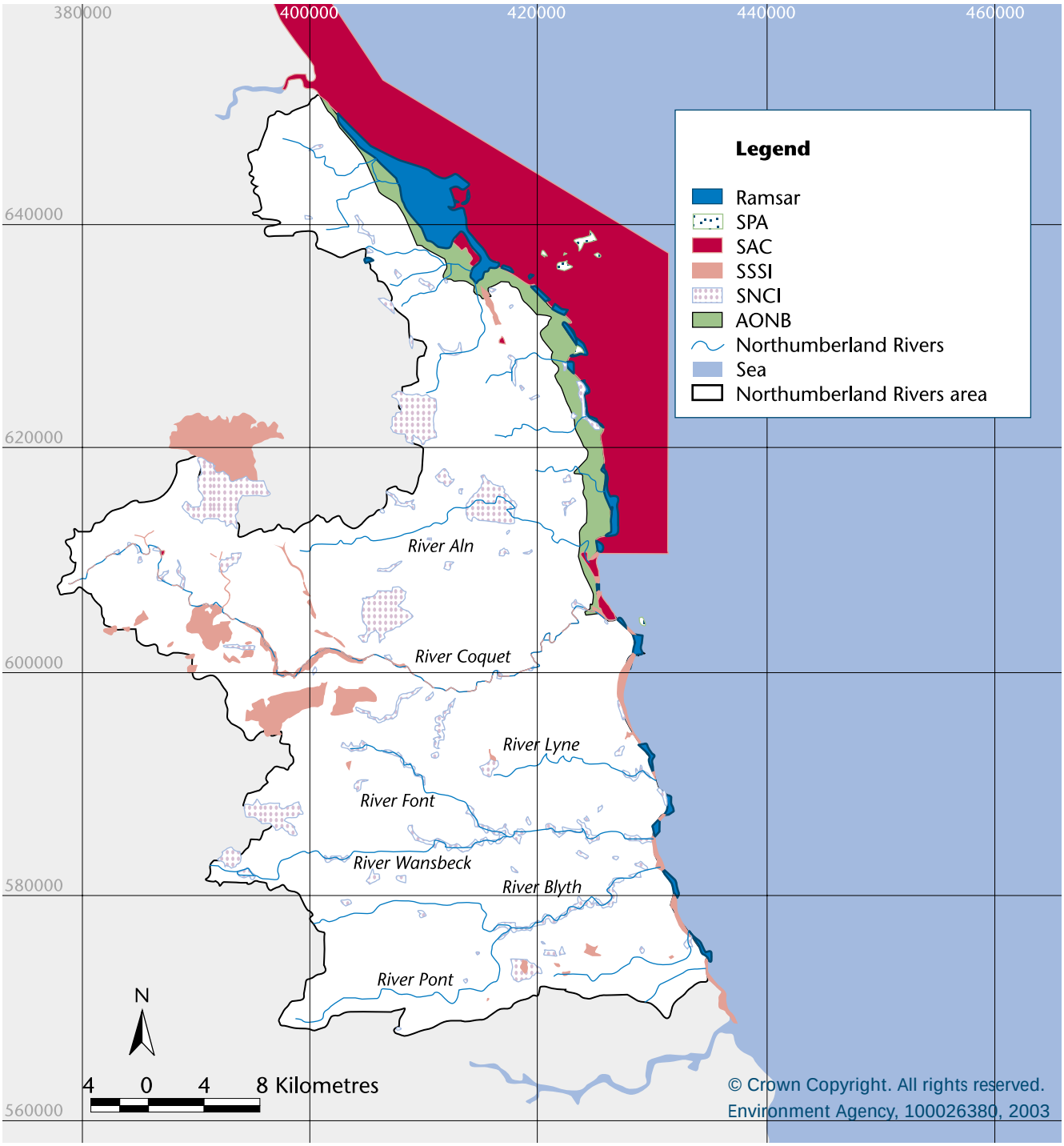
Map 6. Discharge consents in the Northumberland Rivers CAMS area

In addition to the Natura 2000 sites there are also many important Sites of Special Scientific Interest (SSSI). As a result of its diverse wildlife, particularly freshwater plants, the River Coquet is designated as a SSSI. Within the River Blyth catchment, SSSIs include Prestwick Carr, notified for its invertebrates and its fen and lowland raised mire habitats and Holywell Pond, notified as a good example of a subsidence pond and for whooper swans. In the catchment of the Seaton Burn, Big Waters has been notified as a good example of a subsidence pond with reed swamp and fen. It is also important for invertebrates, breeding birds, roosting swallows, wintering wildfowl and marginal plant communities.

A large proportion of the coastline in the Northumberland Rivers CAMS area includes designated sites such as the Northumberland Shore SSSI and the Warkworth and Alnmouth dunes and saltmarsh SSSIs.

Under the European Habitats Directive, the Agency is required to complete a review of licences and consents. The Agency has not identified any licenced abstractions or discharges which adversely affect the aforementioned sites.

The UK was one of 150 countries, which signed the Biodiversity



Map 7. Designations in the Northumberland Rivers CAMS area

Convention at the Earth Summit in Rio in 1992. The Convention required the development of national strategies, plans and programmes for the conservation of biological diversity. In the UK, this has been done through the UK Biodiversity Action Plan (BAP). Under this plan the Agency and water companies will conserve and, where practicable, enhance biodiversity with regard to national or local targets. A number of UK BAP species are recorded within the Northumberland Rivers CAMs area. They include the water vole, otter, lamprey, native crayfish and river jelly lichen. No changes to the use of water resources have been identified as being necessary to promote or protect these species.

There are also a number of archaeological sites / finds within the Northumberland Rivers CAMS area and there is the possibility of yet undiscovered sites within the area. Archaeology and archaeological sites have been taken into consideration in the Sustainability Appraisal section of the Northumberland Rivers CAMS (full appraisals can be found in the Northumberland Rivers CAMS Technical Document). Additionally the licence determination process includes archaeological checks within it, to ensure preservation and protection of such sites.

3.6 Ecology and fisheries

The Agency collects and analyses a large amount of ecological information. The data collected can give an indication of problems related to abstraction and water quality. This data has been used to guide the assessment of water resource availability for the Northumberland Rivers CAMS.

3.6.1 River Aln

The River Aln is of high conservation and ecological value. The river is used regularly by otters with occasional records of otters breeding in the catchment. There are also native crayfish found in various places along the length of the river. The River Aln has long been regarded as a sea trout river, with relatively low numbers of salmon reported annually by anglers. Brown trout are found throughout the catchment and are introduced for angling purposes in the lower reaches. Upstream of the obstruction at Little Ryle, wild brown trout thrive in high densities. The biological quality of the River Aln is generally good.

3.6.2 River Coquet

The River Coquet is one of the best known migratory fisheries in northern England. Salmon, sea trout and wild brown trout are present throughout most of the river system. The River Coquet is one of the few rivers where all three species of lampreys spawn and these species are protected under the EC Habitats Directive. The River Coquet is one of the few rivers where river jelly lichen is found. This species is protected under the Wildlife and Countryside Act 1981. The biological quality of the River Coquet is good throughout.

Salmon spawning grounds on the River Coquet

3.6.3 River Wansbeck and River Font

Good riparian habitats and the relatively undisturbed nature of the rivers have allowed a thriving otter population to become established. The River Wansbeck supports a healthy breeding population of native crayfish in the upper tributaries and down to the tidal limit. The River Wansbeck has developed predominantly into a brown trout fishery as a consequence of the available habitat, stocking activities and the management practices of riparian owners and angling clubs. A small run of sea trout and salmon enter the river every year. The biological quality of the River Wansbeck and its main tributaries, including the River Font, is good.

3.6.4 River Lyne

The River Lyne is not generally regarded as a fishery of sport value although brown trout are present in small numbers. Minor species, including minnows and sticklebacks, form the majority of the fish population. The biological quality of the River Lyne has improved significantly over the past few years and now ranges from fairly good to good. This is due to improvements at the sewage treatment works and new operating procedures at the opencast coal sites.

3.6.5 River Blyth and River Pont

The lower and middle reaches of the Rivers Blyth and Pont support a healthy and diverse plant community with an associated fauna. The native crayfish has been found in the upper reaches of the Rivers Blyth and Pont and their associated tributaries. Sightings of otters have been occasionally reported on the Rivers Blyth and Pont and their presence has been confirmed in recent surveys. The majority of the freshwater reaches within the River Blyth catchment are of good biological quality.

The River Blyth and its tributaries support populations of coarse fish and eels. No salmon have ever been recorded by the Agency and the juvenile trout densities are generally low by comparison with other similar river systems, although this is not thought to be abstraction related. The River Pont also supports a population of grayling in addition to brown trout.

Bridge over the River Blyth

3.7 Water quality

Due to the rural nature of the Northumberland Rivers CAMS area, the chemical water quality of its rivers is generally very good. Due to the small extent of industrial and urban development in the area, any adverse water quality effects from consented discharges are minor and very localised. There are only a couple of stretches that fail to meet their river quality objectives, but these failures are not linked to water abstraction.

3.8 Tourism and recreation

Tourism and recreation are important to the economy of Northumbria, particularly in rural areas and along the coast. Recreation may be of an informal type, such as walking beside water, viewing the scenery and enjoying the flora and fauna, or it may actively involve water, for example, rowing, sailing and canoeing.

The Agency has a duty to promote the use of water and land associated with water for recreation and to take recreation into account in the performance of all its functions. The Agency can also pass bylaws for purposes connected with carrying out its functions.

Visitors are attracted to the unspoilt countryside and spectacular coastline. The most popular activity of visitors to the Northumberland Rivers CAMS area is walking. Favourite places are along the coastline, on the banks of rivers and around the Cheviots and Simonside Hills.

Angling is a popular recreational activity in the Northumberland Rivers CAMS area with many rivers supporting salmon, brown trout and sea trout.

Canoeing is practised on inland stretches including the Rivers Coquet, Wansbeck and Aln. The coast supports all forms of recreational boating including yachting, sailing and motor cruising.

Angler on the River Coquet

3.9 Links with other plans

The Agency and other organisations have responsibility for various plans and initiatives, which are linked to the management of water resources. Those most directly linked to CAMS are described below. Further details on these and other initiatives are provided in the Northumberland Rivers CAMS Technical Document.

The Agency has just finished consulting on its draft corporate strategy *Local Contributions: Making it Happen.* This is the plan for delivering the Agency's vision over the five years from 2002 to 2007. The Northumberland Rivers CAMS contributes to some of the key targets to improve and protect inland and coastal waters:

- to establish CAMS for all catchments by 2008
- to characterise and quantify pressures and impacts on all surface waters and groundwater sources

CAMS considers the sustainability of abstraction on a local scale, but is not a means for resolving abstraction issues at specific sites. This is the role of the Restoring Sustainable Abstraction Programme, which is a prioritised plan for investigating sites which it is believed may be affected by abstraction and taking action to remediate them where appropriate. There are no such sites in the Northumberland Rivers CAMS area.

In general, the Agency aims to improve river habitats and increase diversity and populations of particular species, for example under the BAP process (see also section 3.5).

On a larger scale, the Agency's national and regional Water Resource Strategies consider overall water demand and supply.

The North East Water Resources Strategy (*Water Resources for the Future*, March 2001) focuses on the state of water resources at a strategic scale and explores options for their long term sustainable development. The Northumberland Rivers CAMS builds on this work by carrying out a more detailed local assessment of water resource use and availability. This has resulted in reviewed water availability status for the Upper Coquet and the River Font. Further information is provided in the Northumberland Rivers CAMS Technical Document.

Each water company produces a Water Resources Plan, setting out its view on how it will manage water resources for public supply over the next 25 years. In addition, Drought Plans are produced by both the Agency and water companies and are updated annually. These outline specific measures to be implemented in time of drought, having regard to environmental impacts and water resource availability. The water companies also produce investment plans that balance supply and demand, including planning for new sources and making environmental improvements. This happens through the Asset Management Planning process, which is described in more detail in the Northumberland Rivers CAMS Technical Document.

4 Resource assessment and resource availability status

4.1 Introduction

To manage water resources effectively, the Agency needs to understand how much water is available and where it is located. This is achieved by undertaking a resource assessment, covering both surface water and groundwater.

Water is used for a number of different purposes, the principal categories being general agriculture, spray irrigation, industrial use, power generation and water supply. For each different use, the amount of water that is returned to the water environment close to where the water was abstracted may vary considerably. Where this loss is high, the Agency considers the abstraction to be consumptive. This may restrict the availability of water for these purposes, unless a significant proportion of the water abstracted is returned to the water source close to the point of abstraction.

To easily provide information on the availability of water resources within a catchment that may be used for consumptive purposes, a classification system has been developed. This 'resource availability status' indicates the relative balance between committed and available resources, showing whether licences are likely to be available and highlighting areas where abstraction needs to be reduced. This does not replace the need for the licence determination process which is applied to licence applications. More information on the determination process is given in *Managing Water Abstraction* (Annexe 2).

There are four categories of resource availability status, as shown in Table 2.

So that water resources are assessed consistently in similar situations, a framework for resource assessment and management to be applied in all CAMS areas has been developed.

This framework involves the development of an understanding of the water resources of the CAMS area and an assessment of the surface water and groundwater resource. These results are integrated to define the final resource availability status of different units within the CAMS area.

Within and between catchments there are variations in characteristics. In order to measure, manage and regulate effectively, the Agency needs to break catchments down into smaller areas, recognising similarities in characteristics. These areas are known as Water Resource Management Units (WRMUs). In the resource assessment for CAMS, in areas where groundwater resources are significant, Groundwater Management Units (GWMUs) are defined. For surface water, 'Assessment Points' (AP) are located on the river network. Each AP represents the catchment that drains into it. These river APs and GWMUs are the focus of resource assessment and abstraction licensing. As there are few groundwater abstractions in the Northumberland Rivers CAMS, there are no GWMUs.

Table 2 | Resource availability status categories

Indicative resource availability status	Definition	Colour coding for illustration on maps
Water available	Water likely to be available at all flows including low flows. Restrictions may apply.	Blue
No water available	No water available for further licensing at low flows although water may be available at higher flows with appropriate restrictions.	Yellow
Over-licensed	Current actual abstraction is resulting in no water available at low flows. If existing licences were used to their full allocation they would have the potential to cause unacceptable environmental impact at low flows. Water may be available at high flows with appropriate restrictions.	Orange
Over-abstracted	Existing abstraction is causing unacceptable environmental impact at low flows. Water may still be available at high flows with appropriate restrictions.	Red

Map 8. River Assessment Points in the Northumberland Rivers CAMS area

Map 8 shows the river APs that have been defined for the Northumberland Rivers CAMS. Further details on how these were defined are provided in the Northumberland Rivers CAMS Technical Document.

4.2 Resource assessment of Groundwater Management Units

There is little groundwater resource in the Northumberland Rivers CAMS area due to the absence of significant areas of major aquifer. Also, groundwater resources have not been developed to their potential due to the abundance of surface water resources. GWMUs have therefore not been identified in this area.

Unless investigations have proved otherwise, groundwater abstractions have been assumed to have the same impact on river flows as equivalent surface water abstractions. Spring abstractions have also been taken as surface water abstractions.

Map 9. Environmental Weighting bands for the Assessments Points in the Northumberland Rivers CAMS area

4.3 Resource assessment of Water Resource Management Units

The surface water resource assessment requires the definition of 'river flow objectives' at the AP. These are based on the sensitivity of the local ecology to flow variations (i.e. their vulnerability to abstraction impacts), upstream of the AP. It also takes account of other flow needs. These objectives represent the minimum flow that the Agency is aiming to protect. This then affects the amount of water that is available for abstraction.

These river flow objectives are developed by first giving 'Environmental Weighting' (EW) scores to the reaches which represent the sensitivity of the ecology of the river reach to abstraction. Reaches are banded A to E, with A being most sensitive to abstraction and E being the least sensitive. If there are different scores within a WRMU the most sensitive is selected to offer most protection to the environment.

Map 9 and Table 3 show the EW bands for each AP in the Northumberland Rivers CAMS area.

Table 3 | Environmental Weighting score

Assessment Point	Assessment Point Name	Environmental Weighting Score
1	River Aln	A
2	Lower Coquet	B
3	Upper Coquet	A
4	River Lyne	B
5	Lower Wansbeck	B
6	Upper Wansbeck	B
7	River Font	B
8	Lower Blyth	B
9	Upper Blyth	B
10	River Pont	A

These river flow objectives are compared with a scenario flow which assumes that all licences are being fully utilised (i.e. the full licensed quantity is being abstracted). This comparison reveals either a surplus, balance or deficit. The size of the surplus/deficit corresponds to a resource availability status for the WRMU.

The surface water resource availability status gives an indication of whether new licences will be available from the river or whether some recovery of resources is required. However, there are significant variations in flow throughout the year. A classification of 'over-licensed' or 'over-abstracted' generally indicates that no new licences will be granted. However, this applies only at times of low flow. During periods when flows are higher, there may be some water available for abstraction. The classification is therefore really a classification of resource availability at low flow.

Abstraction licences are sometimes managed in order to assure this flow variability is maintained by the use of 'hands-off flow' conditions. These are conditions on licences that require abstraction to cease, or reduce, when the flow in the river falls below a specified level. Therefore, when river flows are above this hands-off flow, abstraction can take place but when flows are below this, no abstraction, or reduced abstraction, can occur. Low flows will occur more frequently during the summer months.

In order to maximise abstraction while maintaining the variability of flow required for many aquatic species, a tiered system of hands-off flows is applied. This comprises of a series of Takes (proportions of water), which can be abstracted, according to prescribed hands-off flows. Licences are generally granted with the lowest hands-off flow possible i.e. within Take 1, on a first-come-first-served basis. As more licences are granted, the hands-off flow must be increased i.e. within Takes 2 and 3, to maintain sustainable flows in the river.

For potential applicants for new abstraction licences, it is therefore important to know not only the likelihood of obtaining a licence, but also the reliability of a licence if granted with a hands-off flow condition. Within the CAMS resource assessment, reliability is expressed as a percentage. This percentage indicates the minimum amount of time over the long term that the scenario flow exceeds the river flow objective, therefore allowing abstraction to take place.

The resource assessment for surface water has used a scenario which assumes that all licences are being fully used; that is, the authorised volume is being abstracted. However, many licences are not used fully and therefore in reality the resource availability can be different. If the result of a resource assessment is 'over-licensed', data of actual abstraction is then used to establish whether the status is 'over-abstracted' (actual flows are lower than river flow objectives). 'Over-abstracted' represents abstraction that is already unsustainable whereas 'over-licensed' represents the potential for damage should the full licensed amount be abstracted.

Map 10. Resource availability status of river reaches in the Northumberland Rivers CAMS area

4.4 Integration of the surface water resource assessments

The resource availability results for river reach assessment are integrated and iterations made, where necessary.

The preliminary results for a river reach may be overridden in order to protect a downstream river reach that has a worse low flow resource availability status than its own (here the downstream reach is known as the critical reach). Previously these overridden river reaches would have been assigned the same low flow resource availability status as that of the critical reach. This has caused confusion in some cases about where the actual effects of over abstraction are seen within the catchment and as a result the Agency have changed the way in which the low flow resource availabilty status of a river reach above a critical reach is overriden.

Where the preliminary low flow resource availability status of the river reach is 'water available' it is overridden to 'no water available' in order to indicate that additional abstraction will only be allowed where it does not make the position within the

critical reach any worse. Where the river reach is 'no water available', 'over licensed' or 'over abstracted' it maintains its own status. The strategy that is developed still takes into account the impact that any additional abstraction from these river reaches has on the critical reach or unit.

This means that the low flow resource availability status of the Upper Coquet has changed from the consultation document in order to fit with the new way in which we override the low flow resource availability status of a river reach above a critical reach. See Table 4. This has not changed the way in which we will manage these reaches.

Map 10 shows the resource availability status of river reaches in the Northumberland Rivers CAMS area. Further information on surface water assessments can be found in the Northumberland Rivers CAMS Technical Document.

predominantly rural catchment, only 1.1% is used for industrial and commercial purposes and there are no abstractions for public water supply. Water for public supply in this area comes mainly from the River Coquet. Of the total amount licensed from the River Aln WRMU, only 9% has actually been abstracted in recent years.

There are five small sewage treatment works, plus the larger Alnwick works, discharging an average of 2494m^3/d into the catchment.

After licensed abstraction is taken into account there is considerably more water remaining than required by the river flow objective.

The River Aln WRMU has been assessed as ***'water available'.***

Table 4 | Change in resource availability status for the Upper Coquet

Name of river reach	Preliminary low flow resource availability status	Final low flow resource availability status in Consultation Document	Final low flow resource availability status for the final CAMS Document
Upper Coquet	no water available	over licensed	no water available

4.5 Water Resource Management Units

The Northumberland Rivers CAMS area has ten WRMUs. The area has been divided into WRMUs according to the availability of hydrometric data, the distribution of abstractions and discharges and the distribution of major tributaries. WRMUs are shown on Map 11. WRMUs have not been designated for tidal sections, areas where there is little abstraction, and where there is insufficient hydrometric data. The following sections describe the results of the resource assessment for each WRMU.

4.5.1 Water Resource Management Unit 1: River Aln

The River Aln rises on the slopes of the Cheviot Hills and, with significant tributaries from the Northumbrian Fells, flows eastward to the sea. The area is predominantly rural, the largest town being the market town of Alnwick.

River flow statistics have been derived using historic data from Hawkhill gauging station, located just downstream of Alnwick. The River Aln WRMU is 250km^2. Although there are areas of Fell Sandstone aquifer (69km^2) in the WRMU, there are no large groundwater abstractions.

An average of 1190m^3/d is authorised for abstraction by nine abstraction licences in the River Aln WRMU. With the exception of one spray irrigation licence abstracting from the River Aln, abstraction is from springs and small boreholes.

Licensed abstraction in the River Aln WRMU amounts to only 1.1% of the total quantity licensed in the Northumberland Rivers CAMS area. Of the licensed quantity, 80% is for spray irrigation and 18% for domestic and agricultural use. Being a

The River Aln and Alnwick Castle

Map 11. Water Resource Management Units in the Northumberland Rivers CAMS area

4.5.2 Water Resource Management Units 2 and 3: Lower and Upper Coquet

The River Coquet rises on the southern flanks of the Cheviot Hills and flows eastward through the market town of Rothbury to the sea, a distance of around 70km and draining some 581km^2. The River Coquet flows through beautiful and diverse countryside and the whole of the river has been designated a SSSI.

The River Coquet has been split into two WRMUs, upstream and downstream of Rothbury gauging station. Flow statistics for the upper WRMU have been derived from Rothbury gauging station. Morwick gauging station has been used for the lower WRMU. The Fell Sandstone aquifer outcrops over 103km^2 in the River Coquet WRMUs, but there are few borehole abstractions. However, springs draining from the Fell Sandstone in the Rothbury area are used for public water supply, both locally and as far away as Tyneside.

There are 20 licensed abstractions in the two River Coquet WRMUs, three in the upper WRMU and 17 in the lower WRMU. There is one licensed saline abstraction from the estuary.

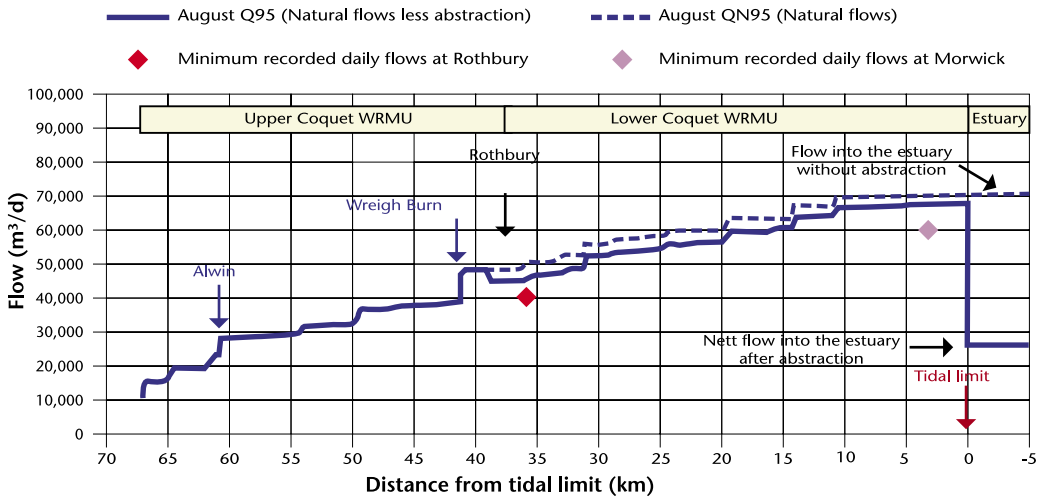


Figure 4 Profile of river flows in the Upper and Lower Coquet Water Resource Management Units in August

In the upper WRMU, upstream of Rothbury, the three abstraction licences authorise the abstraction of 6906m^3/d, the majority being from springs and used for public water supply. In the lower WRMU, the 17 licences authorise the abstraction of 54,903m^3/d, again, the vast majority being for public water supply. A total of 61,809m^3/d is therefore authorised to be abstracted from the two River Coquet WRMUs, 59% of the total quantity licensed in the whole of the Northumberland Rivers CAMS area. A total of 86.5% of this water is licensed for public water supply. Of the remaining licences, 7.4% is authorised for industrial and commercial use, 4.6% for spray irrigation and 1.6% for domestic and agricultural use.

Six sewage treatment works discharge an average 1929m^3/d. Some of the abstractions have associated discharges and these discharges have been allowed for when calculating the net abstraction quantities affecting river flows.

Figure 4 shows the profile of flows in August, on average, for the River Coquet inland from the estuary. The two lines on the graph show the flows in August, statistically the month with the lowest flows. The solid blue line is the actual flow in the river and includes the effect of the various actual abstractions and discharges. The August QN95 flow, the dashed blue line, shows what the natural flow in the river would be if there were no abstractions and discharges. The difference between the two lines is the net amount of water abstracted from the river after allowing for discharges back into the river.

Q95 and QN95 flows are flows that are exceeded for 95% of the time. This means that August Q95 and QN95, is the flow that, on average, is exceeded for a total of 29.5 days in that month. The two diamonds on the graph show the locations of the Agency's gauging stations and the lowest daily flows that have ever been recorded at these sites during summer droughts.

Figure 4 illustrates that for the River Coquet, net quantity actually abstracted above the tidal limit is quite small, less than 5% of low flows. In the upper WRMU, the flow taking into account the licensed abstractions and discharges fails to meet the river flow objective at the AP located at Rothbury gauging station for 7% of the time which is on average, 25.5 days per year.

The Upper Coquet WRMU has been assessed as 'no water available'.

The presence of the large abstraction licence at the tidal limit affects the resource availability status for the Lower Coquet WRMU, even though it does not affect the flows in the river above the tidal limit. In the lower WRMU, the total net quantity licensed for abstraction in the upper and lower WRMUs, and particularly the large abstraction licence at the tidal limit, results in the net licensed quantity failing to meet the river flow objective for 40% of the time.

The Lower Coquet WRMU has been assessed as ***'over licensed'.***

Figure 4 also shows the effect of the large abstraction at the tidal limit on fresh water flows into the estuary. If there were no abstractions, fresh water flows into the estuary during August would rarely fall below 70,000m^3/d. The abstraction at the tidal limit reduces this flow to 25,700m^3/d. These low fresh water flows into the estuary would occur, on average, for a total of only 1.5 days in August with higher flows for the remainder of the month. At higher flows the total amount of fresh water abstracted from the river is a relatively small proportion of the river flow. The larger abstractions from the river have been fairly constant for over 40 years and during this time, there have been no reports of adverse effects on the ecology of the estuary from reduced fresh water flows.

Whilst there have been no suggestions of problems in the estuary, to take a precautionary approach, the Agency would like the amount of abstraction to remain as it has been for the last 40 years so that, subject to appropriate resources being available, the freshwater requirements of the estuary may be further investigated.

The River Coquet estuary

4.5.3 Water Resource Management Unit 4: River Lyne

The River Lyne is a relatively small river, only 21km long. It rises just to the west of the A1 trunk road, north of Morpeth and flows eastward to the sea, draining 70km^2 of mainly low lying land in this part of the Northumberland Coastal Plain.

There are no gauging stations on the River Lyne and flow statistics have been derived using hydrological computer models.

The four abstraction licences in the River Lyne WRMU are all related to agriculture and total 335m^3/d. Spray irrigation licences amount to 87% of the total licensed quantity, but only 3% of the actual licensed quantity has been used in recent years. Licences in this small catchment make up only 0.3% of the total licensed quantity in the CAMS area.

The Coal Measures and old coal workings in the River Lyne WRMU are being de-watered to enable opencast and deep coal mining to continue. Whilst some of these discharges of minewater are to the sea, the flow of the River Lyne is increased by a large discharge of water pumped from a borehole to protect opencast coal workings. Without this discharge, there would be very little water available in the summer for abstraction from the river. Although the Agency cannot guarantee that the minewater discharge will be prevalent for the long term future, it has placed conditions on the licences on the River Lyne. These conditions allow abstraction only when the discharge is taking place.

After licensed abstractions and discharges are taken into account at the AP there is considerably more water remaining than required by the river flow objective.

The River Lyne WRMU has been assessed as '***water available'.***

Stobswood opencast coal site

4.5.4 Water Resource Management Units 5, 6 and 7: Lower Wansbeck, Upper Wansbeck and River Font

The River Font is the major tributary of the River Wansbeck. Both rivers rise on the high ground of central Northumberland. The River Font rises on the Fell Sandstone hills to the south of the River Coquet catchment but the Fell Sandstone only occupies 7km^2 of the total catchment area of 331km^2. The area is predominantly rural with the only large towns being the market town of Morpeth and the former mining town of Ashington nearer to the coast.

River flow statistics for the River Wansbeck have been obtained from Mitford gauging station near Morpeth and just downstream of the confluence with the River Font. There are no gauging stations on the River Font and flow statistics have been derived using hydrological computer models. Fontburn Reservoir dominates the flow regime in the River Font. The compensation release from the reservoir, plus the discharge from the associated water treatment works, is only slightly less than the estimated August low flow that would occur had the reservoir not been built.

An average of 35,613m^3/d is authorised for abstraction by 14 abstraction licences in the Rivers Wansbeck and Font WRMUs, two of which are for public water supply, by far the largest being from Fontburn Reservoir. Three of these abstractions are from boreholes (4455m^3/d), located in an area of the Coal Measures, which will be de-watered by pumping minewater to the sea to prevent flooding and pollution. These abstractions are therefore not considered to affect the flows in the River Wansbeck.

Licensed abstraction affecting river flows in the Rivers Wansbeck and Font WRMUs amounts to 30.7% of the total quantity licensed in the Northumberland Rivers CAMS area. Of the licensed quantity, 93.9% is for public water supply with only 4.4% for industrial and commercial use, 1.2% for spray irrigation and 0.5% for domestic and agricultural use. Of the total quantities licensed for abstraction, 57% has actually been used in recent years.

There are eight discharges into the River Wansbeck with the average totalling 5447m^3/d, of which the largest by far is from Morpeth

sewage treatment works. The only discharge into the River Font is the compensation release from Fontburn Reservoir.

Although the compensation release from Fontburn Reservoir is only slightly less than the estimated August low flows, the compensation release is constant and is much less than the flows that would occur at other times of the year were the reservoir not present. The reservoir is storing these higher flows for abstraction throughout the year. The River Font AP, located close to the confluence with the River Wansbeck, shows that the ecology of the River Font, at this location, is excellent. However, the Agency has little ecological data for the River Font upstream of the AP. Until such data can be collected, a precautionary approach is required.

The River Font WRMU has been assessed as ***'no water available'.***

The abstractions from the Upper and Lower River Wansbeck WRMUs are quite small. There are several discharges including the large discharge from Morpeth sewage treatment works. After licensed abstraction is taken into account there is considerably more water remaining than is required by the river flow objective.

The Lower Wansbeck and Upper Wansbeck WRMUs have been assessed as ***'water available'.***

Fontburn Reservoir

4.5.5 Water Resource Management Units 8, 9 and 10: Lower Blyth, Upper Blyth and River Pont

The River Blyth is a relatively small river just over 30km long with the River Pont being its main tributary. The River Pont WRMU starts at the discharge from the Whittle Dene aqueduct, just downstream from Matfen, and extends to the confluence with the River Blyth, a distance of 23km. The River Blyth drains a total of 290km^2, of which 141km^2 is drained by the River Pont.

Gauging records on the Rivers Blyth and Pont proved to be unreliable for producing flow statistics due to historically variable discharges from the Whittle Dene aqueduct. Accordingly, hydrological computer models have been used. These also proved to be subject to error and some adjustments to the data had to be made manually. More details on this can be found in the Northumberland Rivers CAMS Technical Document. The discharge from the Whittle Dene aqueduct is slightly more than the estimated natural August low flow and is essentially the same as a compensation release from a reservoir, being constant throughout the year.

There are 11 abstraction licences affecting river flows in the Rivers Blyth and Pont WRMUs, five in the River Blyth WRMUs and six in the River Pont WRMU, authorising an average abstraction of 759m^3/d. These licences authorise only 0.7% of the total for the Northumberland Rivers CAMS area. There are no public water supply abstractions; 10.1% is used for industrial and commercial purposes, 71.9% for spray irrigation and 18% for domestic and agricultural use. Of the total amount licensed for abstraction, only 15% has actually been used in recent years. There are two licensed abstractions which do not affect river flows. These are two boreholes, in an area of Coal Measures, which will be de-watered to prevent flooding and pollution by pumping minewater to the sea.

The River Pont

Of the 18 consented discharges, totalling an average of 1638m^3/d, nine are in the River Blyth WRMUs (752m^3/d) and nine are in the River Pont WRMU (886m^3/d).

After licensed abstraction is taken into account there is considerably more water remaining than required by the river flow objective.

The Lower Blyth, Upper Blyth and Pont WRMUs have been assessed as ***'water available'.***

4.5.6 Coastal streams and abstractions not included in the Water Resource Management Units

The small coastal streams, mainly in the northern part of the Northumberland Rivers CAMS area, are not included in a WRMU due to the rural nature of the area, the small number of abstraction licences and the lack of hydrological data.

Some groundwater abstractions are also not in WRMUs. Several large public water supply boreholes, although geographically within the Northumberland Rivers CAMS area, abstract from the Fell Sandstone aquifer and the effects of abstraction are within the Till CAMS area. Also, several boreholes abstracting from the Coal Measures have been excluded, as their abstractions do not affect river flows. These have been referred to above. All are located in areas of the Coal Measures, which will be de-watered by pumping minewater to the sea to prevent flooding and pollution. Estuaries are not included in any WRMU as it is not possible to assess the available resources.

There are 27 abstraction licences in the Northumberland Rivers CAMS area which are not included in a WRMU. These have a total authorised abstraction of 84,777m^3/d. This large amount is due mainly to saline abstractions. Of the remaining licences, 5745m^3/d is for industrial and commercial use, mainly from boreholes in the Coal Measures; 2574m^3/d for spray irrigation and 240m^3/d for domestic and agricultural use. Also the public water supply boreholes affecting the Till CAMS are licensed to abstract 9819m^3/d.

Exempt abstractions are not included in the WRMUs. See section 5.2.2 for more information.

5 Northumberland Rivers CAMS licensing strategy

5.1 Sustainability appraisal

5.1.1 Introduction

A sustainability appraisal process has been developed to enable the Agency to take account of pros and cons in the production of CAMS. The process considers the Government's four objectives of sustainable development, relating to the environment, economics, society and resource use. It uses a largely qualitative, pro forma-based approach to consider what the resource availability status for each WRMU should or could be after each six year cycle (sustainability appraisal Tier 1). This is undertaken for all WRMUs in all CAMS areas. It also allows the appraisal of options for recovering water resources, by taking into account the implications of different options on all aspects of sustainability (sustainability appraisal Tier 2). This is undertaken to determine the most sustainable options for the future management of the catchment including, where necessary, options for recovery of resources. More information on the Agency's sustainability appraisal process is provided in *Managing Water Abstraction.* The full pro formas can be viewed in the Northumberland Rivers CAMS Technical Document.

5.2 Catchment overview of licensing strategy

Abstraction licensing in the Northumberland Rivers CAMS area will be based on the assessment carried out for CAMS. This provides the Agency with an improved understanding of where water resources are available and a more structured system of managing abstraction, whilst minimising the risks to the environment.

This section outlines the licensing strategy for the Northumberland Rivers CAMS area. Sections 5.2.1 to 5.2.7 explains the licensing strategy which the Agency has adopted for the Northumberland Rivers CAMS area as a whole. The subsequent sections 5.3 to 5.8 describe in detail the licensing strategy for each WRMU. The strategy provides an indication of whether licences are likely to be available and the conditions that should be expected on licences, although each application will be determined on a case by case basis. However, anyone is entitled to apply for a licence, even if the strategy indicates that there may not be water available.

The document *Managing Water Abstraction* gives a summary of the abstraction licensing process.

5.2.1 Licence determination

Licences for consumptive abstractions that have a net impact on the rivers, will be determined according to the resource availability status of the WRMU, the availability of water at any point in the WRMU and an assessment of local circumstances. New licences will still be granted on a first-come-first-served basis.

Licences that are effectively or totally non-consumptive, and have a minimal impact on the flows in the river, will normally be issued irrespective of the resource availability status, but still subject to assessment of local circumstances.

There is a small outcrop of the Fell Sandstone major aquifier in the Northumberland Rivers CAMS area and hence groundwater abstractions are generally small. Licences for groundwater abstractions will be determined on a case by case basis. Unless investigations prove otherwise, groundwater abstractions will be assumed to have the same effect on river flows as an equivalent surface water abstraction.

5.2.2 Exempt abstractions

There are instances, relating to both purpose and quantity, in which an abstraction licence is not required. Refer to *Managing Water Abstraction* (Annexe 2, section 4) for information on exemptions under the Water Resources Act 1991, sections 26-33.

In the Northumberland Rivers CAMS area, the Northumbrian Water Authority Act 1981 applies. This Act exempts from licensing control abstractions from underground strata and springs where the total quantity abstracted in one year does not exceed 4545m^3 (1,000,000 gallons) and the rate of abstraction does not exceed 227m^3 (50,000 gallons) per day. The Agency holds a public register of some of the abstractions exempt from licensing under the Northumbrian Water Authority Act 1981. The register is voluntary and does not include all abstractions exempt under this Act.

The locations of exempt abstractions, and the quantities abstracted, are generally not known to the Agency. To be exempt from licensing, the quantities abstracted are usually quite small and would not significantly affect the flows in the assessed rivers. Exempt abstractions have therefore not been included in the CAMS process.

5.2.3 Approach to time limiting

New licences and variations to existing licences received on or after 1 October 2001, will generally be issued with a time limit.

The normal duration of a time limited licence granted through the CAMS process is 12 years. For the first round of CAMS, to standardise all licences and bring them in line with this methodology, a common end date has been defined. Therefore all licences granted between now and 2017 will have a common end date of 31 March 2017, providing they are not considered to be damaging to the environment. This depends not only on the results of CAMS but also on an assessment of local circumstances. Any subsequent renewal of a licence will normally be for a further 12 years, i.e. 31 March 2029. However, there may be circumstances where a longer or shorter time limit may be appropriate. Further information on these cases and on time limiting in general can be found in *Managing Water Abstraction.*

There is a presumption of renewal of time limited licences subject to three tests. Licence conditions may be reviewed to ensure that the licence meets the tests. The three tests are:

- environmental sustainability
- continued justification of need
- efficient use of water

Refer to *Managing Water Abstraction* (section 5.6) for further information.

Holders of time limited licences will be notified of licence expiry in time to re-apply for their licences. The Agency will endeavour to give six years notice if a licence is not to be renewed, or is to be renewed but on more restrictive terms which would impact significantly on the use of the licence.

There are a number of existing time limited licences in the Northumberland Rivers CAMS area. The Agency intends to extend the time limits of these licences to 31 March 2017 unless they are no longer required or have an adverse impact on the environment. This depends not only on the results of CAMS but also on assessment of any local circumstances. In due course a letter will be sent to all holders of time limited licences to inform them whether or not the time limit is to be extended.

5.2.4 Water efficiency

The Agency will continue to encourage optimised use of licensed allocations as described in section 5.2. Abstraction is not believed to be adversely affecting the environment in the Northumberland Rivers CAMS area, and the sustainability appraisal has not identified the need for any further measures towards water efficiency.

5.2.5 Management of licences

It is the Agency's policy to enforce abstraction licence conditions and has a programme of routine inspections to achieve this.

5.2.6 Impoundments

Applications for new impoundment licences are dealt with on a case by case basis.

5.2.7 Licensing strategy for Water Resource Management Units

The following sections set out the licensing strategy for the individual WRMUs. It is important to note that this strategy may not apply to non-consumptive licences or licences that are consumptive but result in a net benefit to the environment. All applications for new or varied licences will be considered on a case by case basis.

5.3 Water Resource Management Unit 1: River Aln

5.3.1 Resource availability status and results of the sustainability appraisal

The River Aln WRMU has a resource availability status of ***'water available'.*** Using the Agency's sustainability process, it has been determined that the preferred option for this CAMS cycle is to maintain the resource availability status of ***'water available'.*** The Agency will allow additional unconstrained abstraction within this resource availability status until the scenario flow line reaches, but does not cross, the ecological river flow objective. Crossing the ecological river flow objective would change the resource status to 'no water available' and risk causing adverse environmental impacts.

5.3.2 Guidance on the assessment of new licence applications

New licences, or variations to existing licences, are likely to be issued, subject to normal determination criteria, including assessment of local circumstances. In this WRMU the resource assessment and flow accretion graph (refer to Northumberland Rivers CAMS Technical Document) show that water is available 100% of the time. Therefore, licences without hands-off flow conditions are available until the unconstrained quantity has been allocated. On reaching this point only constrained abstractions at higher flows, in Takes 1, 2 and 3 would be permitted. Takes are referred to in section 4.3 with regard to

the proportion of water that can be abstracted from the river during times of greater flow.

Groundwater licences are available subject to the normal determination procedure, including assessment of local circumstances. Unless investigations prove otherwise, groundwater abstractions will be assumed to have the same effect on river flows as an equivalent surface water abstraction.

All new licences in this WRMU will be subject to efficiency conditions and a time limit. The normal duration of a time limited licence granted through the CAMS process is 12 years. For the first round of CAMS, to standardise all licences and bring them in line with this methodology, a common end date has been defined. Therefore licences granted between now and 2017 will have a common end date of 31 March 2017, however longer or shorter duration licences may be issued as referred to in section 5.2.3.

5.3.3 Renewal of existing time limited licences

There will be a presumption of renewal of time limited licences, subject to the renewal criteria outlined in section 5.2.3 and local circumstances. However, licence conditions may be subject to minor changes, including the addition of water efficiency conditions.

Time limited licences in this WRMU are due to expire before the CAMS common end date of 2017 and it is understood that there are no plans for renewal.

5.3.4 Management of licences

Licences will be subject to inspection according to the Agency's inspection policy. Refer to *Managing Water Abstraction* (Annexe 2, section 5) for more information.

5.4 Water Resource Management Units 2 and 3: Lower and Upper Coquet

5.4.1 Resource availability status and results of the sustainability appraisal

The Lower Coquet WRMU has a resource availability status of ***'over licensed'.*** The ***'over licensed'*** status is due mainly to the large abstraction at the tidal limit. However, this abstraction does not affect the environment of the river upstream. Using sustainability appraisal Tier 1, the Agency has determined that reducing the abstraction quantity at the tidal limit would be an over precautionary measure. The preferred option for the Lower Coquet WRMU is to remain at ***'over licensed'*** so that, subject to appropriate resources being available, the freshwater requirements of the estuary can be investigated.

The Upper Coquet WRMU has a resource availability status of '***no water available***'. The preferred option for the Upper Coquet WRMU is to remain at ***'no water available'*** to ensure that the position within the critical unit (Lower Coquet) is not adversely effected.

Using sustainability appraisal Tier 2, the Agency has determined that the preferred option is to manage abstraction licensing for both the Lower and Upper Coquet WRMUs in accordance with the results of the RAM framework for the Lower Coquet WRMU. Therefore the Agency will only consider applications for limited constrained consumptive licences. Non-consumptive licences will be considered on a case by case basis.

5.4.2 Guidance on the assessment of new licence applications

New or increased consumptive licences will not normally be available at times of low flow. However, subject to normal determination criteria, including assessment of local circumstances, new licences with hands-off flow conditions may be available. In these WRMUs, the hands-off flow would restrict new licences to abstractions from Take 3 only. Takes are referred to in section 4.3 with regard to the proportion of water that can be abstracted from the river during times of greater flow. On average, water would be available for only 60% of the time, which is 219 days per year, although this unlikely to be available in the height of summer.

Licences for groundwater abstractions will be determined on a case by case basis. Unless investigations prove otherwise, groundwater abstractions will be assumed to have the same effect on river flows as an equivalent surface water abstraction.

Where appropriate all new licences or variations to licences, in these WRMUs will be subject to efficiency conditions and a time limit. The normal duration of a time limited licence granted through the CAMS process is 12 years. For the first round of CAMS, to standardise all licences and bring them in line with this methodology, a common end date has been defined. Therefore licences granted between now and 2017 will have a common end date of 31 March 2017, however longer or shorter duration licences may be issued as referred to in section 5.2.3.

Licences for non-consumptive purposes or with a net benefit to the environment may be granted irrespective of the resource availability status, but still being subject to normal determination criteria and assessment of local circumstances.

5.4.3 Renewal of existing time limited licences

For WRMUs that are 'over licensed', non-renewal of time limited abstraction licences or renewal on more restrictive terms is an option. Currently any time limited abstraction licences in these WRMUs, that are non-damaging to the environment, will be converged to the common end date for the Northumberland Rivers CAMS of 2017. There will be a presumption of renewal, subject to renewal criteria outlined in section 5.2.3 and local circumstances. However, licence conditions may be subject to minor changes including the addition of water efficiency conditions.

5.4.4 Management of licences

Licences will be subject to inspection according to the Agency's inspection policy. Refer to *Managing Water Abstraction* (Annexe 2, section 5) for more information.

5.5 Water Resource Management Unit 4: River Lyne

5.5.1 Resource availability status and results of the sustainability appraisal

The River Lyne WRMU has a resource availability status of ***'water available'.*** Using the Agency's sustainability appraisal process, it has been determined that the preferred option for this CAMS cycle is to maintain the resource availability status of ***'water available'.*** The Agency will allow additional unconstrained abstraction within this resource availability status until the scenario flow line reaches, but does not cross, the ecological river flow objective. Crossing the ecological river flow objective would change the resource availability status to 'no water available' and risk causing adverse environmental impacts.

5.5.2 Guidance on the assessment of new licence applications

New licences, or variations to existing licences, are likely to be issued, subject to normal determination criteria including assessment of local circumstances. In this WRMU, the resource assessment and flow accretion graph (refer to Northumberland Rivers CAMS Technical Document) show that water is available 100% of the time. Therefore, licences without hands-off flow conditions are available until the unconstrained quantity has been allocated. On reaching this point only constrained abstractions at higher flows, in Takes 1, 2 and 3 would be permitted. Takes are referred to in section 4.3 with regard to the proportion of water that can be abstracted from the river during times of greater flow.

Groundwater licences are available subject to the normal determination procedure, including assessment of local circumstances. Unless investigations prove otherwise, groundwater abstractions will be assumed to have the same effect on river flows as an equivalent surface water abstraction.

Where appropriate all new licences or variations to licences, in this WRMU will be subject to efficiency conditions and a time limit. The normal duration of a time limited licence granted through the CAMS process is 12 years. For the first round of CAMS, to standardise all licences and bring them in line with this methodology, a common end date has been defined. Therefore all licences granted between now and 2017 will have a common end date of 31 March 2017, however longer or shorter duration licences may be issued as referred to in section 5.2.3.

The flow of the River Lyne is increased by a large discharge of water pumped from a borehole to protect opencast coal workings. Without this discharge, even in the lower part of the River Lyne, there would be very little water available in the summer for abstraction from the river. The ***'water available'*** status is based on the impact of this large discharge. Accordingly, licensing of further abstraction downstream of the discharge is possible, but with a licence condition restricting abstraction to only when the discharge is taking place.

5.5.3 Renewal of existing time limited licences

There will be a presumption of renewal of time limited licences, subject to the renewal criteria outlined in section 5.2.3 and local circumstances. However, licence conditions may be subject to minor changes including the addition of water efficiency conditions. Currently any time limited licences in this WRMU, are due to expire before the CAMS common end date of 2017 and it is understood that there are no plans for renewal.

5.5.4 Management of licences

Licences will be subject to inspection according to the Agency's inspection policy. Refer to *Managing Water Abstraction* (Annexe 2, section 5) for more information.

5.6 Water Resource Management Units 5 and 6: Lower and Upper Wansbeck

5.6.1 Resource availability status and results of the sustainability appraisal

The Upper and Lower Wansbeck WRMUs have a resource availability status of ***'water available'***. Using the Agency's sustainability appraisal process, it has been determined that the preferred option for this CAMS cycle is to maintain the resource

availability status of ***'water available'***. The Agency will allow additional unconstrained abstraction within this resource availability status until the scenario flow line reaches, but does not cross, the ecological river flow objective. Crossing the ecological river flow objective would change the resource availability status to 'no water available' and risk causing adverse environmental impacts.

5.6.2 Guidance on the assessment of new licence applications

New licences, or variations to existing licences, are likely to be issued, subject to normal determination criteria including assessment of local circumstances. In these WRMUs, the resource assessment and flow accretion graph (refer to Northumberland Rivers CAMS Technical Document) show that water is available 100% of the time. Therefore, licences without hands-off flow conditions are available until the unconstrained quantity has been allocated. On reaching this point only constrained abstractions at higher flows, in Takes 1, 2 and 3 would be permitted. Takes are referred to in section 4.3 with regard to the proportion of water that can be abstracted from the river during times of greater flow.

Groundwater licences are available subject to normal determination procedure, including assessment of local circumstances. Unless investigations prove otherwise, groundwater abstractions will be assumed to have the same effect on river flows as an equivalent surface water abstraction.

Where appropriate all new licences or variations to licences, in these WRMUs will be subject to efficiency conditions and a time limit. The normal duration of a time limited licence granted through the CAMS process is 12 years. For the first round of CAMS, to standardise all licences and bring them in line with this methodology, a common end date has been defined. Therefore licences granted between now and 2017 will have a common end date of 31 March 2017, however longer or shorter duration licences may be issued as referred to in section 5.2.3.

5.6.3 Renewal of existing time limited licences

There will be a presumption of renewal of time limited licences, subject to the renewal criteria outlined in section 5.2.3 and local circumstances. However, licence conditions may be subject to minor changes including the addition of water efficiency conditions. Currently, any time limited licences in these WRMUs are due to expire before the CAMS common end date of 2017 and it is understood that there are no plans for renewal.

5.6.4 Management of licences

Licences will be subject to inspection according to the Agency's inspection policy. Refer to *Managing Water Abstraction* (Annexe 2, section 5) for more information.

5.7 Water Resource Management Unit 7: River Font

5.7.1 Resource availability status and results of the sustainability appraisal

The resource availability status of the River Font is ***'no water available'.*** Using the Agency's sustainability appraisal process, it has been determined that the preferred option is to remain at ***'no water available'*** for this CAMS cycle. Within this resource availability status the Agency will only consider applications for limited constrained consumptive licences until the scenario flow line reaches, but does not cross, the ecological river flow objective. Crossing the ecological river flow objective would cause a change in resource availability status to 'over licensed'. Non consumptive licences will be considered on a case by case basis.

5.7.2 Guidance on the assessment of new licence applications

New or increased consumptive licences will not normally be available at times of low flow. However, subject to normal determination criteria, including assessment of local circumstances, new licences with hands-off flow conditions may be available. In this WRMU the hands-off flow would allow water to be abstracted from Takes 1, 2 and 3. Takes are referred to in section 4.3 with regard to the proportion of water that can be abstracted from the river during times of greater flow. This means that water would be available for, on average, 93% of the time, which is 339 days per year, although this is unlikely to be available in the height of summer.

Licences for groundwater abstractions will be determined on a case by case basis. Unless investigations prove otherwise, groundwater abstractions will be assumed to have the same effect on river flows as an equivalent surface water abstraction.

Where appropriate all new licences or variations to licences, in this WRMU will be subject to efficiency conditions and a time limit. The normal duration of a time limited licence granted through the CAMS process is 12 years. For the first round of CAMS, to standardise all licences and bring them in line with this methodology, a common end date has been defined. Therefore licences granted between now and 2017 will have a common end date of 31 March 2017, however longer or shorter duration licences may be issued as referred to in section 5.2.3.

5.7.3 Renewal of existing time limited licences

Currently there are no time limited licences in this WRMU.

5.7.4 Management of licences

Licences will be subject to inspection according to the Agency's inspection policy. Refer to *Managing Water Abstraction* (Annexe 2, section 5) for more information.

5.8 Water Resource Management Units 8, 9 and 10: Lower Blyth, Upper Blyth and River Pont

5.8.1 Resource availability status and results of the sustainability appraisal

The Lower Blyth, Upper Blyth and River Pont WRMUs have a resource availability status of ***'water available'***. Using the Agency's sustainability appraisal process, it has been determined that the preferred option for this CAMS cycle is to maintain the resource availability status of ***'water available'***. The Agency will allow additional unconstrained abstraction within this resource availability status until the scenario flow line reaches, but does not cross, the ecological river flow objective. Crossing the ecological river flow objective would change the resource status to 'no water available' and risk causing adverse environmental impacts.

5.8.2 Guidance on the assessment of new licence applications

New licences, or variations to existing licences, are likely to be issued, subject to normal determination criteria including assessment of local circumstances. In these WRMUs, the resource assessment and flow accretion graph (refer to Northumberland Rivers CAMS Technical Document) show that water is available 100% of the time. Therefore, licences without hands-off flow conditions are available until the unconstrained quantity has been allocated. On reaching this point only constrained abstractions at higher flows, in Takes 1, 2 and 3 would be permitted. Takes are referred to in section 4.3 with regard to the proportion of water that can be abstracted from the river during times of greater flow.

Licences for groundwater abstractions will be determined on a case by case basis. Unless investigations prove otherwise, groundwater abstractions will be assumed to have the same effect on river flows as an equivalent surface water abstraction.

Where appropriate all new licences or variations to licences, in these WRMUs will be subject to efficiency conditions and a time limit. The normal duration of a time limited licence granted through the CAMS process is 12 years. For the first round of CAMS, to standardise all licences and bring them in line with this methodology, a common end date has been defined. Therefore licences granted between now and 2017 will have a common end date of 31 March 2017, however longer or shorter duration licences may be issued as referred to in section 5.2.3.

5.8.3 Renewal of existing time limited licences

Currently there are no time limited licences in these WRMUs.

5.8.4 Management of licences

Licences will be subject to inspection according to the Agency's inspection policy. Refer to *Managing Water Abstraction* (Annexe 2, section 5) for more information.

5.9 Tributaries and estuaries

Applications for abstractions from small tributaries, estuaries and small coastal streams not included in the CAMS process will be determined using the existing licensing strategy on a case by case basis and by the effect, if any, they will have on a main river.

5.10 Opportunities for licence trading in the Northumberland Rivers CAMS area

One of the objectives of the CAMS process is to facilitate licence trading. The term licence trading refers to the transferring of licensable water abstraction rights between two or more parties. Licence trading is essentially a new phrase to describe a particular application of existing licensing processes. More detailed information is available in *Managing Water Abstraction (*Section 4).

A guidance leaflet (*Water Rights Trading*) was published and sent to licence holders towards the end of 2002 explaining the scope for abstraction licence trading within current legislation. Consultation on more detailed proposals took place in summer 2003. After considering responses to the consultation exercise, in the autumn of 2003, further information will be made available to update licence holders on the Agency's conclusions for a detailed framework within which licence trading may take place.

5.11 The impact of the Water Bill

The Government, as well as the Agency and other organisations, considers that significant changes to the water abstraction authorisation system are now needed in order to help ensure that we continue to use water resources sustainably. Over the last few years, Government proposals and decisions have been set out in a series of consultation and decision papers, resulting in the publication of a draft Water Bill in November 2000. The proposed Water Bill will complement existing Agency initiatives, such as the review and curtailment of damaging abstractions, the development of a framework for trading in water rights, implementation of the Agency's policy on time limiting licences and the development of CAMS.

6 Future developments in the Northumberland Rivers CAMS area

Much of the Northumberland Rivers CAMS area is rural. In these rural areas, there is a possibility of a demand for the greater use of direct river abstraction for agricultural irrigation. In the River Coquet WRMUs and in many of the smaller rivers and tributaries elsewhere in the Northumberland Rivers CAMS area, summer abstraction at other than small abstraction rates will be severely restricted and winter storage will be encouraged.

With regard to changes in agriculture and land use, as CAMS is on a six year rolling cycle, the next time the Northumberland Rivers CAMS is reviewed any emerging changes in trends will be assessed and evaluated at this point.

Through the process of the Northumberland Rivers CAMS the Agency has identified the following areas where developments need to be made to assist with the next round of the Northumberland Rivers CAMS. Ecological data will be gathered for the River Font upstream of the AP, and there will be an investigation into the freshwater requirements of the River Coquet estuary.

7 Post-CAMs appraisal

The Agency will review the Northumberland Rivers CAMS starting in 2007 and publish the updated version of the CAMS in 2009. The result of CAMS driven investigations will be considered during this review.

The progress and implementation of the Northumberland Rivers CAMS will be assessed using the following indicators:

- the resource availabilty status of each WRMU either remains unchanged or improves
- visits to licence holders to ensure that licence conditions are met and comply with current legislation
- the protected rights of existing abstractors and existing lawful uses are not adversely affected
- routine sampling programmes will continue to monitor fisheries, macrophytes and macroinvertebrates communities
- gauging stations will continue to monitor river flows and levels
- sampling will occur on the River Font to ascertain any freshwater impacts downstream of Fontburn Reservoir
- the freshwater requirements of the River Coquet estuary will be investigated
- adds value to the water resource position given in the regional and national Water Resources Stategies with specific area information
- successful applications for new or significantly varied abstraction licences in each WRMU will be granted with consideration of the resources availability status for that WRMU to protect low flows and flow variability

Mitford gauging station on the River Wansbeck

Glossary of terms and abbreviations

Abstraction Removal of water from a source of supply (surface or groundwater).

Abstraction – Actual The volume of water actually abstracted as opposed to the volume of water that may be abstracted under the terms of an abstraction licence. Individual abstraction records are reported to the Environment Agency each year.

Abstraction licence The authorisation granted by the Environment Agency, which defines the legal limits and conditions on abstraction, to allow the removal of water from a source.

Aquifer A geological formation, group of formations or part of a formation that can store and transmit water in significant quantities.

Assessment Point Critical point in catchment at which an assessment of available resources should be made. Assessment points are located at the extremities of identified reaches and water resource management units.

Baseflow That part of the river that is derived from groundwater sources rather than surface runoff.

Biodiversity The living component of the natural world. It embraces all plant and animal species and communities associated with terrestrial, aquatic and marine habitats. It also includes genetic variation within species.

Borehole A well sunk into a water bearing rock from which water will be pumped.

Catchment The area from which precipitation and groundwater will collect and contribute to the flow of a specific river.

Compensation release Water released from reservoirs to maintain a flow in the river downstream.

Confluence The point where two or more streams or rivers meet.

Constrained abstraction An abstraction source which operates within pre defined flow/level or water quality constraints.

Consumptiveness Proportion of the water not returned either directly or indirectly to the source of supply after use e.g. water evaporated, transpired or transferred elsewhere.

Demand The requirements for water for human use.

Discharge The release of substances (i.e. Water, sewage etc.) into surface waters.

Discharge Consent A statutory document issued by the Environment Agency, which defines the legal limits and conditions on the discharge of an effluent into controlled waters.

Drift A loose deposit of sand, gravel, clay etc.

EC Directive Issued by the European Commission to member states with the objective of producing common standards in the European Community – member states are then obliged to introduce appropriate legislation to comply with the Directive.

Ecology The study of how living things relate to one another and their environment and surroundings.

Ecological river flow objectives The minimum river flows (or water levels) required to protect ecological objectives.

Effluent Liquid waste from industrial, agricultural or sewage plants.

Environmental impact The total effect of any operation on the environment.

Environmental Weighting An assessment of a river's sensitivity to abstraction based on physical characteristics, fisheries, macrophytes (plants) and macro-invertebrates for a catchment/sub-catchment.

Flow accretion graph A graph of flow in a river against distance down the river which shows the impacts of artificial influences and natural flow variations.

Gauging station A site where the flow of a river is measured.

Groundwater Water occurring below ground in natural formations (typically rocks, gravels and sands).

Groundwater Management Units Administrative sub-divisions of aquifers, defined on geological and hydrogeological criteria, which form the basis for groundwater resource management and licensing policy decisions.

Habitat Place in which a species or community of species live, with characteristic plants and animals.

Hands-off Flow A condition attached to the abstraction licence so that if the flow in the river falls below the flow specified on the licence then the abstractor may be required to stop or reduce the abstraction.

Hydrogeology Branch of geology concerned with water within the Earth's crust.

Hydrology The study of water on and below the earth's surface.

Hydrometry The measurement of water on or below the earth's surface.

Impoundment A dam, weir or other work constructed in an inland water, whereby water may be impounded and any works for diverting flows in an inland water associated with the construction of a dam, weir or other work.

Irrigation Supply (land) with water by means of artificial canals, ditches etc, especially to promote the growth of food crops.

Licence Formal permit allowing the holder to engage in an activity (in the context of this document, usually abstraction), subject to conditions specified in the licence itself and the legislation under which it was issued.

Licence application Formal request by individual or organisation to the competent authority for a licence. For abstraction licences, the competent authority is the Environment Agency.

Licence determination A decision by the competent authority on whether and on what terms to grant or refuse a licence application, by reference to the authority's regulatory powers and duties.

Licence trading A commercial transaction for the purpose of transferring an abstraction licence between two parties.

Main river The watercourse shown on the statutory 'Main River Maps' held by the Agency and DEFRA. The Agency has permissive powers to carry out works of maintenance and improvements on these rivers.

Managing Water Abstraction Document produced in April 2001 on the CAMS Process.

Non-consumptive This is where all abstracted water is returned to source a relatively short distance downstream of the abstraction point.

Outcrop The total area over which a particular rock unit occurs at the surface whether visibly exposed or not.

Permeability The characteristic of a rock or soil that determines the rate at which fluids pass through the rock or soil under the influence of differential pressure.

Precipitation Deposition of moisture including dew, hail, rain, sleet and snow.

Public water supply Term used to describe the supply of water provided by a water undertaker.

RAM Framework Resource Assessment and Management Framework – a technical framework for resource assessment (for the definition and reporting of CAMS) and subsequent resource management (including abstraction licensing).

Ramsar site A site of international conservation importance classified at the 'Convention on Wetlands of International Importance' 1971, confirmed by the UK Government in 1976.

Reach length of river.

Rio Earth Summit, 1992 This was the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro. It was the largest ever gathering of world leaders (over 150 Heads of Government). At this conference 153 countries signed the Convention on Biological Diversity.

Riparian Relating to the banks of a river or adjoining land.

River An open channel in which inland, surface water can flow.

River flow objectives The minimum river outflows from the area required to protect ecological objectives, effluent dilution requirements, navigation and amenity in-river needs.

River reach Unit of a river between two assessment points, delineated for the purposes of abstraction licensing and resource management.

Scenario flows The flows, which would leave the assessment point in the specified year, based on the assumed scenario abstractions and discharges.

Special Area of Conservation (SAC) A Special Area of Conservation is one classified under the EC Habitats Directive and agreed with the EC to contribute to biodiversity by maintaining and restoring habitats and species.

Special Protection Area (SPA) A Special Protection Area is one classified as such under the EC Birds Directive to provide protection to birds, their nests, eggs and habitats.

Spray irrigation Abstracted water sprayed onto grassland, fruit, vegetables etc. Can have a high impact on water resources.

Springs A natural emergence of groundwater at the surface which occurs where the water table intersects the ground surface.

Site of Special Scientific Interest A Site of Special Scientific Interest is an area given a statutory designation by English Nature or the Countryside Council for Wales because of its nature conservation value.

Surface water This is a general term used to describe all the water features such as rivers, streams, springs, ponds and lakes.

Surplus or deficit How much more or how much less abstraction impact is acceptable:

= Scenario flows – River flow objectives.

Sustainable development Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. This involves meeting four objectives simultaneously:

- social progress which recognises the needs of everyone;
- effective protection of the environment;
- prudent use of natural resources;
- maintenance of high and stable levels of economic growth and employment.

Tidal limit The most upstream point within an estuary or river where water levels are subject to tidal variation.

Time limited licence Licence with specified end date.

Topography Physical features of a geographical area.

Treatment works sewage treatment works or water treatment works.

Tributary A stream or river which feeds into a larger one.

Unconstrained abstraction Abstractions not related to hydrological or water quality constraints.

Underground strata A term used to signify geology under the surface soil layer.

Water resource The naturally replenished flow or recharge of water in rivers or aquifers.

Water Resource Management Unit An area that has similar groundwater and or surface water characteristics and is managed in a similar way.

AONB Area of Outstanding Natural Beauty.

AP Assessment Point.

BAP Biodiversity Action Plan.

CAMS Catchment Abstraction Management Strategy.

DEFRA Department for Environment, Food and Rural Affairs.

GWMU Groundwater Management Unit.

EC European Commission.

EW Environmental Weighting.

km Kilometres.

m^3/d Cubic metres per day.

Ml, Ml/d Ml = megalitres = 1,000,000 litres = 1,000 cubic metres = 1,000 m^3 = 220,000 gallons

Ml/d = Ml per day, = thousand cubic metres per day (tcmd).

mm Millimetres.

Q95 The measured flow of a river which is exceeded on average for 95% of the time, including the effects of abstractions and discharges.

QN95 The natural flow of a river which is exceeded on average for 95% of the time, not including the effects of abstractions and discharges.

SAC Special Area of Conservation.

SNCI Site of nature conservation interest / importance.

SPA Special Protection Area.

SSSI A Site of Special Scientific Interest i.e. an area given a UK statutory designation because of its conservation value.

WRMU Water Resource Management Unit.