NEW FOREST NATIONAL PARK

Pond Conservation
For life in fresh waters

New Forest Catchment

Water Environment Improvement Plan

Version 1.1

19 December 2012

Document Control

Version History

Version	Author	Date	Reason for Change	Superseded Documents
0.5	Jim Whatley/Naomi Ewald/Ian Barker	13/11/12	Draft for CDG	Nil
1.0	Jim Whatley/Naomi Ewald	12/12/12	Incorporate other stakeholders comments	V0.5
1.1	Jim Whatley/Naomi Ewald	19/12/12	Minor amendments from stakeholders	V1.0

Contacts

All questions relating to it are to be addressed to:

Jim Whatley

New Forest National Park Authority, Town Hall, Lymington, Hampshire, SO41 9ZG

Tel: 01590 646675

E-Mail: jimwhatley@newforestnpa.gov.uk

Or

Ian Barker

New Forest National Park Authority, Town Hall, Lymington, Hampshire, SO41 9ZG

Tel: 01590 646685

E-Mail: ian.barker@newforestnpa.gov.uk

Document Support

Document supported by the New Forest Catchment Development Group

Part III

FIGURES

TABLES

This document outlines the results of work undertaken by the New Forest National Park Authority and Pond Conservation leading an initial core group of other stakeholders during the New Forest Catchment pilot. It is intended as a starting point to identify the aspirations of organisations and communities within the New Forest catchment to protect and improve our unique water environment and to develop collaborative actions to achieve those aims. It should be understood at the outset that references to the New Forest 'catchment' in the document refer to the Water Framework Directive catchment boundary which does not include streams flowing west into the River Avon or east into the River Test.

It was recognised that during the short period of the pilot a meaningful completed 'catchment plan', working with a full range of stakeholders and covering all the many separate New Forest streams, could not be achieved. It was therefore decided to direct most of our efforts at the sub-catchment level developing 'on the ground' actions with local stakeholders and encouraging local ownership.

This is therefore intended as a 'living document' which can be built on and grow over a period of years as more sub-catchments and stakeholders are included. It is aimed more at those organisations and communities who will be directly involved, rather than the general public for whom a summary will be produced.

The document is divided into three parts detailing:

Part I The background to the work, the approach adopted and recommendations as to how it should be taken forward in the future.

Part II A description of the New Forest catchment, why is it important and worth protecting, its problems, what's already been done to address them and our aspirations for the future.

Part III Descriptions of each of the sub-catchments - including where they are, their characteristics, problems and who we need to work with to make improvements. This part is intended to grow as more work is undertaken and at present includes details of the action taken in the three sub-catchments we have focussed on during the pilot.

The New Forest Catchment project is one of a number of pilots in England and Wales which were initiated and funded by Defra in 2012. Their aim was to test different collaborative approaches by stakeholders to improving the rivers, streams, lakes, coastal waters and groundwater of these catchments, working towards the development of a catchment plan. The impetus of the work was largely to achieve the objectives of the Water Framework Directive for all waterbodies to meet Good status. The New Forest National Park Authority together with Pond Conservation were chosen to lead the New Forest catchment pilot project covering the streams flowing east into Southampton Water and south into the Solent but excluding those flowing west into the River Avon. Over 50% of these streams do not achieve Good status with most of the coastal and estuary waterbodies also failing and only the Groundwater fully passing.

An initial Catchment Development Group, made up of core stakeholders, was formed and identified the main issues of concern in the water environment of the Forest to be urban and rural diffuse pollution, waste water discharges, habitat management and modifications and invasive non-native species. We felt strongly that these issues had been discussed many times at a general level but action now needed to be taken on the ground if the problems were to be resolved. As a result we focussed on liaising with individual stakeholders directly via one-to-one meetings to understand their views which informed the development of the pilot.

We decided that a local sub-catchment approach should be taken working with communities and local stakeholders to develop longer term ownership as well as fixing current problems. We recognised that this would be a more time consuming approach and would not be achieved overnight. Three streams were therefore chosen to test the approach: the Becton Bunny at Barton on sea, the Hatchet Stream and Pond, the Sowley Stream and Pond together with the Sowley Lagoon on the Solent coast. Detailed walkovers were conducted and very productive discussions took place with local landowners and other interested parties regarding improvements that could be made. We also ensured that the initiatives of various statutory bodies, working in the same sub-catchment, were coordinated to ensure maximum benefits were achieved. Work on the Sowley Lagoon was led by the Solent Forum to test whether this group could lead on future coastal issues for the project.

The Catchment Development Group recognises that the New Forest is a unique and special habitat for wildlife and considers that we have the opportunity to protect and restore our freshwater and coastal habitats to the ***very highest standard.*** The Catchment Development Group's vision is to go further than the Water Framework Directive by including ponds, small lakes, headwaters and mires and aiming to improve to ***High*** status, where this is achievable.

The project ends on 31 December 2012 but it is intended that the programme of work will continue coordinated by the New Forest National Park Authority and Pond Conservation to cover all sub-catchments. This document will provide stakeholders with the common basis from which this work can proceed.

PART I – Background, project approach and the way forward

1 The Background

In 2009 the Environment Agency published the South East River Basin Management Plan which is split into 'catchments' one of which covers the majority of the New Forest and its coastal area. These 'catchments' are in turn split into waterbodies which cover rivers, lakes, groundwater, estuaries and coastline out to one nautical mile. Each waterbody is classified according to their ecology and chemistry and required to reach Good status by at least 2027 with no deterioration permitted.

To achieve Good status, the Environment Agency has been working to confirm their own classifications and identify actions to improve those waterbodies which are not reaching Good status.

It was recognised by the Environment Agency that they would have to work closely with statutory bodies, other organisations and people to co-deliver the required improvements.

In 2011 Defra announced it would be exploring new ways of collaborative working and set up a number of pilot projects, led by the Environment Agency, to test different approaches to improved engagement, information sharing and co-ordination at a catchment level. Other organisations were also invited to bid for funding to host similar pilot projects co-ordinating a collaborative approach to improving the water environment. Although largely driven by Water Framework Directive requirements, the remit of these projects extended to identifying stakeholder priorities which went over and above those requirements and benefited the water environment as a whole.

The Water Framework Directive is a piece of European legislation which requires nation states to achieve a Good status of water quality and quantity in all water bodies (including rivers, streams, lakes, estuaries, groundwater and marine waters up to one nautical mile from shore) by 2027 at the latest. It recognises that where some waterbodies have been modified for some specified purpose (eg. flood defence) they may not be able to achieve this and, where this purpose is still required, they have to achieve Good potential rather than Good status.

The challenging deadline of 31st December 2012 for these pilot projects was dictated by the need for any resulting action plans to be included in the next River Basin Management Plan due to be published in 2015.

In early 2012 the New Forest National Park Authority, with technical support from Pond Conservation, were selected and funded by Defra to host a pilot project in the New Forest catchment.

2 The New Forest Catchment Pilot Project

This section outlines some of the previous initiatives undertaken to obtain New Forest stakeholder views regarding the issues affecting the water environment of the catchment together with ways to improve it. It then details the sub-catchment approach adopted by the project and why it was taken. This is followed by how a stakeholder collaborative approach has been used to commence a plan for the catchment based principally at a sub-catchment level and finally how the local assessment and liaison work was undertaken.

Finally it recommends how this plan might continue to be developed when the project finishes.

2.1 Previous Stakeholder Initiatives

A number of initiatives have already taken place over the last 15 years which have included engaging New Forest stakeholders in identifying issues affecting the water environment and ways of improving it.

In 1997 a project engaging New Forest stakeholders featuring four facilitated structured workshops took place with a broad range of local organisations and groups to prioritise the issues identified in the New Forest Local Environment Agency Plan. These plans were to be used as integrated planning tools to take a holistic approach to protection and enhancement of the environment and encourage work in partnership with the public, local authorities, organisations and public bodies. These plans were the successors to the National River's Authority's Catchment Management Plans which also engaged similar stakeholders.

In 2008 and 2009 two day-long workshops took place involving a wide range of New Forest stakeholders driven by the requirements of the Water Framework Directive. The purpose of these was to agree the water environment issues affecting the New Forest catchment identified in the River Basin Management Plan and to suggest actions to remedy these.

Given that most of the interested parties had been involved in all of these initiatives, it was seen as essential that the current project prevented stakeholder fatigue by seeking on the ground local action rather than constantly identifying the issues without moving on.

2.2 Sub-Catchment Approach

Most of the previous stakeholder initiatives that have taken place to date have largely involved representatives covering the catchment as a whole. However the New Forest is not a single 'catchment' in that it is not a single river system but rather a number of small and medium sized largely unconnected streams flowing either south or west. In many cases representatives interested in one area of the catchment have no knowledge or indeed interest in other areas. Although there are several common issues relating to forest, agricultural and urban habitats, to achieve meaningful improvements to the water environment a more local approach is required in this catchment.

To do this we opened discussions with local communities, landowners, organisations and other interested parties to develop an appreciation and ownership of local water environments at that level. This would not only lead to improvements but potentially maintain their quality in the future which is an important aspect of the Water Framework Directive which allows for 'no deterioration'.

We therefore decided not to hold another catchment-wide workshop but rather to put the project emphasis on planning and delivering actions at a sub-catchment level.

The project therefore splits the catchment into geographical groups of Water Framework Directive waterbodies with the work very often focused down to a waterbody level. The geographical groups have been notionally named as follows:

a) New Milton
b) Lymington River
c) Beaulieu Heath
d) Beaulieu River

e) Lepe
f) Waterside
g) Bartley Water

Figure 1 shows the boundary of the New Forest catchment and the locations of the sub-catchment groups.

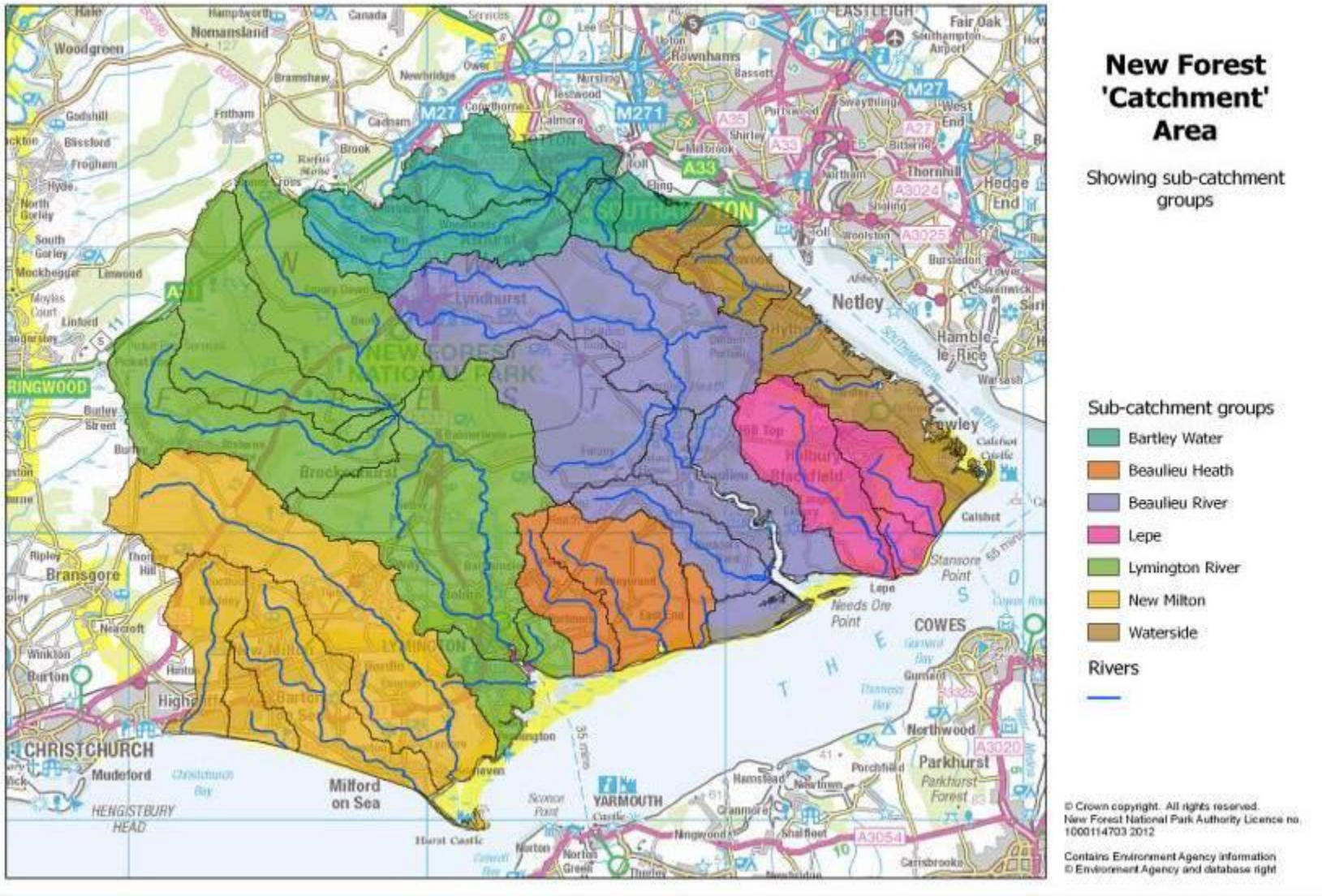


Figure 1 - New Forest catchment boundary and groups

Working with stakeholders at a sub-catchment level, although extremely effective, is time consuming and it was clear that within the timescales of the project and with the resources available, only a small number of sub-catchments could be addressed in detail.
It was therefore decided to concentrate on 3 sub-catchments:

Becton Bunny *(New Milton Group)*

Sowley Stream/Sowley Pond/Sowley Marsh *(Beaulieu Heath Group)*

Hatchet Stream/Hatchet Pond *(Beaulieu River Group)*

2.3 Collaborative Working and Liaison

The New Forest Pilot Project is about bringing people together to appreciate their water environment and informing and enabling those people to support its improvement at a local level. It is about bringing together statutory bodies and other organisations that are already engaged in initiatives and projects that will benefit the water environment, but whose work needs to be coordinated to be cost effective and deliver maximum benefits. It is about balancing the needs of commoning, agriculture, forestry and residential communities with the development of a healthy and thriving waterbodies.

The New Forest National Park Authority and Pond Conservation are co-ordinating the initial work of developing a New Forest Catchment Plan based largely on sub-catchments.

2.3.1 Catchment Development Group

This Catchment Development Group comprises a number of representative stakeholders who have been brought together for the duration of the project to work with the New Forest National Park Authority and Pond Conservation to initiate the development of a catchment plan for the New Forest. The group was intentionally kept relatively small due to the project timescales. It is however intended that it will form the core of an expanded stakeholder group that will continue to develop the plan and integrate action after the current project pilot finishes. The core group at present comprises the following organisations or sector representatives:

New Forest National Park Authority

Pond Conservation

Hampshire & Isle of Wight Wildlife Trust

Forestry Commission

New Forest District Council

New Forest Association

Natural England

Verderers

Commoners and small farmers

Environment Agency

Solent Forum

Southern Water Services

Estate and large farmers

This group developed a shared understanding of the current issues and problems facing the water environment of the New Forest based largely on the previous larger stakeholder workshops.

They decided that, although it was important to work towards bringing all Water Framework Directive waterbodies up to Good Status, due to the unique and special character of the New Forest, they wished to aim for the top water quality category of High Status where it was felt this could be achieved.

Stakeholders also felt it was important to include smaller waterbodies such as ponds, small lakes, headwaters and mires that are not addressed by the Directive but were nonetheless critical to the special nature of the Forest's water environment.

There was agreement that the 'sub-catchment' approach was a natural progression in moving towards taking action that could make a real difference on the ground.

2.3.2 Sub-Catchment Method of Work

The following on-going approach was taken to assessing the issues and planning actions in each of the sub-catchments.

i. *Desk-top familiarisation* – utilise the Environment Agency waterbody summary sheets to identify Water Framework Directive reasons for failure and initial planned actions, identify landowners and key stakeholders

ii. *Identify other relevant initiatives* – liaise with statutory bodies and organisations to identify other initiatives that are already taking place or planned in a sub-catchment in order to co-ordinate or enhance them eg. Natural England Higher Level Stewardship (HLS) schemes

iii. *Liaise with Environment Agency* – Work with the internal Environment Agency WFD Stage 3 working group to ensure a co-ordinated approach to taking action

iv. *Initial Walkover* – conduct an initial walkover of the sub-catchment in public areas, where no permission is required, to identify potential problems by observation and local water quality sampling

v. *Produce Technical Summary* – as a result of the initial walkover a technical summary is produced as a communication tool with which to liaise with landowners and other interested parties

vi. *Initial Approach to Landowners* – approach private landowners to initially discuss issues and gain permission for detailed walkover

vii. *Liaise with other interested parties* – visit and present to local councils, resident groups and schools to ensure awareness of potential improvement works, ascertain their hopes and fears and educating them about and engendering ownership of their water environment

viii. *Detailed Walkover* – conduct detailed walkover of the sub-catchment to identify specific water quality, structural and morphological problems and potential

remedial actions

ix. *Landowner negotiations* – Negotiate with landowners to agree actions and investigate possible funding

x. *Other Organisation negotiations* – Negotiate with other organisations to take remedial actions where appropriate or develop or change policies eg. Local council habitat management, Highway authority maintenance policies

xi. *Identify wider action delivery* – Identify actions that can be better delivered across the catchment as a whole or across a larger area

A series of general explanatory easily read technical documents were produced with which to communicate with relevant stakeholders and interested parties. These can be found in Appendix A.

3 Taking the Project Forward

The collaboration, liaison and planning undertaken during the life of this project together with this document were always intended as a starting point which could be built on to cover the whole New Forest catchment.

The recommendations of how this catchment work should proceed falls into three main areas: the status of the work, how this work is coordinated and its extension to other sub-catchments.

3.1 Status of the Work

The status of the catchment work at present is that of an on-going project. It is necessarily time consuming and very often slow work and will continue for a number of years as it is extended throughout the remaining catchment. It will involve further identification and prioritisation of issues important to stakeholders of the New Forest catchment together with liaison and collaboration to co-ordinate actions to address those issues. Although it will involve new areas of work and pulling together existing initiatives, it will not be a project itself - rather it will be on-going co-ordinating work.

3.2 Future Co-ordination

3.2.1 Catchment Development Group Expansion

It is anticipated that because the New Forest catchment is not one river system, much of the liaison and collaboration will take place at a sub-catchment level. However in order to improve the water environment in an integrated and cost effective way to deliver maximum benefits for both wildlife and people, a group with an overall view is required which is both representative of the catchment interests and those that can deliver catchment-wide improvements.

This group will own the overall vision for the New Forest catchment water environment and be in a position to prioritise sub-catchments and actions to ensure different organisation's initiatives are integrated. They will not be expected to always agree, but will give the best chance of delivering co-ordinated action. It will also serve as a forum for those interested

parties in the New Forest catchment who wish to be kept informed of what is going on.
It is suggested that the Catchment Development Group comprises representation from organisations that can potentially deliver change over several sub-catchments, those that can give advice and express the views of a particular sector and those that are interested in what is going on.

Those core members that are likely to be directly involved in delivery of on the ground water improvement actions or advising on them would physically attend meetings, whilst those with a watching brief would be kept informed, but only attend when they had a particular interest.

The group would retain its current name to avoid confusion, but representation should be increased.

3.2.2 Catchment Development Co-ordination

Real on the ground integrated improvement actions and the development of community ownership of the water environment will not happen unless one organisation has a view of the whole and co-ordinates collaborative action.

It is therefore recommended that funding is sought for the New Forest National Park Authority to continue to co-ordinate this planning, action and education, with Pond Conservation providing the technical expertise.

Pond Conservation would undertake the technical assessment and develop possible solutions in sub-catchments but would not be responsible for their delivery.

The two organisations would be co-ordinators of the work on behalf of the New Forest catchment stakeholders rather than being known as the lead organisations.

Individual organisations would still remain responsible for obtaining funding and delivering their own initiatives.

3.2.3 Extending the Sub-Catchment Approach

The current work on the Sowley Stream/Pond/Marsh, Hatchet Stream/Pond and the Becton Bunny should continue whilst work is extended to other sub-catchments.

It is recommended that the newly constituted Catchment Development Group should be responsible for deciding the order in which further sub-catchments should be addressed based on recommendations by the co-ordinators.

It is anticipated that a number of sub-catchments will be dealt with concurrently resulting in the co-ordination work growing over time as individual sub-catchments reach different stages of progress.

3.2.4 Research

Research and monitoring work will be necessary to ensure that real measurable improvements to the water environment of the New Forest are realised and truly beneficial. Some work has already been undertaken by academic establishments, government agencies, wildlife charities and individuals and it is important to draw on existing information to determine trends. Meetings with Southampton University, local and national species experts, the Environment Agency and Natural England have shown that they are willing to share the results of monitoring on freshwater habitats in the New Forest and it is hoped that this will be true of other similar organisations and experts.

A review of existing datasets has also identified gaps in monitoring – geographically and in

terms of the parameters which have been measured. New research may be needed before we can determine the status of some waterbodies and the action required to address certain issues. There is also a lack of evidence as to the efficacy of some prescriptions used to improve freshwater habitats. In order to provide cost-effective programmes in the future, restoration programmes will need to be monitored and preferably trialed on a small scale to determine their effectiveness within the catchment before they are rolled out across the New Forest.

It is therefore recommended that appropriate organisations and individual experts are approached with a view to obtaining agreement to setting up a virtual research group that can be contacted for advice, sharing data and developing new research programmes when required.

3.2.5 Education

In order to not only improve the water environment in the short-term, but protect it in the longer term it is imperative to develop ownership by the communities through which streams flow and ponds are located. It is important that this education starts at an early age and children are inspired to care for their environment.

The National Park Authority's education officers are already working with schools in the New Milton area as part of action being taken to improve the Becton Bunny stream. Field work is being planned to fit in with the national curriculum which will possibly include species recognition and simple quality monitoring.

It is recommended that this work continues and is extended to other suitable catchments especially where the steam flows through an urban area.

3.2.6 Informal Monitoring

The Environment Agency undertakes water quality monitoring on a number of streams within the catchment. However this monitoring is necessarily targeted at specific issues and does not address more localised and intermittent impacts.
Whilst it is recognised that there is a need for formal monitoring to strict scientific procedures, there is also a substantial opportunity to involve local people in well designed simple monitoring. This could add to existing data, increasing the frequency of monitoring and the number of places monitored. The **Community Wildlife Plans Project,** being run through the Land Advice Service based at the National Park Authority, is already working with local communities organising species surveys and recording with a view to them producing local wildlife plans. It is recommended that this work be extended to include informal water quality monitoring, if interest can be generated and simple equipment can be provided. In this way if problems are identified and pinpointed the Environment Agency can target their formal monitoring and evidence can be provided to affect change.

3.2.7 Planning Services

Opportunities to take action to improve the water environment regularly occur when planning applications are submitted, especially in respect of small or medium size developments. Case officers in both the New Forest National Park Authority and New Forest District Council forward applications to an ecologist for consideration where they believe there are ecological constraints or there are opportunities to enhance biodiversity.

It is recommended that workshops be run to enable case officers to recognise opportunities to improve the water environment, especially where it is currently failing or at risk of deterioration, and encourage a more pro-active approach eg. removal of culverts.

PART II – The New Forest Catchment - description, problems, initiatives and aspirations

4 About the New Forest Catchment

The New Forest catchment covers over 300km^2 and corresponds in part with the New Forest National Park. It also includes a number of urban streams on the park's periphery and extends into the transitional and coastal waters of The Solent. The western flowing streams which drain in to the River Avon are not part of the New Forest catchment although many of the issues and principles will apply across catchment boundaries.

The catchment includes around a dozen rivers, streams and their tributaries, 2 lakes (greater than 2ha in size), many hundreds of ponds (less than 2ha in size), 2 estuaries, 3 coastal areas, 2 lagoons and 2 groundwater waterbodies. The varied nature and high quality of many of these habitats is reflected in the number of species they support and their importance for nature conservation.

4.1 The habitats of the New Forest Catchment

4.1.1 New Forest Rivers

The New Forest catchment is a geographical area comprised of many independent streams, rising in the heart of the Forest and draining south and east to Southampton Water and The Solent. A lot of work has been undertaken on these streams and a detailed description of their form, function and biology has been prepared by Terry Langford (University of Southampton)[1].

In summary, these lowland streams are generally short in length – even the Lymington River is less than 35km, but many like the Magazine Lane Stream and Walhampton Stream are much shorter (less than 2km). Many of the headwater streams rise and flow through the Open Forest – the area of unenclosed vegetation which is grazed by commoner's livestock. These near natural streams have very low levels of nutrients (nitrate <2mg l^{-1}; phosphate <0.01mg l^{-1}) and are low in calcium and generally circum-neutral in pH (6.0-7.3), although some streams draining the more acidic mires may be as low as pH3.

The Forest streams have a naturally 'spatey' flow, which means they increase in volume and sediment load after heavy rainfall. Some streams even dry out during the summer months – a natural feature of many headwaters. For streams which drain the valley mires, the surrounding habitat acts like a sponge, reducing some of their flashy nature and maintaining some flow during dry summers.

The main characteristic driving the communities in these streams is the presence of streamside woodland casting shade over the stream. In open stretches, aquatic plants provide habitat for invertebrate animal communities. Whilst the woodland stretches generally support few or no plants, with debris dams of leaves and twigs providing an additional natural habitat type for aquatic animals. Both open and shaded habitat types are important components of the New Forest freshwater ecosystem (Figure 2).

[1] Langford, et al. (2010) Chapter 15. Biological diversity in New Forest streams, in *Biodiversity in the New Forest*. Pisces Publications.

Figure 2 - New Forest river habitat types - both open and shaded rivers are valuable for wildlife.

New Forest streams are naturally shallow and should have good 'riffle and pool' structure, although historical drainage has changed the shape and flow of several streams which still flow through otherwise semi-natural habitat.

4.1.2 New Forest Ponds and Lakes

The ponds of the New Forest are as much a part of the landscape as the heathland, woodland, grassland and river habitats that are so often used to describe this area of lowland Britain. They occur in every habitat type and on every type of geology within the Forest and as a result show a huge diversity of pond types which in turn supports an incredibly varied and rich invertebrate animal community. In spite of their value in the New Forest, and nationally, ponds are often overlooked in the implementation of legislation designed to protect the freshwater environment (e.g. the Water Framework Directive).

In the Forest, ponds have been created both as a by-product of the historical and modern 'working' of the Forest and as natural features created by the topography and hydrology of the area. Ponds can be as small as $1m^2$ or as large as 2ha in extent and can range from shallow water just a few centimetres deep across the entire pond basin to several meters deep. The naturally formed ponds tend to be very shallow and small and are often part of a complex of ponds in an area of uneven ground.

Figure 3 - New Forest pond types: a small selection of the pond types found in the New Forest – small to large, temporary to permanent - together they support a large number of species, including many endangered species, making the New Forest one of the most important areas for freshwater biodiversity in the UK.

Some New Forest ponds are permanent but the majority are temporary, drying out in most summers but reoccurring in the same location every year following the onset of heavier rainfall. Over 1000 ponds have now been mapped within the New Forest National Park as part of the New Forest Pondscape Strategy. In addition to the ponds (both temporary and permanent) there are many thousands of other pool features which may appear transiently in trackways, mires and wet heathlands. These habitats also support wetland plants and invertebrates, including species that are very important for biodiversity because they are restricted to this specialist habitat type and are rarely found outside traditionally managed habitats such as the New Forest.

Like the streams, many New Forest ponds are naturally very low in nutrients (nitrate <2mg l^{-1}; phosphate <0.01mg l^{-1}). However, this is not always the case: local enrichment from the dung of grazing animals can become concentrated in temporary ponds as they dry down in summer – a feature which is often an essential element in the food chain of these naturally low nutrient systems. Unlike the streams, the great variety of pond types across the Forest means that they range from acidic ponds which are low in calcium, to base-rich ponds with high calcium concentrations, and with high pH. Further complexity of type is added depending on the surrounding habitat type and the degree of shade, and the permanence of the pond and length of time it holds water during the year.

The New Forest catchment also includes 2 lakes (Hatchet Pond and Sowley Pond), both of which were created historically by damning their respective streams to provide power for industry. These shallow, low nutrient lakes are unusual features in southern England and are known to support internationally important plant communities.

4.1.3 Coastal and Transitional Habitats

The coastal, estuarine and lagoon habitats within the New Forest catchment form part of the estuarine system of The Solent which is internationally recognised for its importance for nature conservation. The Solent encompasses over 9,000 ha of intertidal sediment, and includes over 6,000 ha of mudflats, 7,000 ha of sandflats, 400 ha of ancient saltmarsh and nearly 1,800 ha of Spartina marsh. The coastal and intertidal habitats are also rich in invertebrates and as a result support internationally important numbers of breeding and wintering waterfowl and waders.

The Solent Forum is a representative group of stakeholders which have produced strategic guidance documents for the sustainable management of The Solent including its nature conservation. Their review - the state of the Solent can be found on the Solent Forum website[2].

There is currently no standardised methodology for the assessment of coastal and lagoon habitats under the Water Framework Directive, although elements of some waterbodies, e.g. Black Water lagoon and Sowley Marsh have been studied in detail. Instead, their condition has been assessed based on expert judgment. Work is therefore needed to gather evidence for their classification and determine what actions are required to improve their condition.

[2] www.solentforum.org/publications/state_solent/State_of_the_Solent_Edition_3

4.1.4 New Forest Groundwater Waterbodies

Groundwater waterbodies in the New Forest are currently assessed as being of Good status for water quantity. There are no major aquifers underlying the New Forest, but 2 minor aquifers – the South West Hampshire Barton Group and the Central Hampshire Bracklesham Group. Abstractions are limited to small local supplies for agriculture and domestic use; however they could have the potential to impact on the quantity of water available for surface waterbodies and habitats such as streams, wetlands and mires. A Catchment Abstraction Management Plan[3] has been produced for the New Forest to ensure that abstraction licenses are regulated to safeguard the environment.

The water quality of groundwater waterbodies is also considered to be Good, although there have been concerns about local pollution from industry and landfill on the catchment's periphery.

There is a Groundwater Protection Zone in place at Lymington to monitor the activities of users and potential polluters to protect the quantity and quality of the groundwater resource.

4.2 The importance of the New Forest Catchment for freshwater biodiversity

The New Forest is exceptionally important for freshwater and marine wildlife. Collation of data from the Environment Agency, University of Southampton, Pond Conservation, county recorders and national species groups indicate that there are over 400 freshwater macroinvertebrate species (excluding Diptera) in the New Forest catchment – over a third of the UK total. The area is also significant for freshwater wetland plants with over 300 species recorded (two thirds of the UK total). This is much richer than most other areas in lowland England because the New Forest is a vast traditionally managed non-intensive landscape which is largely free from polluting influences such as agricultural fertilisers and urbanisation. In other words, the New Forest has an abundance of clean water habitats – habitats which are otherwise difficult to find across most of Britain.

The quality of these freshwater habitats means that they not only support a high number of species but also a large proportion of the UKs freshwater species of conservation concern (around 30%) – species which have declined elsewhere because of habitat loss and habitat degradation (Figure 4). In recognition of this, much of the New Forest catchment is protected by national and international legislation – the New Forest Special Protection Area and Special Area of Conservation.

Within the Forest a large proportion of all freshwater plants and animals (80% of all freshwater invertebrates), including most endangered species, are associated with the ponds (Figure 5 and 6). They support: 75% of England's Red Data Book pond species (species whose distribution is restricted and declining elsewhere); just under 50% of England's pond associated Biodiversity Action Plan species; just under 50% of Wildlife and Countryside Act pond associated species and 30% of England's Nationally Scare pond invertebrate and plant species. Current water management policy does not reflect the value of these standing water habitats. At present, both nationally and in the New Forest, water management policy, particularly the WFD, focuses on protecting and improving the condition of rivers and, with a few exceptions, does not cover ponds and lakes less than 50ha in size.

[3] Environment Agency (2007) New Forest Catchment Abstraction Management Strategy. http://cdn.environment-agency.gov.uk/geso0307bmbo-e-e.pdf

Figure 4 - New Forest Biodiversity Action Plan species - Coral Necklace, Pillwort, Southern Damselfly, Marsh Clubmoss, One-grooved Diving Beetle, Bullhead, Yellow Centaury, Mud Snail, Tadpole Shrimp, Starlet Sea-anemone and Eel

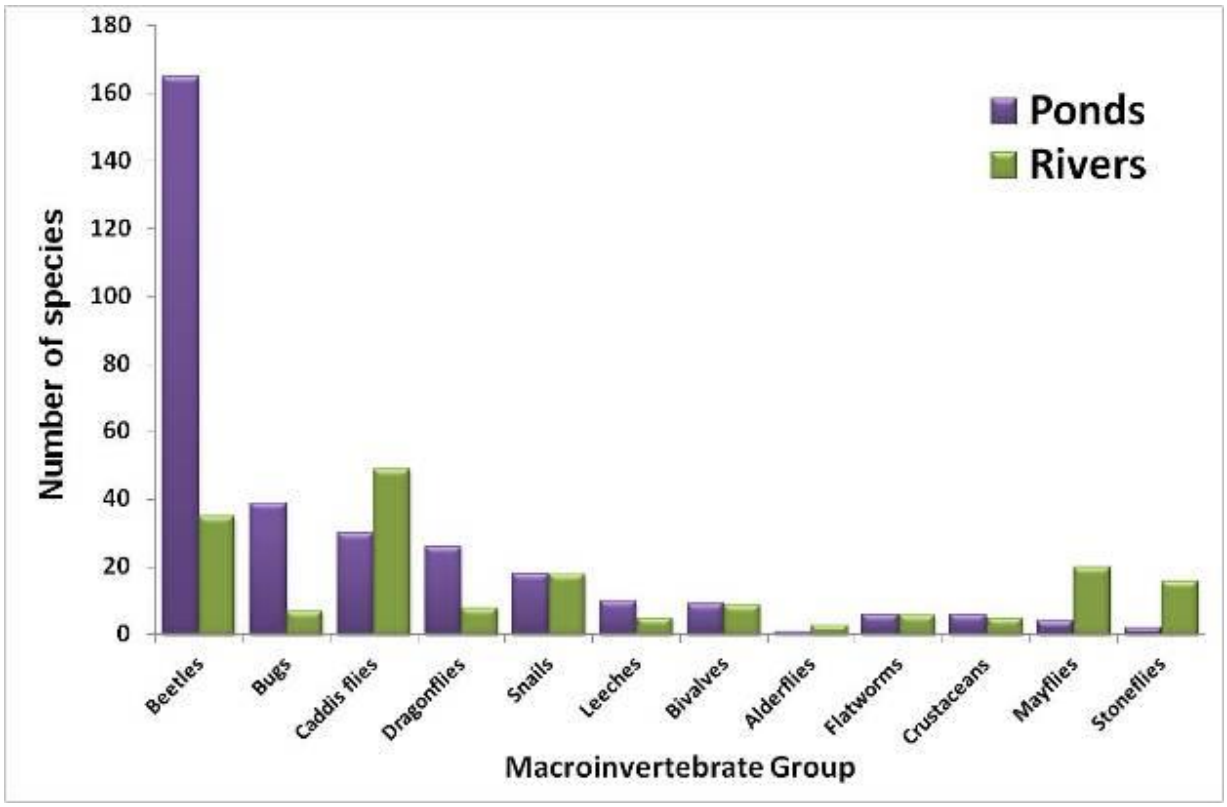


Figure 5 - New Forest macroinvertebrate species

Macroinvertebrate species in New Forest ponds and streams – ponds are important habitats for many groups e.g. beetles, bugs and dragonflies, while streams are important for caddis flies, mayflies and stoneflies.

Ponds and streams also support high numbers of Species of Conservation Concern (SOCC) (calculated using totals for plants, invertebrates and vertebrates).

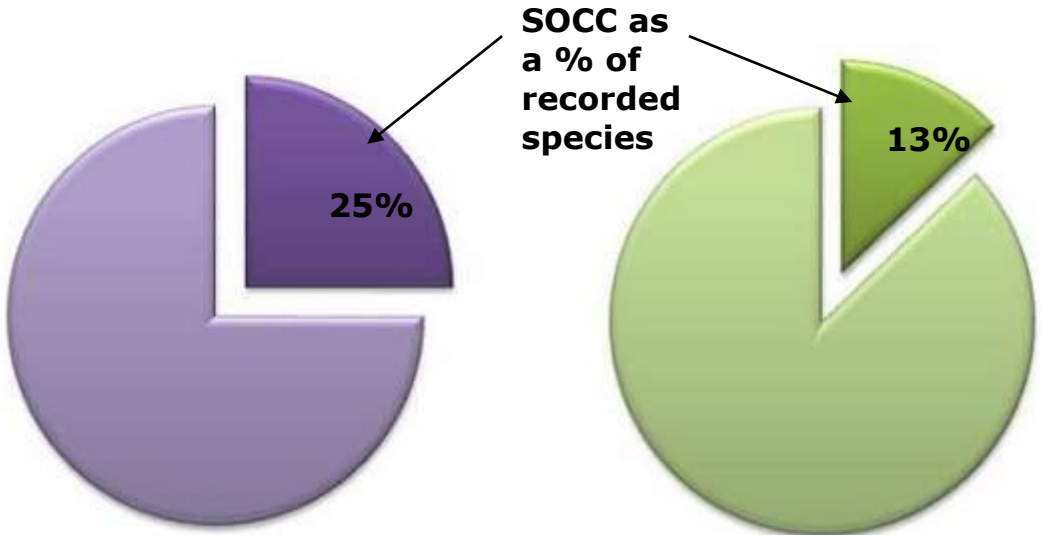


Figure 6 - Species of Conservation Concern

5 Catchment-wide issues and initiatives

In England and Wales, 75% of freshwaters (excluding headwater streams, ditches, and ponds) fail to meet the minimum standards for Good ecological quality[4]. In some agricultural landscapes this is even worse, with 95% of freshwaters showing biologically damaging levels of pollution. Coastal waters and habitats are also under threat with 75% achieving Moderate or lower status. Across the wider countryside, ponds are also often degraded with 80% in Poor or Very Poor condition.

In the New Forest, and particularly within the New Forest Special Area of Conservation, the situation is much better than the norm with many ponds, rivers and streams of much higher quality than is usual for lowland Britain – 42% are currently assessed as experiencing low but acceptable levels of pollution or modification.

However, although most rivers and lakes in the New Forest are largely unpolluted there are other threats. Thus, none of the waterbodies are currently classified as having High ecological status, many important smaller bodies of water are not protected by legislation and biologists are worried that the special features of the New Forest's freshwaters are in decline. Where the rivers flow through towns and farmland they are often more seriously degraded – pollution from urbanization and intensive agriculture has significant impacts on freshwaters. These terrestrial sources of pollution then flow out to sea where they impact negatively on our coastal environments.

As the lead authority for Water Framework Directive delivery in the UK, the Environment Agency has already begun investigations to improve our understanding of the reasons for Water Framework Directive failures and the actions needed to resolve them. They have undertaken several stakeholder meetings since the mid 1990's to prioritise issues affecting the water environment in the New Forest. The Catchment Development Group for the New Forest Catchment Pilot Project reviewed the outcomes of the previous meetings to determine which issues and actions were still relevant and whether there were any new priorities for stakeholders.

The consensus of opinion was firstly the importance of river, pond, lake and coastal habitats in the New Forest catchment for biodiversity, which means that we must achieve the highest standards possible for all freshwater and marine habitats. Secondly, it was agreed that previous stakeholder meetings had identified *what* broad issues were impacting on the water environment in the New Forest and that this project should therefore focus on identifying *where* actions needed to be delivered to achieve positive gains for biodiversity on the ground.

---

[4] To assess the condition of inland and coastal waters biologist and chemists make careful and precise measurements of:

- The variety of plants, invertebrates and fish living in the water.
- The amount of water pollution: for example oxygen and nutrient levels, temperature and pesticides.
- In rivers, lakes and coastal waters (but not the ponds and smaller headwaters): the physical structure of waterbodies habitat, the presence of unwanted weirs and dams, and whether there is a near natural amount of water in the waterbody at the right times.

This information is used to describe the 'ecological status' (High, Good, Moderate, Poor or Bad) of the whole waterbody. It is determined by the poorest element - the one out all out policy of the Water Framework Directive.

This section of the report briefly reviews the current threats identified for the New Forest and projects which are currently underway to research, monitor and address these issues.

5.1 Water Quality

We know that water quality is one of the most important requirements for healthy freshwater, coastal and groundwater waterbodies. The headwater streams and ponds in the New Forest's unimpacted catchments have the potential to retain very high standards for water quality and may represent near natural conditions. However, these habitats may also be particularly sensitive to pollution because they are naturally low nutrient systems. Downstream stretches are unlikely to be entirely free from pollution due to the presence of development and agriculture and efforts need to focus on resolving specific point source and diffuse pollution issues where they occur.

5.1.1 Waste Water Discharges

A number of Waste Water Treatment Works discharge into streams and rivers which flow through urban centres within and on the periphery of the New Forest. Large works servicing the bigger towns have limits on discharges and employ technology e.g. phosphate and nitrate scrubbing, to ensure they are within set limits. Smaller works do not have to impose limits due to the relatively smaller volumes being discharged and may employ reedbed filters to reduce pollutants entering the river. Some works are licensed for emergency discharges under storm conditions or in the event of power failure which could cause environmental damage.

In rural areas, the number of unregulated discharges from septic tanks with inadequate soakaway facilities or direct discharges into ditches and rivers could be significant. Householders can register with the Environment Agency for a non polluting domestic discharge but many have not.

In urban areas, misconnections for the disposal of foul domestic waste may cause polluted water to be discharged into rivers and streams through the surface water drainage system. This is thought to apply to around 2% of households in the UK and could have significant implications for water quality at a local level, but the evidence for exactly where and how often this occurs is not currently available in the New Forest.

A review of monitoring data by the Environment Agency will provide a clearer picture of water quality issues, but detailed testing across the catchment would be required to pinpoint specific sources away from waste water treatment works. Local communities and councils can help to increase the extent and frequency of simple monitoring, and promote schemes to reduce pollution from households. The planning authority also has a responsibility to ensure that there are adequate discharge facilities for new developments and to consider the proximity of new development to sensitive waterbodies, especially in light of the growing population in the New Forest.

Existing Initiatives

Through the **Asset Management Planning** (AMP) process the Environment Agency is currently reviewing monitoring data to determine whether more stringent limits and investment are required to make further improvements to the water industry. In addition, recent planning strategies (e.g. the Core Strategies for the New Forest District and New Forest National Park) take account of planned population growth and contain policies to reduce pollution in development decisions.

National initiatives have also provided resources to help address misconnections and pollution from domestic discharges such as the '**Connect Right**' website. There is scope to promote these more actively on a local scale.

5.1.2 Diffuse Pollution

The impact of pollution from Waste Water Treatment Works on the aquatic environment is well understood and a legislative framework is in place to identify and resolve pollution incidents once identified. The impact of more diffuse pollution from agricultural and urban areas is less understood and often unregulated.

Polluted runoff from farmland, including phosphates, nitrates, sediments and pesticides may be washed into streams and ponds from fields (arable, horticulture and livestock) and farm and stable yards. Significant pollution incidents can be detected and dealt with under the legislative framework, but the cumulative effect of many smaller sources often goes undetected, even though, combined, they may have a significant effect on freshwater biodiversity. Agricultural runoff may be particularly significant in the eastern streams and ponds of the New Forest outside of the Special Area of Conservation, but may also occur where waterbodies take runoff from fields on the boundary of the protected area.

Diffuse runoff from roads, car parks and industrial areas, can include oils, salts, sediments (including those washed from agricultural areas) and heavy metals. In urban areas, the surface water drainage system often includes gullies to trap sediments and some pollutants before being discharged into water courses. The effectiveness of these systems is dependent on regular maintenance and even then the degree to which they reduce pollution is not well understood. In rural areas, roads usually drain into ditches which eventually connect to the stream network. Their ability to reduce pollution reaching the main river channel is also not well studied but is thought to be dependent on ditch gradient (to slow down the flow of water) and the growth of vegetation (important in trapping sediments). Some ditches in the New Forest are connected to pond habitats and there is evidence that these ponds may be declining in quality as a result.

Existing initiatives

Agri-environment grant schemes provide opportunities for landowners and land managers to reduce diffuse pollution. Whilst some landowners have a great deal of expertise to plan operations to minimise impacts and utilize such schemes, others will benefit from advice on techniques and grants.

In the New Forest, the Forest Friendly Initiative ran from 2001 to 2008 to successfully deliver such advice. Since then the **New Forest Land Advice Service** has become a one-stop-shop for free and independent advice on agri-environment schemes. Along with Natural England, they have already worked with a number of landowners in the New Forest to help them develop effective plans for reducing inputs and runoff to the water environment.

The Forestry Commission's **English Woodland Grant Scheme** (EWGS) includes enhanced support for woodland creation where it is shown that water quality can be improved by such planting.

5.1.3 Pollution in the marine environment

Land based pollution enters the Solent via the rivers and streams draining the New Forest and it is likely that this is having a negative impact on the marine environment. Private and commercial boat users may also contribute to this pollution through the inappropriate disposal of sewage, oil and cleaning products.

Existing initiatives

The **Solent Forum** is working towards a stakeholder led plan for sustainable planning in the Solent. In particular its Water Quality Subgroup (Solent Water Quality Association) considers issues relating to pollution and helps ensure coordination between relevant agencies and organisations. Events such as a water quality conference in 2010 have sought

to raise awareness and agree actions. The group also coordinates the annual Solent Water Quality Awards.

The New Forest District Council set up and now chairs the **New Forest Environmental Protection Liaison Committee** which collates information on local activity relating to potential pollution, particularly the Waterside and seeks to disseminate this to other partners and the public.

Harbour Authorities and local sailing clubs undertake awareness raising initiatives to ensure appropriate disposal of sewage and other materials. They are supported by national initiatives such as '**The Green Blue**' website and environmental programme and Marina toolkit.

Within marine European sites competent authorities coordinate management of activities likely to have impacts such as pollution via the **Solent European Marine Sites Management Scheme**.

5.2 Water Quantity

Many ponds and headwater streams dry out periodically during low summer flows as part of a natural process. In some cases such drying helps to support important plant and invertebrate communities and stabilising water levels, for example by deepening temporary ponds or connecting them to the ditch network, can be very damaging to their specialist communities.

Natural seasonal drying is less likely in streams fed by valley mires, where the surrounding habitat acts like a sponge during the winter; continuing to feed streams gradually throughout the summer. Sudden or unexpected drying of more permanent streams may cause damage to their communities which have not evolved to tolerate these conditions and may exacerbate water quality issues – by reducing the volume of water for dilution during a time when the population of the New Forest increases (summer tourism).

There are 50 licensed abstractions taking up to 2.3 million cubic metres per year, around two thirds of which comes from groundwater sources and a third from surface waters. Abstractions are small with the majority used for agriculture/horticulture, industry and local public water supply. As a result, groundwater waterbodies in the New Forest are assessed as being Good for water quantity.

Existing Initiatives

The first step to protect the hydrology of groundwater and surface water bodies, has been the production of the **New Forest Catchment Abstraction Management Strategy**. But, further evidence is needed to determine the extent of unnaturally low summer flows, the underlying issues and the measures required to reduce this effect, particularly in light of future climate change.

5.3 Habitat Modification

5.3.1 Straightening of watercourses

New Forest streams are naturally shallow and meandering. However, all have undergone some form of modification, to increase drainage for forestry, for grazing land or to speed runoff from urban areas. In some streams this has resulted in an over deepened channel, loss of in-stream habitat diversity and loss of floodplain features.

In extreme cases, historical stream modification continues to cause headward erosion of valley mires (as much as 1m per year) and may increase the risk of flooding downstream.

Flood risk in the New Forest has been assessed in the **New Forest Catchment Flood Management Plan**.

Stream and mire restoration work by the Forestry Commission, in conjunction with other partners and stakeholders, has been underway for the last 15 years to improve the status of designated sites within the Crown Lands of the New Forest and reduce flood risk. This work includes the removal of artificial drainage and restoration of straightened river sections to a more natural river course. Future restoration plans for rivers in the Crown Lands have been documented in the **New Forest Wetland Management Plan 2006 – 2016**.

Several urban streams have been effectively converted into drains for the town and as a result are much reduced in their value for biodiversity. These streams are classified as Heavily Modified Waterbodies (HMWB) under the Water Framework Directive and many cannot be returned to their original form. The aim for these waterbodies is to improve their ecological condition as much as possible whilst maintaining their use – in other words ensuring that they are as free from pollution as possible, which is difficult in an urban environment, and where possible investigating the potential to restore straightened stream sections, provided it does not increase flood or erosion risk.

To determine the effectiveness of restoration schemes in both semi-natural and urban habitats and their impact on freshwater biodiversity, erosion and flood risk, a greater number of detailed monitoring studies are required.

Existing Initiatives

Currently the Forestry Commission lead works to address the harmful effects of channel straightening within the Crown lands as part of the **New Forest Higher Level Stewardship Scheme.** This builds on previous work by partners including the Environment Agency as part of the **LIFE 2 and LIFE 3 Projects** which has also sought to undertake research and monitoring on this issue.

Contractors are currently surveying modified streams and mires as part of the New Forest Higher Level Stewardship Scheme and will recommend a programme of monitoring to determine the effectiveness of restoration schemes.

5.3.2 In-stream structures

Physical structures including e.g. culverts, closed watercourses, pinch points, sluices and weirs can reduce in-stream habitats and create an obstruction to fish migration. These modifications can be removed if their original use is no longer required or alternatives will be sought which continue to serve their purpose whilst causing as little damage to the environment as possible.

The importance of some structures in maintaining the current condition of habitats whilst serving a water regulation function is not always known, e.g. tidal sluice gates, and investigation and monitoring will be required to determine the best mitigation measures for these structures.

Existing Initiatives

The **Lymington River Reedbed Water Level Management Plan** seeks to manage the controlled introduction of tidal water upstream, replacing the tidal flap with a self-regulating tidal gate. It was intended this would also assist fish passage by removing obstacles. Research into the effects of the management changes is ongoing.

5.3.3 Coastal defences

Future sea level rise will have a significant effect on the low lying coastal areas of The Solent. The way that this is managed will significantly affect the biodiversity of nationally

and internationally important coastal and transitional habitats and have implications for landowners in the region. This issue has been reviewed in detail by the Solent Forum during the development of the **North Solent Shoreline Management Plan**.

Existing initiatives

The New Forest District Coastal Group are involved in a wide range of coastal management initiatives and research programmes in partnership with a number of national and regional organisations. It is widely regarded as leading the way in best practice for integrated coastal zone management and produced the **North Solent Shoreline Management Plan** in December 2010 following extensive partnership and stakeholder consultation.

5.4 Habitat Management

5.4.1 Forestry management

Forestry operations can have significant adverse effects on water quality and quantity. Concern have been expressed in previous catchment stakeholder reviews that the streams and waterbodies in afforested areas of the New Forest were likely to be negatively impacted by forestry operations.

More recently, following the publication of the UK Forestry Standards (UKFS) and guidance for sustainable forestry, including **'Forests and water (2011)'**, there is a requirement to follow legal regulations and good working practices to reduce the impact of operations on the water environment.

Existing initiatives

Forest Design Plans (FDPs) are the way that the Forestry Commission strategically plans its medium to long-term (20-100 years) management of the public estate. They explain both how and why the Forest is to be managed and are based on the expert opinions of individuals, organisations and local people to ensure that management protects and enhances the value of New Forest habitats. It will be possible to integrate planning for the protection and improvement of the water environment through these plans. Operational Plans and Operational Site Assessments help deliver the FDPs on the ground.

5.4.2 Debris dams

The formation of debris dams (piles of woody debris that block watercourses) is a natural process and is thought to be an important part of the in-stream habitat structure of streams and rivers in the New Forest. Concerns have been raised by ecologists regarding the clearance of debris dams as a management tool (for flood prevention and fishing purposes) and its impact on stream biodiversity.

Research has shown that naturally forming debris dams are unlikely to limit the movement of fish or have a significant negative impact on streamside habitats. In contrast, removal of natural habitats such as debris dams is likely to have a negative impact on the communities which have developed within them.

More recently, debris dams have been created as a tool to enhance biodiversity during river restoration projects. However, work by the University of Southampton suggests that creating debris dams may benefit some fish species whilst reducing habitat suitability for others, because the presence of dams will change in-stream morphology.

This would suggest that dams should be left in-situ where they have formed naturally but should not be used as a default option in stream restoration without first considering the impact on the species supported by existing habitats prior to restoration.

Existing Initiatives

The **New Forest Special Areas of Conservation (SAC) Management Plan** establishes principles in relation to debris dams and a protocol for the **management of debris dams in New Forest water courses** was jointly produced by the Forestry Commission and Environment Agency as part of LIFE 3.

The **Open Forest Advisory Committee** chaired by the Forestry Commission provides a forum for discussion of management and impacts on stakeholders which may include dams where they are perceived to be a threat to other factors such as grazing resource or access. Issues relating to debris are considered as part of planning for river restoration works which involves a range of Forest organisations and stakeholders.

5.4.3 Recreation management

The impact of recreation on the rivers, streams, ponds and lakes of the New Forest is a contentious issue but one which has been raised during previous catchment stakeholder workshops and continues to be raised as a potential issue in this review. Visitor pressure at popular sites may result in erosion which can directly damage habitats and may also increase sedimentation and turbidity. Nutrient enrichment from dog fouling and activities such as duck feeding and fishing can also occur at heavily used sites. There may also be increased risk to waterbodies adjacent to car parks from oils and other road runoff.

In spite of the concerns raised, there is little evidence of the impact of these activities on freshwater habitats in the New Forest. This makes it difficult to present a case for a change in recreation management where perceived problems are occurring and may result in the gradual decline of internationally important habitats due to a lack of action.

Existing initiatives

The **Recreation Management Strategy** sets out the the strategic direction for the management of outdoor recreation in the New Forest National Park from 2010 – 2030.

The Strategy seeks to guide and influence recreation and spatial planning policy and implementation across the whole of the National Park and adjoining areas. It is intended it will be reviewed every five years. A sub-group of stakeholders considers and informs evidence gathering and research.

Wider stakeholders also promote research, the Hampshire Wildlife Trust in particular have assisted undergraduate and postgraduate research studies into erosion at particular hotspots for recreation adjacent to rivers and streams.

5.4.4 Pond management

Permanent and temporary ponds are some of the most important freshwaters in the New Forest, supporting more species and more rare species than other habitats. Historically mismanagement of some ponds has led to the loss of key features – e.g. deepening temporary ponds to make them permanent, removal of trees to create open ponds, connecting ditches to ponds to provide a source of water and fencing ponds to exclude stock. This has often been driven by a desire to fit one set of prescriptions to the management of ponds – resulting in ponds across the landscape which look the same.

We now know that the value of New Forest ponds is the wide variety of pond types managed by extensive traditional grazing. This makes it difficult to apply a one size fits all to pond management. In fact, in many instances natural succession is the preferred option (a

process which is very slow in the New Forest due to the presence of grazing stock), using pond management only when it is needed to protect isolated populations of rare species.

Existing Initiatives

The **New Forest Pondscape Strategy** has been developed by Pond Conservation to provide a traffic light system to the management of New Forest ponds. This strategy will provide guidance to protect pond species from damaging management operations and suggest options for enhancement of the pond network.

The initiatives has already carried out extensive survey, liaison with landowners and provided local training to stakeholders.

5.5 Invasive Non-native Species

Non-native species of plants and animals pose a significant threat to the biodiversity of the UK. Aquatic invasive species have invaded a number of different freshwater and coastal habitats in the New Forest and the concern that they may damage habitats and outcompete vulnerable native species has been raised in all previous reviews.

Existing Initiatives

In 2009, the **New Forest Non-native Plants Project** was set up to research, monitor and control non-native plant species. More information about the project can be found here. The project has been particularly successful in engaging local support for voluntary action such as pulling Himalayan balsam and gaining the engagement of landowners on a catchment scale.

Table 1 - Summary of issues and existing initiatives

Issue	Initiative/ Project	Organisation	Website
Water quality	Asset Management Planning	Environment Agency	www.environment-agency.gov.uk/cy/busnes/sectorau/33069.aspx
		New Forest Environmental Protection Liaison Committee	
		New Forest Land Advice Service	www.nflandadvice.org.uk
		Solent Forum	www.solentforum.org
	Connect Right		www.connectright.org.uk
	The Green Blue		www.thegreenblue.org.uk
	Solent European Marine Sites Management Scheme		www.solentems.org.uk
Water quantity	New Forest Catchment Abstraction Management Strategy		http://cdn.environment-agency.gov.uk/geso0307bmbo-e-e.pdf
Habitat modification	New Forest Catchment Flood Management Plan		http://cdn.environment-agency.gov.uk/geso1008bowa-e-e.pdf
	New Forest Wetland Management Plan 2006 - 2016		www.newforestlife.org.uk/life3/PDFs/PDFs/9.24NFWetlandMgtPlan.pdf
	New Forest Higher Level Stewardship Scheme		www.hlsnewforest.org.uk
	New Forest LIFE Projects		www.newforestlife.org.uk
	Lymington River Reedbed Water Level Management Plan		www.hwt.org.uk/pages/lymington-river-reedbed.html

Table 1 - Summary of issues and existing initiatives (cont.)

Issue	Initiative/ Project	Organisation	Website
Habitat modification (cont.)	North Solent Shoreline Management Plan		www.northsolentsmp.co.uk/index.cfm?articleid=6554&articleaction=nthslnt&CFID=10929116&CFTOKEN=75614263
Habitat management	Management of debris dams in New Forest water courses	Environment Agency and Forestry Commission	www.hlsnewforest.org.uk/__data/assets/pdf_file/0004//Environmental-Impact-Assessment-Appendices.pdf
	Forests and water 2011	Forestry Commission	www.forestry.gov.uk/pdf/FCGL007.pdf/$FILE/FCGL007.pdf
	Forest Design Plans	Forestry Commission	www.forestry.gov.uk/forestry/INFD-6A4KRT
	New Forest Special Area of Conservation (SAC) Management Plan	Natural England	www.newforestlife.org.uk/life2/managementplan.htm
	New Forest Pondscape Strategy	Pond Conservation	www.pondconservation.org.uk
	Recreation Management Strategy	New Forest National Park Authority	www.newforestnpa.gov.uk/about-us/our-work/recreation-management-strategy
		Open Forest Advisory Committee	
Invasive non-native species		New Forest Non-native Plants Project	www.hwt.org.uk/pages/new-forest-non-native-plants-project.html

6 A Vision for the New Forest Catchment

In the New Forest we have the opportunity to protect and restore freshwater and coastal habitats to the ***very highest standards.*** This is possible in the New Forest because:

- evidence on the status of the New Forest habitats has been gathered by statutory and non-statutory agencies and species experts for many years
- the small scale of many waterbodies means that there is considerable potential to resolve pollution issues
- landowners and communities understand the special nature of the Forest and are willing to take action
- there are already networks and links between key stakeholders and existing projects which have the potential to implement action

The Catchment Development Group's vision is to go further than the Water Framework Directive by including ponds, small lakes, headwaters and mires and aiming to improve to ***High*** status, where this is achievable.

6.1 How and where will we achieve these standards?

Freshwaters, estuaries and inshore waters, are exposed to many threats and controlling them all is difficult. To do so will take a coordinated action within sub-catchments using the following approach:

1. Identify and protect the best

- Analyse existing datasets and collate information from published and unpublished sources.
- Collect additional information if the habitats we know to be important are not currently monitored e.g. ponds and headwater streams.
- Monitor parameters we perceive to be causing a problem if they are not currently monitored.
- Identify smaller units than currently used by the Water Framework Directive, for example headwater streams achieving high status compared with downstream stretches of the same waterbody which are currently classified as Moderate under WFD criteria.

2. Build out from the best areas to strengthen important populations and encourage species dispersal.

- Use a strategic coordinated approach in the management of river catchments rather than ad hoc work over a large area.
- Use both management / restoration of habitats and creation of new habitats to sustain and build populations.

3. Recreate the scarcest of all resources – clean water

- Reduce pollution from pipe sources, such as Waste Water Treatment Works and diffuse pollution from agricultural and urban areas.
- Where it is not possible to reduce pollution below the levels needed for a healthy freshwater environment, create new clean water habitats to replace the waterbodies which have been lost.

A summary sheet of management and restoration options has been produced to communicate with relevant stakeholders and interested parties. This can be found at Appendix A.

PART III – New Forest sub-catchment analysis and plans

Part III of this report is a dynamic working document and will grow. It provides a structure to work from and will be built on as more sub-catchments are addressed, issues are identified and activities take place or undertaken. The approach takes as its starting point Water Framework Directive waterbody failures. The Environment Agency has produced technical summary sheets for these failing waterbodies which are directed at improving the failing elements which prevent them from reaching Good status or Good potential, if a heavily modified waterbody eg. to prevent flooding. We are initially prioritising those waterbodies which are failing. The classification of waterbodies shown in Part III relates to their classification in the South East River Basin Management published in 2009.

Due to the critical importance of the New Forest, Part III reflects our ambitions to go further than the basic Water Framework Directive requirement for achieving 'Good' status by aiming for High status where it is achievable and extending our work to cover ponds, headwaters, small lakes and mires. It also tackles the wider issues of water environment improvement important to stakeholders, together with developing appreciation and ownership by local communities to foster its long-term care.

The activities and actions that have been undertaken or are planned are summarised together with the more detailed activity documents produced being referenced, including the Environment Agency's waterbody summary sheets.

7 Sub-catchment Groups

The New Forest catchment waterbodies have been split into the following geographical groups:

New Milton
Lymington River
Beaulieu Heath
Beaulieu River
Lepe
Waterside
Bartley Water

7.1 New Milton Group

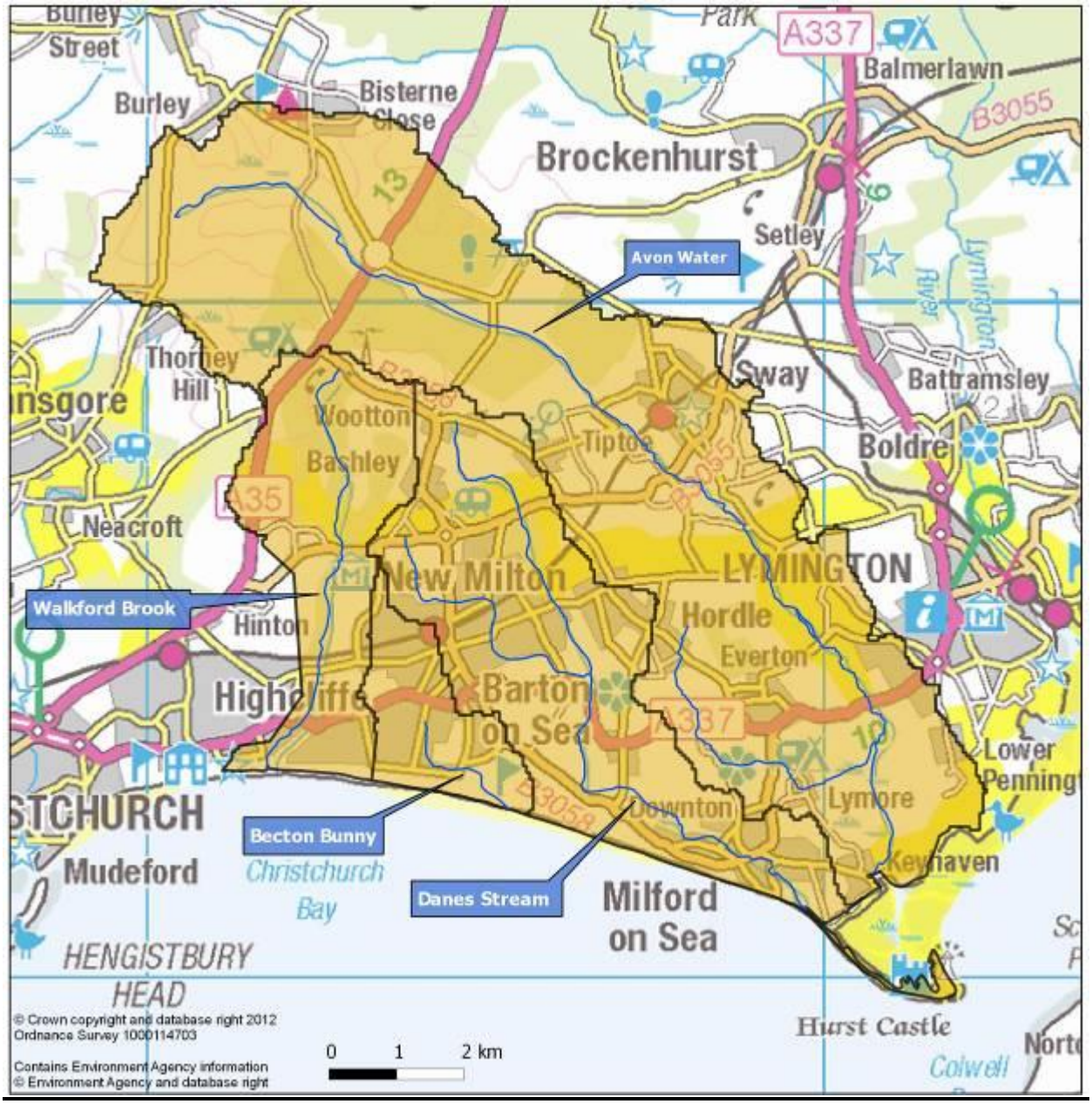


Figure 7 - New Milton Group map

These streams flow through and around the New Milton area. They are generally of low water volume but rise and flood very rapidly and are considered flashy.

7.1.1 Walkford Brook

7.1.1.1 Description

This brook rises in the mires, heath and inclosures of Crown Land in the Wootton area above New Milton. In the upper half of its catchment it flows through three main arms along narrow wooded valleys bordered by arable and pasture land. In these upper reaches there are many on and off stream ponds both within private estates and Forest inclosures. The streams come together in the lower half of the catchment again flowing through a narrow wooded valley until reaching the railway line where the brook enters the grounds of a large hotel which contain ornamental ponds. On reaching the main Christchurch Road it flows over a weir entering the Chewton Bunny chine bordered by a holiday camp and a residential area, before entering the sea at Highcliffe.

7.1.1.2 Initial Identification of Issues

The South East River Basin Management Plan (2009) waterbody covering this area is

a) GB107042011270 Walkford Brook - Good status

The following issues have been identified by the Environment Agency or have been raised by stakeholders:

- Possible in-stream obstructions to fish

7.1.1.3 Potential Local Stakeholder Liaison

The following local stakeholders will need to be considered:

Local Councils – New Milton Town Council / Bransgore parish / Christchurch Borough Council
District Council – New Forest District Council
Chewton Glen Hotel
Forestry Commission
Horticultural Nurseries
Farming Estates
Caravan & Holiday Parks
Residents Associations

7.1.1.4 Activities and Action

The following activities and actions have taken place or are planned to improve the water environment in this catchment:

- Not yet addressed

7.1.2 Becton Bunny

7.1.2.1 Description

This quaintly named stream is almost totally urban along its length. It rises in the Gore Road industrial estate of New Milton before flowing underground, culverted and heavily modified for flood defence purposes, through the built up area of Barton-on-Sea. For much of this length it is bordered by a public footpath between houses. It then enters a public recreation ground where it has been straightened and deepened before crossing in to Barton-on-Sea golf course. Within these grounds there are two on-line ponds and the stream is joined by a small tributary from Barton Common. It leaves the golf course flowing into the sea after passing through Becton Bunny chine which has been heavily reinforced to prevent its continued retreat inland.

7.1.2.2 Initial Identification of Issues

The South East River Basin Management Plan (2009) waterbody covering this area is

a) GB107042011260 Becton Bunny - Moderate potential

The following issues have been identified by the Environment Agency or have been raised by stakeholders:

- Water quality issues possibly due to sewerage/drainage house misconnections, urban run-off and sedimentation
- Urban physical changes to the watercourse and obstructions
- Invasive non-native plants

7.1.2.3 Potential Local Stakeholder Liaison

The following local stakeholders will need to be considered:

Local Councils – New Milton Town Council
District Council – New Forest District Council
HCC Highways
Hampshire & Isle of Wight Wildlife Trust – New Forest Non-Native Plants Project
Barton-on-sea Golf Club
Southern Water Services
Residents Associations

7.1.2.4 Activities and Action

The following activities and actions have taken place or are planned to improve the water environment in this catchment.

Overview
The Becton Bunny is a heavily urbanised catchment, especially in its upper half. However, in the lower reaches it has an open but still modified profile flowing through a public open space and eventually out through Becton Bunny Chine to join the sea. A couple of side streams flow through Barton Common to join the main channel and these have a different character again, being both modified and shaded.

Figure 8 - Becton Bunny stream reach illustrations

Desk-top familiarisation

- Analysis of monitoring data collected by the Environment Agency 1979-83 and 1990-06, show that although physico-chemical standards for Good status were met in 2006, invertebrates were classified as moderate indicating that there may intermittent failures associated with sewage/urban drainage issues.

- This was supported by historical fluctuations in water quality data, with occasional failures below the minimum standards for the Water Framework Directive i.e. occasional Moderate status since 2002 for some chemical parameters.

Provisional catchment walkovers

- Identification of potential problems and initial water sampling using conductivity as a guide to identify water quality issues.
- Conductivity was high (indicating high nutrient levels) in the upper catchment, followed by increasingly higher levels downstream. The golf course ponds may be acting as a sink to sediments as conductivity levels below the pond were almost half the levels recorded above the pond. The lowest catchment readings were from Friars Walk, whilst the highest readings were recorded from the side stream flowing from Barton Common Lane.

Technical summary produced

- A Technical Summary (available at Appendix A) and Issues Map (Figure 9) were produced as a communication tool with which to liaise with landowners and other interested parties.

Liaison with local communities and other interested parties

- Meetings held with key stakeholders to discuss issues identified in catchment walkovers to determine stakeholder priorities.

Follow-up catchment walkovers

- Detailed walkover of the Becton Bunny following discussion with stakeholders to identify specific water quality, structural and morphological problems and potential remedial actions.
- Results for water quality from the second visit (phosphate and nitrate), reveal high nitrate levels from Mitchell Close and the top of Chewton Common to the sea, and confirm intermittent issues relating to phosphate levels. Readings taken during the site visit before and after heavy rain show elevated phosphate levels in storm runoff.

Figure 9 - Becton Bunny provisional catchment walkover

Relevant initiatives

- We have worked with the Environment Agency WFD Stage 3 working group to ensure a co-ordinated approach to taking action in the Becton Bunny.
- We have provided supplementary information and raised stakeholder priorities with the Environment Agency, to inform a contract to investigate pollution sources and produce a feasibility study for restoring natural channel form and flows.
- We are working with the New Forest Land Advice Service and the Friends of Long Meadow Group to produce a management plan for the open space.
- We are liaising with the Community Wildlife Plans Project who are working with local communities in this sub-catchment to produce a local wildlife plan and New Milton Town Council in respect of an effective management plan for cutting regimes.
- We are working with New Forest National Park Authority education officers to facilitate field visits by local schools to the Becton Bunny as part of their national curriculum work

Catchment actions for the Becton Bunny

Monitoring

- Use data gathered from Environment Agency investigations to inform river management and restoration programmes.
- Provide training in simple monitoring techniques for local community groups and schools to increase the scope and frequency of monitoring.

Water quality

- Engage with the local authority to create clean water habitats i.e. ponds in the catchment.
- Identify sources of pollution from industry and houses with misconnections and work with local communities, residents association, Southern Water Services and the Environment Agency where necessary to remedy.
- Check the function of road gullies to reduce sediment runoff from roads and work with Hampshire County Council to remedy.

Restore river morphology

- Engage with the local community and golf course to restore river form and flow downstream of Mitchell Close, where modeling shows that this does not increase flooding risk or erosion.

Management

- Work with the local authority, residents association and Long Meadow management group to change management to increase bankside and in-stream vegetation.
- Work with the local authority, residents association and riparian owners to identify areas where scrub could be removed to increase growth of bankside vegetation.

Invasive plants

- Work with the golf course, Environment Agency and New Forest Non-native Plants Project to eradicate Creeping Water Primrose.
- Contact the nursing home to advise removal of non-native Giant Rhubarb in favour of native streamside plants.

Wider catchment action delivery

The Becton Bunny will never achieve High ecological status because of the extent of historical modification for drainage within the urban setting. However, it should be possible to achieve the minimum standards for a Heavily Modified Waterbody i.e. Good Potential.

Many of the streams which flow east into Southampton Water face similar issues to the Becton Bunny and it can therefore be used as a best practice example which can be rolled out to these catchments in the future.

7.1.3 Danes Stream

7.1.3.1 Description

This stream rises in the Wootton and Bashley areas flowing through significant areas of woodland on its immediate floodplain bordered by small-scale farmland for much of its length. There are also a large number of off-line ponds and a series of commercial fishing lakes. The mid reaches of the stream separate the housing estates of the Hordle and Ashley communities. In its lower reaches the stream passes through Downton and then enters Milford-on-Sea where it has been significantly modified for flood defence purposes. Before entering the sea at Keyhaven through a European designated site it passes through Sturt Pond which is a Local Nature Reserve.

7.1.3.2 Initial Identification of Issues

The South East River Basin Management Plan (2009) waterbody covering this area is

a) GB107042011170 Danes Stream - Good status

The following issues have been identified by the Environment Agency or have been raised by stakeholders:

- None yet identified

7.1.3.3 Potential Local Stakeholder Liaison

Local Councils – New Milton Town Council / Milford-on-sea parish
District Council – New Forest District Council
Hampshire & Isle of Wight Wildlife Trust – New Forest Non-Native Plants Project
Residents Associations

7.1.3.4 Activities and Action

The following activities and actions have taken place or are planned to improve the water environment in this catchment.

- Not yet addressed

7.1.4 Avon Water

7.1.4.1 Description

The headwaters of this New Forest stream rise in the mires south of Burley and its course contains abundant pool and riffle features, meanders and other aspects of natural water course development. The upper half of the stream flows through Crown heathland and inclosures before reaching Sway. Here the character changes and it passes through grazing fields and small hamlets and beyond Everton enters areas of low lying fields and grazing marsh. It flows into the sea through the nature reserve at Keyhaven where there are tidal gates.

7.1.4.2 Initial Identification of Issues

The South East River Basin Management Plan (2009) waterbody covering this area is

a) GB107042011300 Avon Water - Good status

The following issues have been identified by the Environment Agency or have been raised by stakeholders:

- Invasive non-native plants
- Possible in-stream obstructions to fish

7.1.4.3 Potential Local Stakeholder Liaison

Local Councils – Milford-on-sea parish / Lymington & Pennington Town / Bransgore parish / Hordle Parish /Sway Parish /Brockenhurst Parish
District Council – New Forest District Council
Forestry Commission
Hampshire & Isle of Wight Wildlife Trust – New Forest Non-Native Plants Project

7.1.4.4 Activities and Action

The following activities and actions have taken place or are planned to improve the water environment in this catchment.

- Not yet addressed

7.2 Lymington River Group

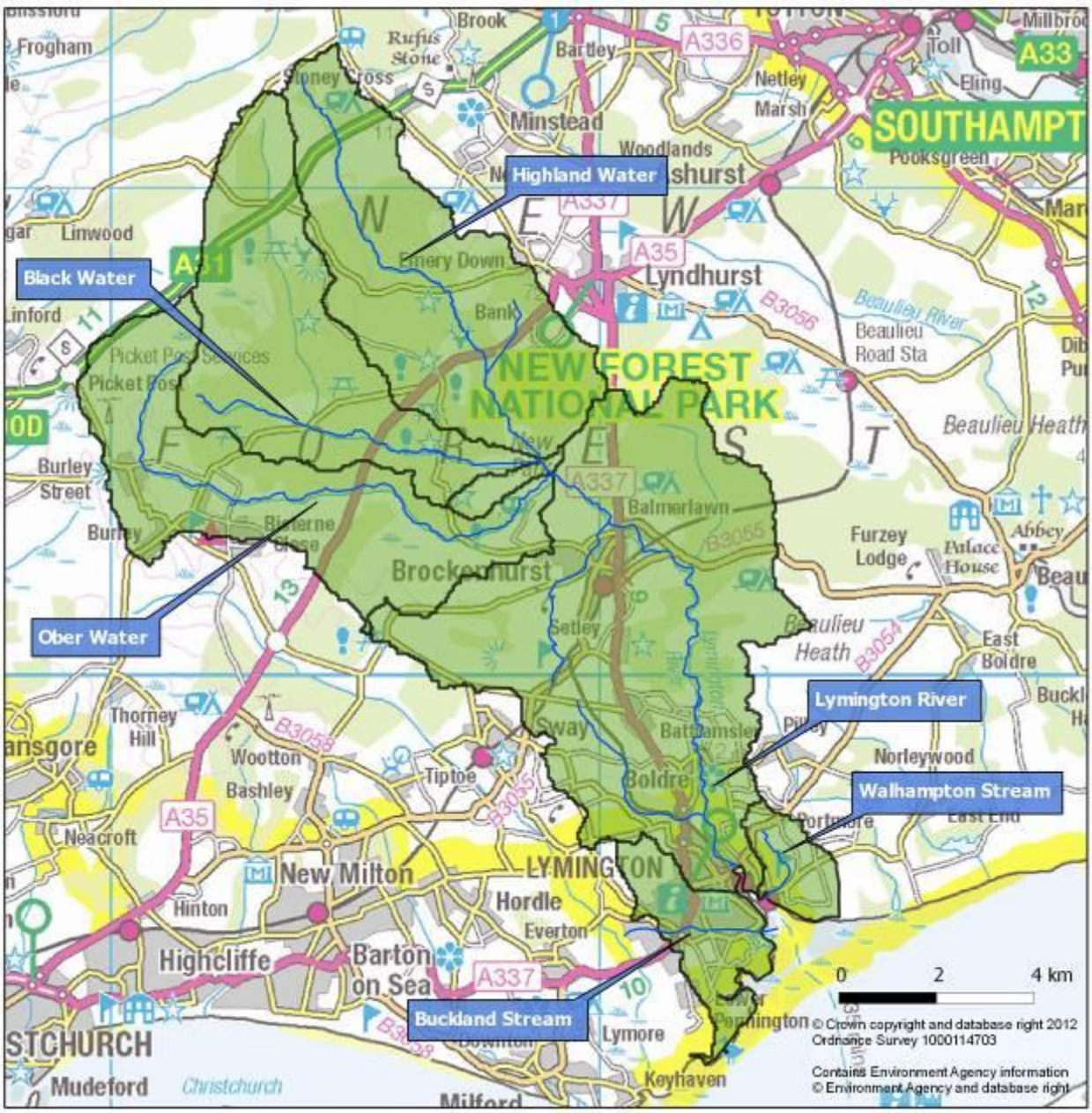


Figure 10 - Lymington River Group map

This group includes the whole of the Lymington River system together with the two small streams flowing into its estuary.

7.2.1 Lymington River System

7.2.1.1 Description

The headwaters of the Lymington River rise in the mires of Stoneycross and Picket Plain areas of the New Forest. They are divided into three main tributaries - the Highland Water, Black Water and Ober Water each of which are fed through many small Forest streams. They join into one main river just north of the village of Brockenhurst. Nearly threequarters of the catchment is Crown land managed by the Forestry Commission which is roughly equally divided between heathland/mires and inclosures/ancient woodland. Although the three tributaries have been significantly straightened and deepened over the last 150 years for drainage purposes, their nutrient poor water there are sections that contain abundant pool, meander and riffle features important to the unique and special character of the New Forest natural environment. A number of sections are at various stages of restoration following infilling of channels, re-instatement of meanders and re-connection with floodplains. The Highland Water receives discharge from the Bank wastewater treatment works.

Below Brockenhurst the course of the river flows through many small settlements and a mixture of agricultural land and ancient woodland including the Roydon Wood nature reserve. Along its way it picks up discharges from the Brockenhurst and Boldre wastewater treatment works. Between Brockenhurst and Lymington it is one of the only New Forest rivers or streams with any significant angling.

On reaching Lymington it borders the town flowing through the Lymington Reed beds nature reserve and crosses under a road and rail causeway through sluice gates into Lymington harbour. The mudflats and saltmarsh of the estuary are important to wildlife and it is designated as a nature reserve. This has to be balanced with the commercial and recreational importance of the harbour as a busy Isle of Wight ferry terminal and a thriving yachting marina.

7.2.1.2 Initial Identification of Issues

The South East River Basin Management Plan (2009) waterbodies covering this area are:

a)	GB107042016720	Highland Water	-	Good status
b)	GB107042016710	Black Water (Upper)	-	Good status
c)	GB107042011320	Black Water (Lower)	-	Good status
d)	GB107042011360	Ober Water	-	Moderate status
e)	GB107042011220	Lymington River	-	Moderate potential
f)	GB520704202100	Lymington (Estuary)	-	Moderate potential

Although the Ober Water was classified as failing it is now highly likely to be passing. This will mean that all the arms of the River Lymington above Brockenhurst will be considered healthy from the Water Framework Directive perspective.

Below Brockenhurst the main river is classified as failing and the following issues have been identified by the Environment Agency or have been raised by stakeholders:

- Low oxygen levels at times throughout the course indicating that the water environment is not completely healthy
- Issue of nitrates in river is likely to be from small equestrian stables with pollutants washing into river from misplaced dung heaps. View that this is more of an issue than farming practices.
- Concerns that wastewater treatment works storm flows could potentially cause problems in the future
- Invasive Non-Native plants
- Experiment of regulated tidal gate opening to improve inter-tidal habitats by allowing salt water to intrude into previously protected freshwater area has supporters and objectors
- Physical modifications in estuary for harbour and flood defence purposes could be mitigated

7.2.1.3 Potential Local Stakeholder Liaison

Local Councils – Boldre parish, Sway parish, Brockenhurst parish, Burley parish, Minstead parish, Lyndhurst parish, Denny Lodge parish, Lymington & Pennington parish
District Council - New Forest District Council
Verderers
Forestry Commission
Commoners Defence Association
Equine Forum
Hampshire & IOW Wildlife Trust
Natural England
Solent Oyster Group Initiative
Lymington Harbour Master
Brockenhurst Fly Fishing Association
Southern Water
Bournemouth & West Hampshire Water
Farm estate owners

7.2.1.4 Activities and Action

The following activities and actions have taken place or are planned to improve the water environment in this catchment.

- Not yet addressed

7.2.2 Buckland Stream

7.2.2.1 Description

The Buckland Stream rises in the area of Priestlands School at Pennington where there several on-line ponds. It then flows its highly modified and culverted course bordering the roads of the southern urban side of Lymington entering the estuary behind the Yacht Haven.

7.2.2.2 Initial Identification of Issues

The South East River Basin Management Plan (2009) waterbody covering this area is

a) GB107042011150 Buckland Stream - Moderate potential

The following issues have been identified by the Environment Agency or have been raised by stakeholders:

- Possible water quality issues due to urban run-off and sedimentation
- Urban physical modifications to watercourse

7.2.2.3 Potential Local Stakeholder Liaison

Local Councils – Lymington & Pennington parish
District Council – New Forest District Council
HCC Highways
Resident Associations

7.2.2.4 Activities and Action

The following activities and actions have taken place or are planned to improve the water environment in this catchment.

- Not yet addressed

7.2.3 Walhampton Stream

7.2.3.1 Description

The Walhampton Stream rises in several small lakes and ponds in the grounds of a large independent school which has a private discharge into the stream. It then travels its largely modified course through private woodland and bordering roads and entering the estuary behind the ferry terminal.

7.2.3.2 Initial Identification of Issues

The South East River Basin Management Plan (2009) waterbody covering this area is

a) GB107042011160 Walhampton Stream - Moderate status

The following issues have been identified by the Environment Agency or have been raised by stakeholders:

- Water quality issues possibly from private treatment works
- Sedimentation
- Invasive non-native plants

7.2.3.3 Potential Local Stakeholder Liaison

Local Councils – Boldre parish
District Council – New Forest District Council
Hordle Walhampton school
Hampshire & IOW Wildlife Trust – Non-native plants project
Local landowners

7.2.3.4 Activities and Action

The following activities and actions have taken place or are planned to improve the water environment in this catchment.

- Not yet addressed

7.3 Beaulieu Heath Group

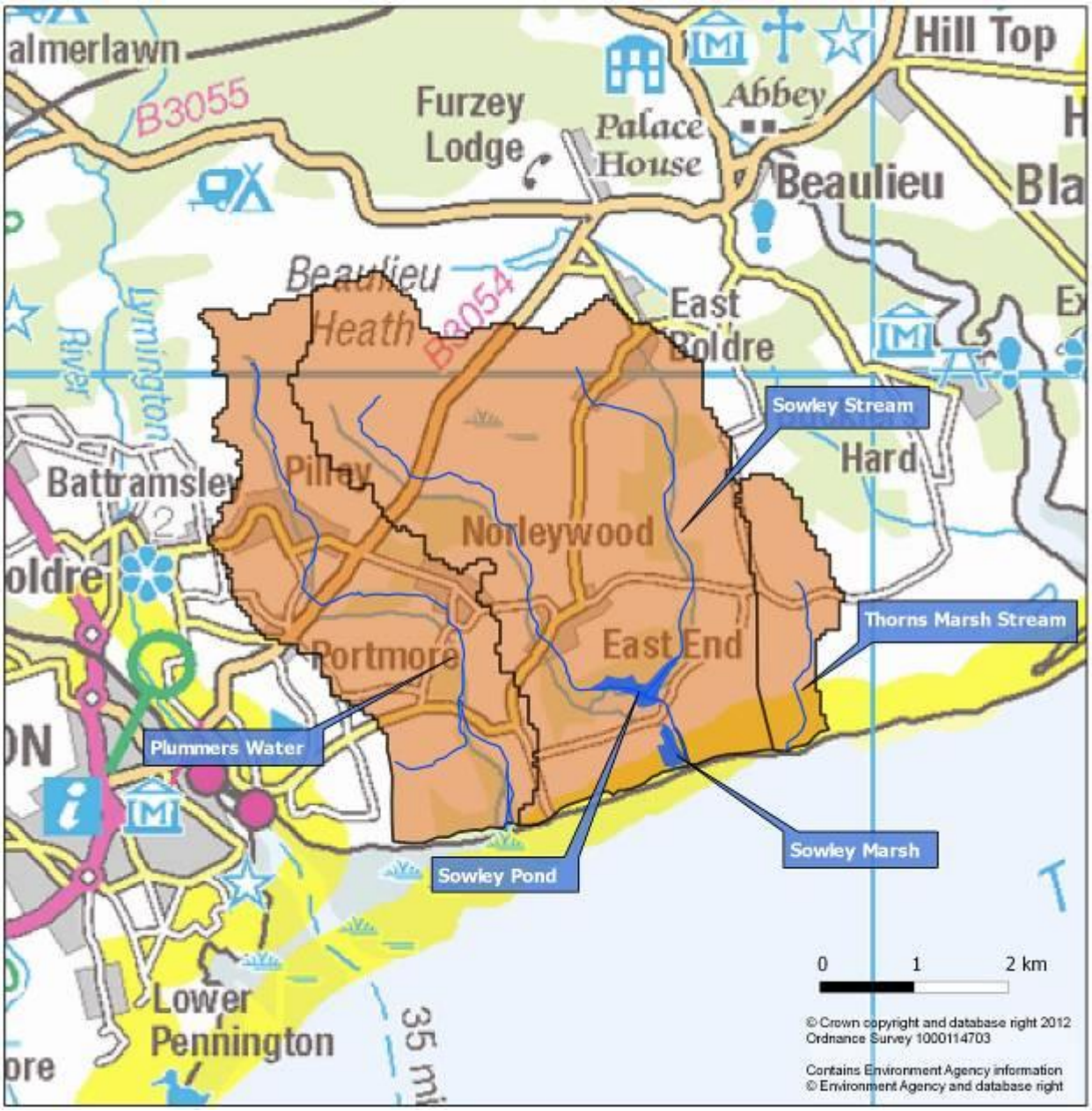


Figure 11 - Beaulieu Heath Group map

All of these waterbodies lie between the Beaulieu and Lymington River estuaries with the streams rising on Beaulieu Heath and flowing south into the Solent.

7.3.1 Sowley Stream, Pond and Marsh

7.3.1.1 Description

There are two arms to the Sowley stream both of which flow into Sowley Pond.

The western arm is known as the Crockford Stream. Its headwaters rise in mires across Beaulieu Heath and then flow across a small area of farmland and then through the hamlet of East End before entering Sowley Pond. A waste water treatment works discharges into the stream at East End. This stream follows a relatively natural course.

The eastern arm is known as the Beck Farm stream. This rises on the edge of the heath at East Boldre. It flows through woods used for shooting game and is bordered all around by agricultural land. There are a number of ponds adjacent to the stream and it flows through an on-line reservoir and shortly afterwards into Sowley Pond

The pond itself was created in the 14th century and later used to feed an ironworks. It is currently used for irrigating potatoes on a nearby farm and is also used for coarse fishing. It is important for surface feeding and diving ducks and contains a large heronry. It is a Site of Special Scientific Interest. The outlet of the pond is through a sluice from where it borders Sowley Marsh/lagoon before entering the sea.
Sowley Marsh/lagoon is an area of low lying marshland which has built up behind a developing shingle bank. At times the bank closes off completely and a lagoon develops with varying degrees of salinity. Currently this is the case with the sea having recently broken through the shingle bank on its western side with as yet little effect.

7.3.1.2 Initial Identification of Issues

The South East River Basin Management Plan (2009) waterbodies covering this area are

a) GB107042011190 Sowley Stream - Moderate potential
b) GB30745790 Sowley Pond - Poor potential
c) GB610070075000 Sowley Marsh - Moderate status

The following issues have been identified by the Environment Agency or have been raised by stakeholders:
Sowley Stream:

- Water quality issues possibly due to diffuse pollution from agricultural land and the waste water treatment works at East End
- Physical changes to the watercourse and obstructions

Sowley Pond:

- Water quality issues possibly due to diffuse pollution accumulating from the two feeder streams which cross agricultural land and from the waste water treatment works at East End

Sowley Marsh:

- It has been classified as Moderate status by default as insufficient data was available at the time. It is actually believed to be in a good condition.

7.3.1.3 Potential Local Stakeholder Liaison

Local Councils – Beaulieu parish / East Boldre parish / Boldre parish
District Council – New Forest District Council
Southern Water Services
Sowley & Norman Court Estate
Landowners
Small local farmers
Verderers
Forestry Commission
Commoners Defence Association
Lymington Nature Reserves Site Manager
Natural England
Solent Forum

7.3.1.4 Activities and Action

The following activities and actions have taken place or are planned to improve the water environment in this catchment.

Overview

The Sowley Stream is a straightened stream in forestry plantation, open reaches managed for game, temporary woodland pond and Sowley Pond as shown in Figure 12.

Figure 12 - Sowley stream river reach illustrations

Desk-top familiarisation

- Analysis of monitoring data above the sewage treatment works shows that the Crockford Stream is achieving high standards for invertebrates and fish and is passing the minimum standards for phys-chem. The only parameters currently failing under the Water Framework Directive are measures for copper and diatoms, but this may be due to sampling location. Trends show a reduction in the levels of polluting nutrients (nitrates and phosphates) over time. This arm of the Sowley Stream has been monitored from 1979-2012.
- The Beck Farm branch showed similar trends, but monitoring ceased in 2004. A monk on Newlands Pond in the Sowley Estate may present a barrier to fish passage upstream.
- Sowley Pond is the only WFD waterbody in the New Forest to be classified as Poor – due to elevated levels for Total Phosphorus. The pond also has elevated levels for Total Nitrogen, a parameter which is not assessed under the Water Framework Directive. High levels of nutrients have resulted in additional failures for midge larvae, diatoms and phytoplankton – groups which are sensitive to nutrient pollution.
- Sluices at the exit to the pond and lower downstream have also been identified as potential barriers to fish migration.

Provisional catchment walkovers

- Identification of potential problems and initial water sampling using conductivity as a guide to identify water quality issues. The provisional catchment walkover was limited as it only included land which could be accessed from the road.

Technical summary produced

- Technical summary (Similar to that in Appendix A) and issues map (Figure 13) were produced as a communication tool with which to liaise with landowners and other

interested parties.

Liaison with local communities and other interested parties

- Meetings held with key stakeholders to discuss issues identified in preliminary catchment walkovers and to gain agreement for more detailed investigation.

Follow-up catchment walkovers

- Detailed walkover of the Sowley Catchment to identify specific water quality (phosphate and nitrate), structural and morphological problems and identify potential remedial actions.
- Results for water quality confirm that there are very low levels of phosphates and nitrates in headwater streams and pond habitats in the New Forest SAC. Outside of the protected area even small amounts of development were sufficient to raise the levels about minimum standards set by the Water Framework Directive. Spikes in phosphate levels could be matched to specific drains and ditches and were sporadic. Nitrate levels were significantly elevated throughout agricultural areas.
- Results from the Beck Farm branch suggested that fields in this part of the catchment may be a contributing to the downstream failures of Sowley Pond in addition to the issues at the Sewage Treatment Works where sewage fungus was observed growing in the stream.
- Interestingly ponds in the downstream reaches of the Sowley Stream that were not connected to the stream retained good water quality, providing a habitat for freshwater wildlife.
- It is important to note that in many instances the diffuse runoff from individual fields is small, but we are interested in looking at the cumulative effect on river biota. In the Sowley catchment which has less than 30% agriculture it should be possible to reduce levels of nutrients and sediments below damaging levels.

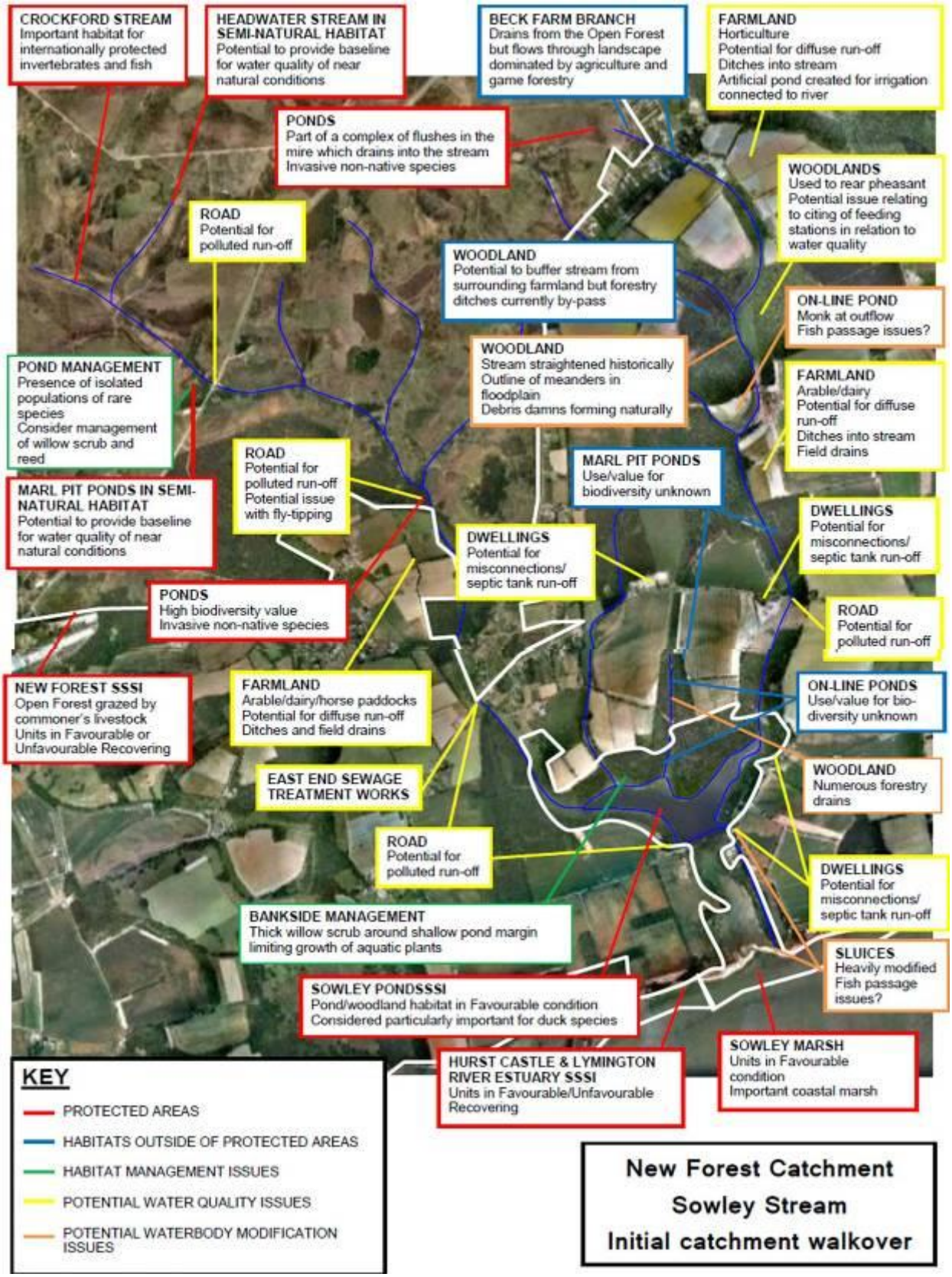


Figure 13 - Sowley initial catchment walkover issues

Relevant initiatives

- We have worked with the Environment Agency WFD Stage 3 working group to ensure a co-ordinated approach to taking action in the Sowley Stream Catchment.
- The Environment Agency is working with Southern Water to determine whether action is needed to address discharge issues from East End Sewage Treatment Works.
- We are working with the New Forest Land Advice Service and Natural England to seek opportunities where changes can be implemented as part of Environmental Stewardship Schemes.
- The New Forest Non-native Plants Project is aware of the presence of *Crassula helmsii* in ponds at East End.

Catchment actions for the Sowley Stream

Monitoring and identification of other stakeholder priorities

- Ensure that recognition is given to pristine habitats within the Sowley Catchment and ensure that the quality of these habitats is not lost in the overall rating for the catchment.
- Undertake a review of Sowley Pond to determine the status of the habitat for Species of Conservation Concern. Work with the Environment Agency, Natural England and the landowner to identify priorities for the habitat and agree a sustainable management plan for the site.
- Engage with the local authority and local communities, to determine additional local stakeholder priorities.

Water quality

- Disseminate findings of the detailed catchment walkover to the landowner and discuss options and measures which could reduce runoff and increase the diversity of in-stream and floodplain habitats.
- Pass information about potential sources of diffuse pollution from septic tanks and point source pollution incidents to the Environment Agency and resolve where necessary.

Mitigation measures

- The Environment Agency has assessed structures identified during catchment walkovers to determine whether they should be modified to allow fish passage.

Habitat management

- Liaise with the Forestry Commission to ensure that pond habitat is managed to benefit isolated populations of rare species – develop through the New Forest Pondscape Strategy.

Wider catchment action delivery

Many freshwater habitats in the Sowley Stream catchment have the potential to achieve the highest standards for water quality. It would be interesting to exchange experiences with other catchments that have had potential issues with classifying streams according to the lowest failing element, especially in complex catchments which have both pristine and degraded tributaries.

7.3.2 Thorns Marsh Stream

7.3.2.1 Description

This is a short stream that rises in the Newlands area between the Becks Farm stream and the Hatchet stream. It flows through agricultural land where it has been straightened for most of its length. In its lowest reaches it enters an area of woodland with several on-line ponds followed by an area of marshland with drainage ditches.

7.3.2.2 Initial Identification of Issues

The South East River Basin Management Plan (2009) waterbody covering this area is

a) GB107042011180 Thorns Marsh Stream - Moderate status

The following issues have been identified by the Environment Agency or have been raised by stakeholders:

- Possible water quality issues due to agricultural diffuse pollution

7.3.2.3 Potential Local Stakeholder Liaison

Local Councils – Beaulieu parish
District Council – New Forest District Council
Estate landowners
Local tenant farmers

7.3.2.4 Activities and Action

The following activities and actions have taken place or are planned to improve the water environment in this catchment.

- Not yet addressed

7.3.3 Plummers Water

7.3.3.1 Description

This stream rises in mires on the western edge of Beaulieu Heath near Pilley. It flows through a wholesale nursery near several ponds and continues through woods at Norley Wood inclosure and South Baddesley. It then enters the Pylewell Estate where it flows through several on-line ponds with adjacent lakes and continues to the sea through the mudflats of a nature reserve.

7.3.3.2 Initial Identification of Issues

The South East River Basin Management Plan (2009) waterbody covering this area is

a) GB107042011280 Plummers Water - Good status

The following issues have been identified by the Environment Agency or have been raised by stakeholders:

- None yet identified

7.3.3.3 Potential Local Stakeholder Liaison

Local Councils – Boldre parish
District Council – New Forest District Council
Verderers
Forestry Commission
Commoners Defence Association
Wholesale nursery
Estate landowners
Local tenant farmers

7.3.3.4 Activities and Action

The following activities and actions have taken place or are planned to improve the water environment in this catchment.

- Not yet addressed

7.4 Beaulieu River Group

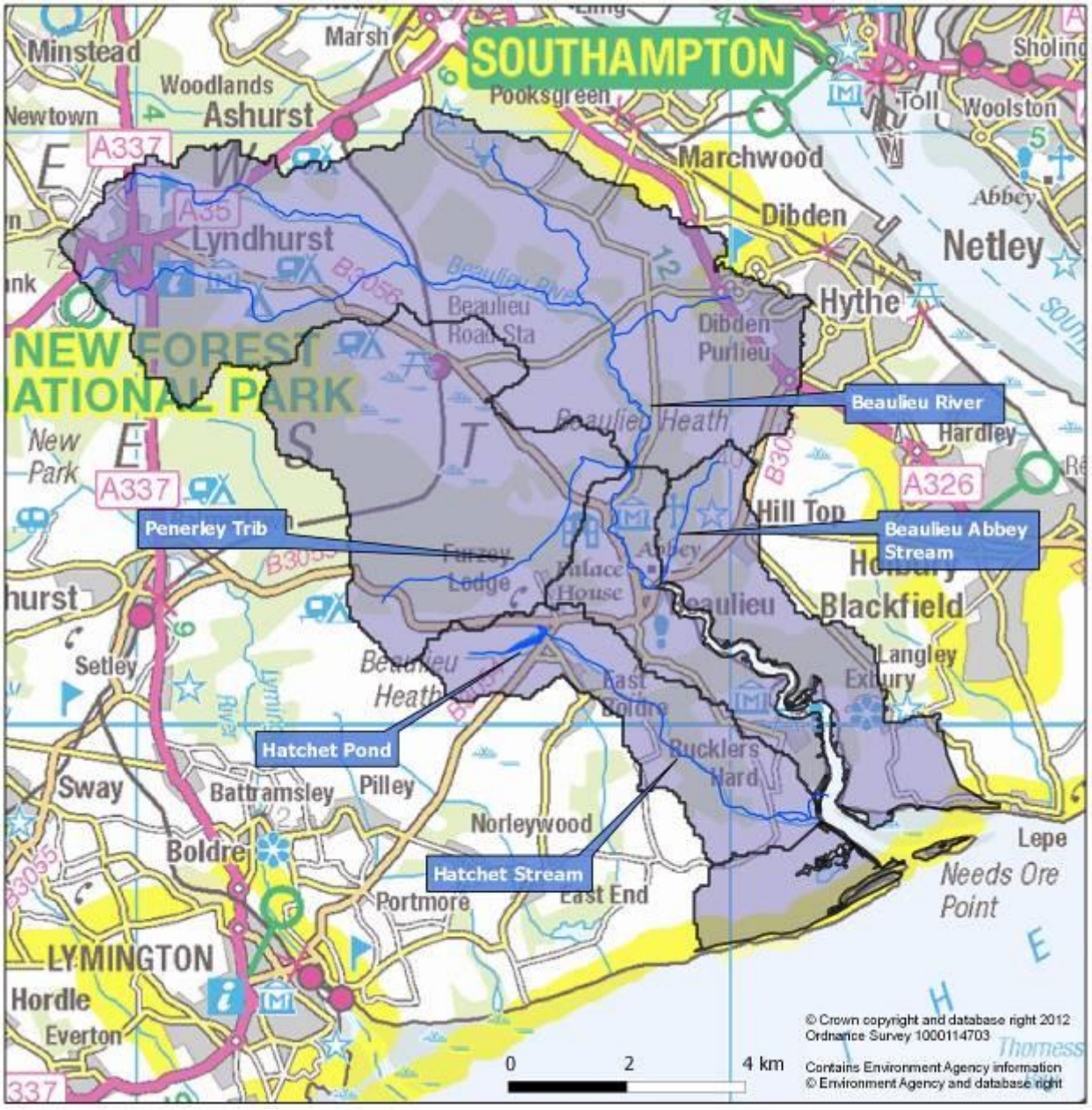


Figure 14 - Beaulieu River Group map

This group includes the whole of the Beaulieu River system together with its estuary and an adjacent lagoon. It also covers the Hatchet Pond and Hatchet Stream which joins the estuary on its western side.

7.4.1 Beaulieu River System

7.4.1.1 Description

The official source of the main Beaulieu River is at Pikes Hill in Lyndhurst. From here this truly Forest river skirts mixed woodland inclosures, picking up storm discharges from the Lyndhurst waste water treatment works. It then traverses a large area of bog and heathland draining many small Forest streams which originate in the surrounding inclosures. At Ipley it is joined from the north by a tributary which has flowed through small fielded farmland and continues along a narrow wooded course across Beaulieu Heath bordered along the way by mires and several ponds. At the North Gate of Beaulieu Estate the main river is joined from the west by Penerley Water which combined with the Shepton Water likewise flows its course through inclosures and heath. In its latter stages it is bordered by soft fruit growing farmland.

At Hartford Bridge it becomes tidal and follows the B3056 road past Beaulieu Motor Museum and flows into the reed fringed Mill Pond adjacent to Beaulieu Abbey which discharges through sluice gates into the Beaulieu Estuary. At this point is met by the short Beaulieu Abbey stream which rises in woodland at Hartford House and flows along a modified course which includes a number of on-line ponds.
The Beaulieu estuary itself is a relatively natural meandering creek and is bordered in many places by woodland and has significant areas of mudflat and saltmarsh. It is used by small boats and has many private landing stages. It enters the Solent through a nature reserve at Needs Ore Point which hosts many wildfowl and waders adjacent to which is the Black Water lagoon area of reed beds, which is controlled by sluice gates onto the estuary.

7.4.1.2 Initial Identification of Issues

The South East River Basin Management Plan (2009) waterbody covering this area is

a)	GB107042016340	River Beaulieu (Upper)	-	Moderate status
b)	GB107042011230	Penerley Trib	-	Good status
c)	GB107042011200	River Beaulieu (Lower)	-	Moderate potential
d)	GB520704201400	Beaulieu River (Estuary)	-	Moderate potential
e)	GB107042011210	Beaulieu Abbey Stream	-	Moderate status
f)	GB5607042017200	Black Water Lagoon	-	Moderate status

The following issues have been identified by the Environment Agency or have been raised by stakeholders:

- Possible issues with management of sluice gates at Millpond
- Concern over low oxygen levels at times which is thought to be due to natural causes

7.4.1.3 Potential Local Stakeholder Liaison

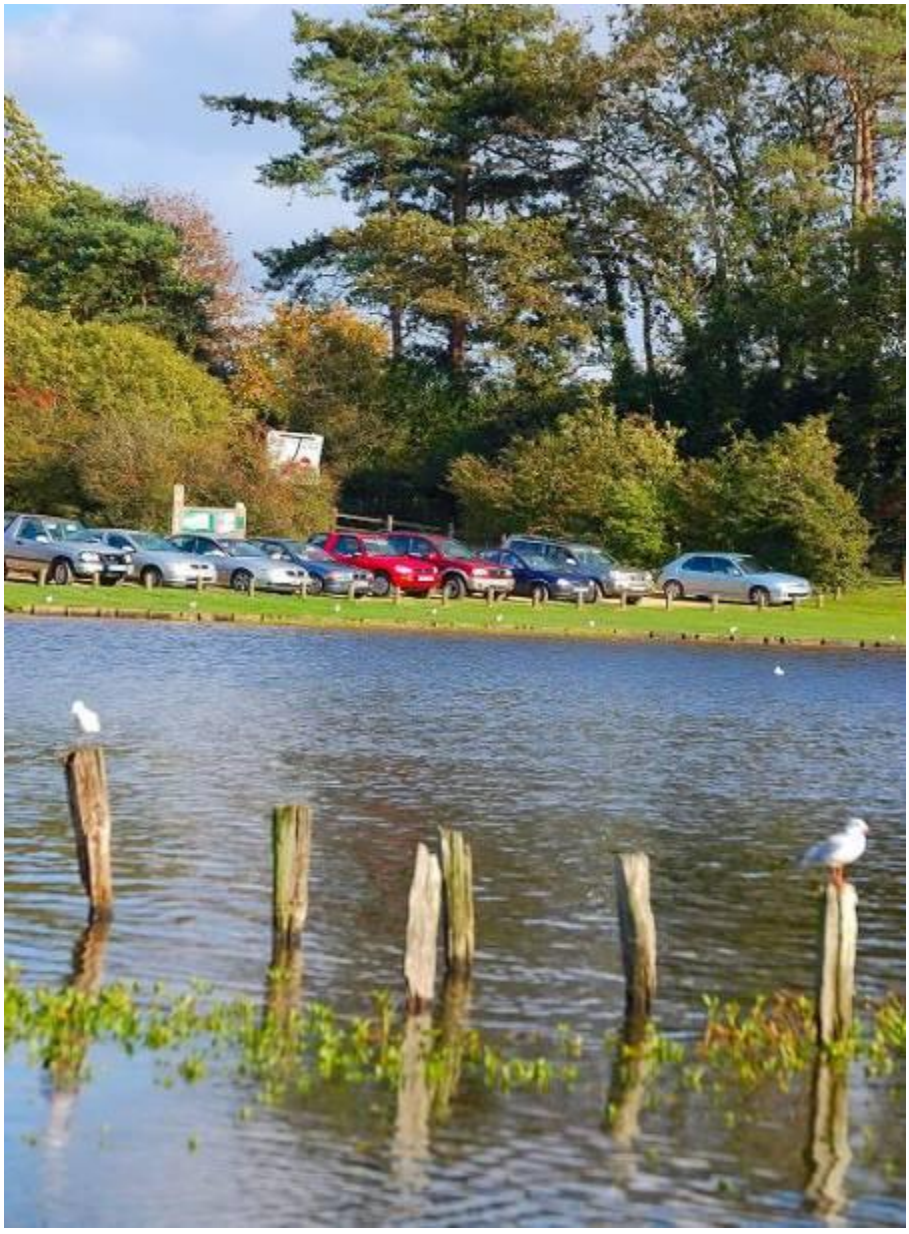
Local Councils – Beaulieu parish/Denny Lodge parish/Exbury & Lepe parish/Lyndhurst parish
District Council – New Forest District Council
Beaulieu Estate
Soft fruit growers
Verderers
Forestry Commission
Commoners Defence Association
Solent Oyster Group Initiative
Solent Forum
Natural England

7.4.1.4 Activities and Action

The following activities and actions have taken place or are planned to improve the water environment in this catchment.

- Not yet addressed

7.4.2 Hatchet Stream and Pond



7.4.2.1 Description

The Hatchet Stream rises in mires on Beaulieu Heath and flows through Hatchet Pond which is the only Special Area of Conservation (SAC) pond in the New Forest. It was originally created to power an ironworks in the 18th century but is now a popular tourist spot and is the only pond in the Forest where angling is permitted.

Hatchet stream flows out of the pond through a pipe under the road and continues through arable farmland and mixed woodland. In a number of places its course has been altered to drain the agricultural land and is joined by a number of field ditches. Before joining the lower part of the Beaulieu estuary through a tidal sluice, it passes through several ponds and areas of saltmarsh and coastal grazing marsh of the national nature reserve.

7.4.2.2 Initial Identification of Issues

The South East River Basin Management Plan (2009) waterbody covering this area is

a)	GB107042011400	Hatchet Stream	-	Moderate potential
b)	GB30745652	Hatchet Pond	-	Moderate potential

The following issues have been identified by the Environment Agency or have been raised by stakeholders:

- Water quality issues possibly due to diffuse pollution from agricultural land and the waste water treatment works at East Boldre
- Possible pollution from private house discharges
- Physical changes to the watercourse and obstructions
- Non-native plants in pond
- Stonewort rare plants in pond possibly suffering from phosphate levels as very sensitive. Possibly due to bait or duck feeding
- Pipe from pond into stream is causing fish/eel obstruction

7.4.2.3 Potential Local Stakeholder Liaison

Local Councils – Beaulieu parish/East Boldre parish
District Council – New Forest District Council
Beaulieu Estate
Verderers
Forestry Commission
Commoners Defence Association
Individual residences
HCC Lymington Nature Reserves Officer
Natural England
Hampshire & IOW Wildlife Trust – Non-native plant project

7.4.2.4 Activities and Action

The following activities and actions have taken place or are planned to improve the water environment in this catchment.

Overview
The Hatchet Stream catchment includes Hatchet Pond SAC, open and shaded river reaches and a shaded marl pit outside of the New Forest SAC. As shown in Figure 15.

Figure 15 - Hatchet Pond and Stream reach illustrations

Desk-top familiarisation

- Analysis of monitoring data collected by the Environment Agency show that although Hatchet Pond achieved physico-chemical standards for Good status in 2006, values for phosphates have varied since 2003 – considered to be below the minimum standards required under WFD in 2004, and higher than 2006 level since that time. Midge larvae which are sensitive to pollution were classified as Moderate. The perceived declines in Species of Conservation Concern supported by the pond require further investigation.
- Environment Agency data for the Hatchet Stream show that the stream here is currently achieving the minimum standards for some measures – ammonia, dissolved oxygen, copper and zinc, but is failing for phosphates although levels have been dropping steadily since 1989. Nitrates which are not measured for Water Framework Directive have been increasing over the same time period. Steps could also be taken to improve modified sections of stream and in-stream structures which may pose an obstruction to fish passage.

Provisional catchment walkovers

- Identification of potential problems and initial water sampling using conductivity as a guide to identify water quality issues. The provisional catchment walkover was limited as it only included land which could be accessed from the road.
- Conductivity was very low in streams and ponds in the New Forest SAC (indicating low nutrient levels). Outside of the SAC levels doubled and in some ditches and ponds were 4 times higher than background levels.

Technical summary produced

- Technical summary (similar to that in Appendix A) and issues map (Figure 16) were produced as a communication tool with which to liaise with landowners and other interested parties.

Liaison with local communities and other interested parties

- Meetings held with key stakeholders to discuss issues identified in preliminary catchment walkovers and to gain agreement for more detailed investigation.

Follow-up catchment walkovers

- Detailed walkover of the Hatchet Catchment to identify specific water quality (phosphate and nitrate), structural and morphological problems and identify potential remedial actions.
- Results for water quality reveal low levels of phosphates in headwater streams and pond habitats in the New Forest SAC and only sporadic polluting levels (above the minimum standards agreed by the Water Framework Directive) of phosphates in downstream habitats. The isolated occurrence of episodes increases the possibility that measures could be put in place to reduce their impact on the stream.
- Nitrate levels were more elevated than phosphate levels in the Hatchet Stream and as above, it was possible to identify specific drains and ditches which were contributing elevated nutrient loads to the stream.
- It is important to note that in many instances the diffuse runoff from individual fields is small, but we are interested in looking at the cumulative effect on river biota. In the Hatchet Catchment which has less than 30% agriculture it should be possible to reduce levels of nutrients and sediments below damaging levels.

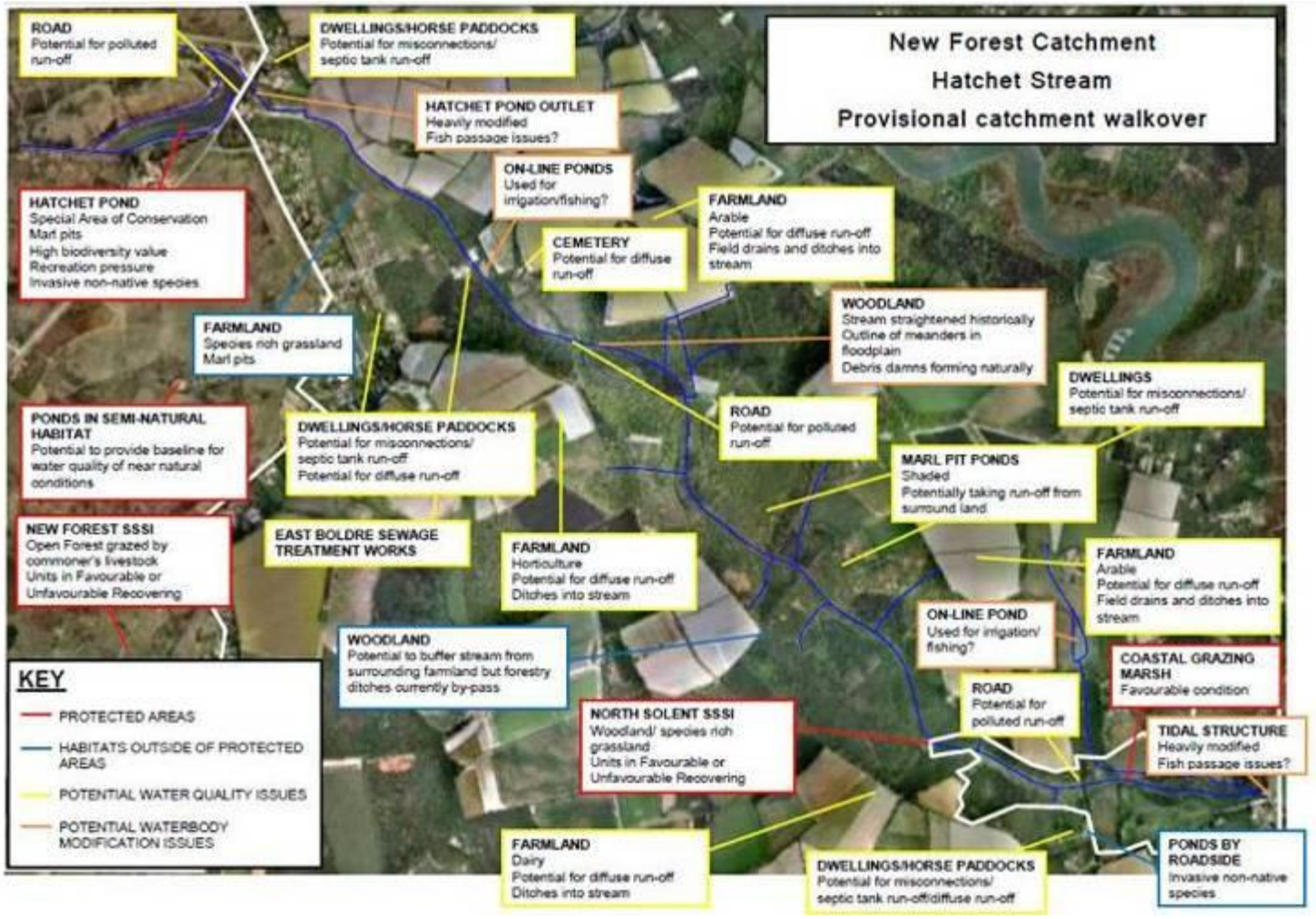


Figure 16 - Hatchet Stream initial catchment walkover issues

Relevant initiatives

- We have worked with the Environment Agency WFD Stage 3 working group to ensure a co-ordinated approach to taking action in the Hatchet Stream Catchment.
- The Environment Agency is working with Southern Water to determine whether action is needed to reduce discharges from East Boldre Sewage Treatment Works.
- We are working with the New Forest Land Advice Service to seek opportunities where changes can be implemented as part of Environmental Stewardship Schemes.
- The New Forest Non-native Plants Project is aware of the presence of *Crassula helmsii* at Hatchet Pond.

Catchment actions for the Hatchet Stream

Monitoring and identification of other stakeholder priorities

- Undertake an investigation of Hatchet Pond to determine the status of the habitat for Species of Conservation Concern. Work with the Environment Agency, Natural England and the Forestry Commission to identify the priorities for the habitat and agree a sustainable management plan for the site.
- Engage with the local authority and local community, to determine additional local stakeholder priorities.

Water quality

- Disseminate findings of the detailed catchment walkover to the landowner and discuss options and measures which could reduce runoff and increase the diversity of in-stream and floodplain habitats.
- Pass information about potential sources of diffuse pollution from septic tanks to the Environment Agency and resolve where necessary.

Mitigation measures

- The Environment Agency has assessed structures identified during catchment walkovers to determine whether they should be modified to allow fish passage.

Wider catchment action delivery

Many freshwater habitats in the Hatchet Stream catchment have the potential to achieve the highest standards for water quality. If we can achieve this in the catchment through collaborative working between stakeholders it will be a case-study of interest to other catchments, who may wish to learn from our experiences.

7.5 Lepe Group

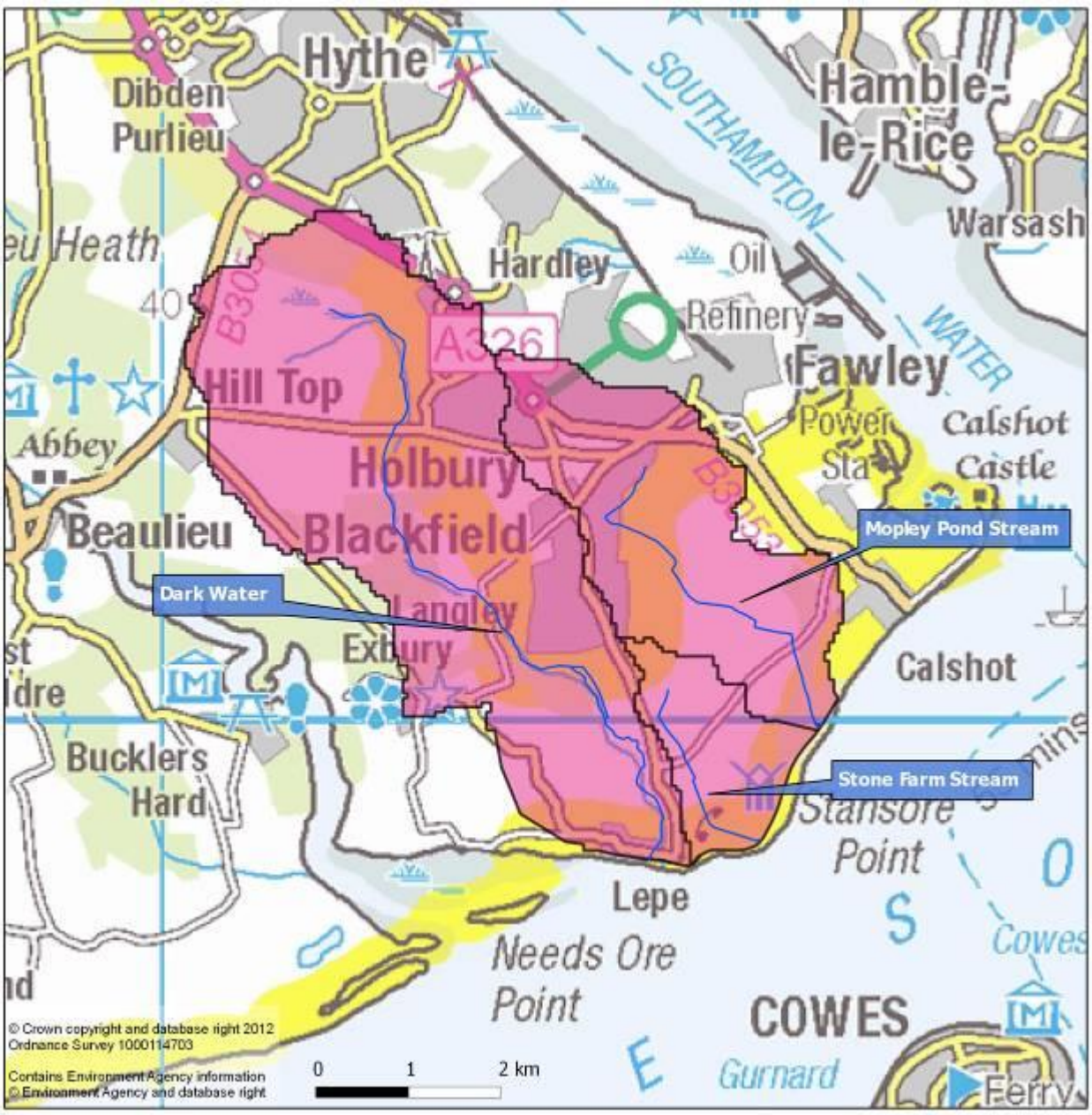


Figure 17 - Lepe Group map

This group of streams all flow south into the Solent in the area of land between the Beaulieu River estuary and Calshot Spit. They are all at the edge of the Forest and are squeezed between encroaching urban area and farmland with their entry into the sea controlled.

7.5.1 Dark Water

7.5.1.1 Description

The upstream headwaters of the Dark Water comprise a number of small tributaries all rising in the mires on the very eastern edge of Beaulieu Heath. They flow across heathland and then through areas of woodland skirting the Forest boundary and adjacent to the urban areas of Dibden Purlieu, Hardley and Holbury. There are a number of ponded and wetland areas of this course. On reaching Langley there are several on-line ponds and reservoirs at Sturt Bridge and the stream continues through woodland before coming a wetland area sandwiched between farmland at Lepe. The river is flanked here by reed beds and marsh vegetation and joins the sea via a tunnel and tidal gates.

7.5.1.2 Initial Identification of Issues

The South East River Basin Management Plan (2009) waterbody covering this area is

a) GB107042011330 Dark Water - Good potential

The following issues have been identified by the Environment Agency or have been raised by stakeholders:

- Potential for urban diffuse pollution such as road runoff

7.5.1.3 Potential Local Stakeholder Liaison

Local Councils – Exbury & Lepe parish/Denny Lodge parish/Fawley parish
District Council – New Forest District Council
Verderers
Forestry Commission
Commoners Defence Association
Residence association
Tenant farmers
HCC Highways

7.5.1.4 Activities and Action

The following activities and actions have taken place or are planned to improve the water environment in this catchment.

- Not yet addressed

7.5.2 Stones Farm Stream

7.5.2.1 Description

This very short stream rises in a copse just south of Blackfield near a small reservoir. It has been considerably straightened for drainage purposes and flows entirely through arable farmland before entering a significant wetland area. It flows into the Solent through a tunnel under Lepe Beach.

7.5.2.2 Initial Identification of Issues

The South East River Basin Management Plan (2009) waterbody covering this area is

a) GB107042011290 Stone Farm Stream - Good status

The following issues have been identified by the Environment Agency or have been raised by stakeholders:

- Potential for agricultural diffuse pollution

7.5.2.3 Potential Local Stakeholder Liaison

Local Councils – Fawley parish
District Council – New Forest District Council
Estate landowner

7.5.2.4 Activities and Action

The following activities and actions have taken place or are planned to improve the water environment in this catchment.

- Not yet addressed

7.5.3 Mopley Pond Stream

7.5.3.1 Description

This stream rises on the edge of the Blackfield urban area where there is a small on-line commercial fishing lake. It continues through a remnant area of heathland and a corridor of woodland to Mopley Pond itself which is also a commercial fishing lake. It then flows through woodland bordered by arable farm fields and enters an extremely straightened reach and small wetland area before entering the sea under Lepe Beach.

7.5.3.2 Initial Identification of Issues

The South East River Basin Management Plan (2009) waterbody covering this area is

a) GB107042011310 Mopley Pond Stream - Good status

The following issues have been identified by the Environment Agency or have been raised by stakeholders:

- Potential for urban diffuse pollution such as road runoff

7.5.3.3 Potential Local Stakeholder Liaison

Local Councils – Fawley parish
District Council – New Forest District Council
Commercial Fishery
Residents groups
Estate landowner

7.5.3.4 Activities and Action

The following activities and actions have taken place or are planned to improve the water environment in this catchment.

- Not yet addressed

7.6 Waterside Group

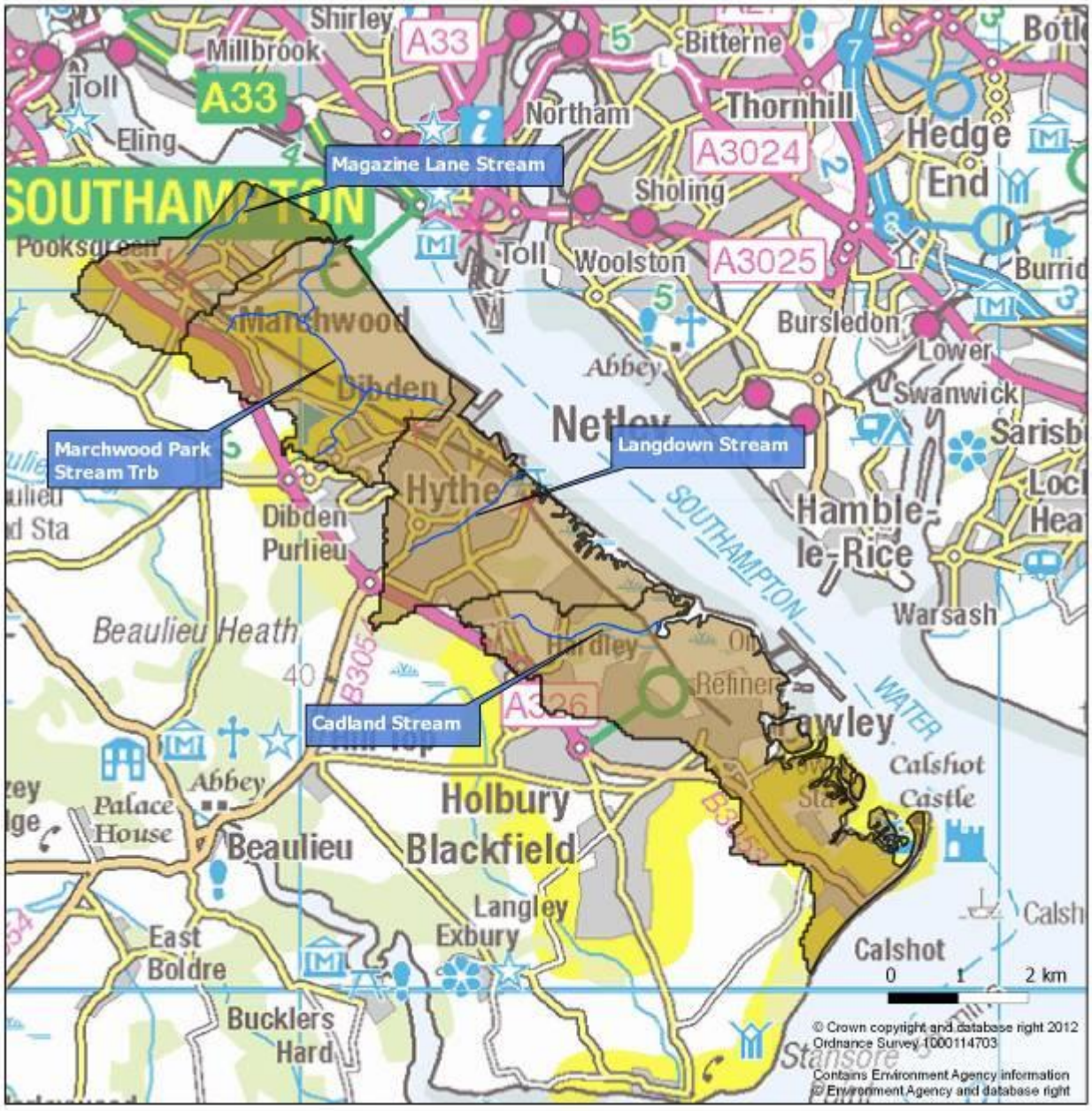


Figure 18 - Waterside Group map

This group all flow east into Southampton Water in the highly urban residential and industrial area known as the Waterside.

7.6.1 Magazine Lane Stream

7.6.1.1 Description

This short stream has its source in an area of woodland just west of the Marchwood bypass. Flowing under that road it immediately enters a new residential estate on the edge of Marchwood. It flows through the estate acting as drain to the roads and is heavily constrained for flood defence purposes. In some parts it has been landscaped and in other forms a narrow corridor heavily shaded by trees and bordered by public footpaths. After crossing main road it edges road to the public hard and is bordered by an industrial estate. Just prior to the hard it opens out into a long straight section to aid small boat navigation before joining Southampton Water.

7.6.1.2 Initial Identification of Issues

The South East River Basin Management Plan (2009) waterbody covering this area is

a) GB107042016700 Magazine Lane Stream - Moderate potential

The following issues have been identified by the Environment Agency or have been raised by stakeholders:

- Possible water quality issues due to pipe misconnections in residences and road run-off
- Urban physical modifications to watercourse
- Erosion of bank next to road in tidal section downstream of main road

7.6.1.3 Potential Local Stakeholder Liaison

Local Councils – Marchwood parish
District Council – New Forest District Council
HCC Highways
Residents associations
Southern Water

7.6.1.4 Activities and Action

The following activities and actions have taken place or are planned to improve the water environment in this catchment.

- Not yet addressed

7.6.2 Marchwood Park Stream

7.6.2.1 Description

This heavily modified stream rises at a lake near Marchwood Priory and flows under the Marchwood bypass and through a small are of woodland before entering an area of drained grassland. The stream has obviously been significantly altered to facilitate the drainage and follows an unnatural course via a very thinly wooded corridor through this open area of grassland. It then borders the Marchwood Military port before entering Southampton Water.

7.6.2.2 Initial Identification of Issues

The South East River Basin Management Plan (2009) waterbody covering this area is

a) GB107042016690 Marchwood Park Stream - Good potential

The following issues have been identified by the Environment Agency or have been raised by stakeholders:

- No known issues

7.6.2.3 Potential Local Stakeholder Liaison

Local Councils – Marchwood parish/Hythe & Dibden parish
District Council – New Forest District Council
Marchwood military port

7.6.2.4 Activities and Action

The following activities and actions have taken place or are planned to improve the water environment in this catchment.

- Not yet addressed

7.6.3 Langdown Stream

7.6.3.1 Description

This is a short highly urbanised stream which rises in the midst of a housing estate in Dibden Purlieu and flows through it draining a number of estate roads. Nevertheless its latter half provides a woodland corridor which is used for recreation by the occupants of the estate. It flows into Southampton Water at the upper boundary of the Hythe Spartina Marsh nature reserve.

7.6.3.2 Initial Identification of Issues

The South East River Basin Management Plan (2009) waterbody covering this area is

a) GB107042011350 Langdown Stream - Moderate potential

The following issues have been identified by the Environment Agency or have been raised by stakeholders:

- Possible water quality issues due to pipe misconnections in residences and road run-off
- Urban physical modifications to watercourse
- Possible fish obstructions
- Non-native plants

7.6.3.3 Potential Local Stakeholder Liaison

Local Councils – Hythe & Dibden parish
District Council – New Forest District Council
Residents Associations
HCC Highways
Southern Water
Hampshire & IOW Wildlife Trust – Non-native plants project

7.6.3.4 Activities and Action

The following activities and actions have taken place or are planned to improve the water environment in this catchment.

- Not yet addressed

7.6.4 Cadland Stream

7.6.4.1 Description

This short stream lies entirely within the boundary of Fawley refinery. Its source is springs in the Butts Ash area of Hythe and shortly after this it receives discharges from Essoville waste water treatment works. It then crosses under the main refinery access road before flowing through an area of woodland within the industrial site into an on-line reservoir before entering Southampton Water through Cadland Creek.

7.6.4.2 Initial Identification of Issues

The South East River Basin Management Plan (2009) waterbody covering this area is

a) GB107042011340 Cadland Stream - Moderate status

The following issues have been identified by the Environment Agency or have been raised by stakeholders:

- Water quality issues probably from Essoville waste water treatment works
- Possible diffuse pollution from industrial and urban area

7.6.4.3 Initial Local Stakeholder Identification

Local Councils – Fawley parish
District Council - New Forest District Council
Fawley refinery – Esso Mobil Chemical

7.6.4.4 Activities and Action

The following activities and actions have taken place or are planned to improve the water environment in this catchment.

- Not yet addressed

7.7 Bartley Water Group

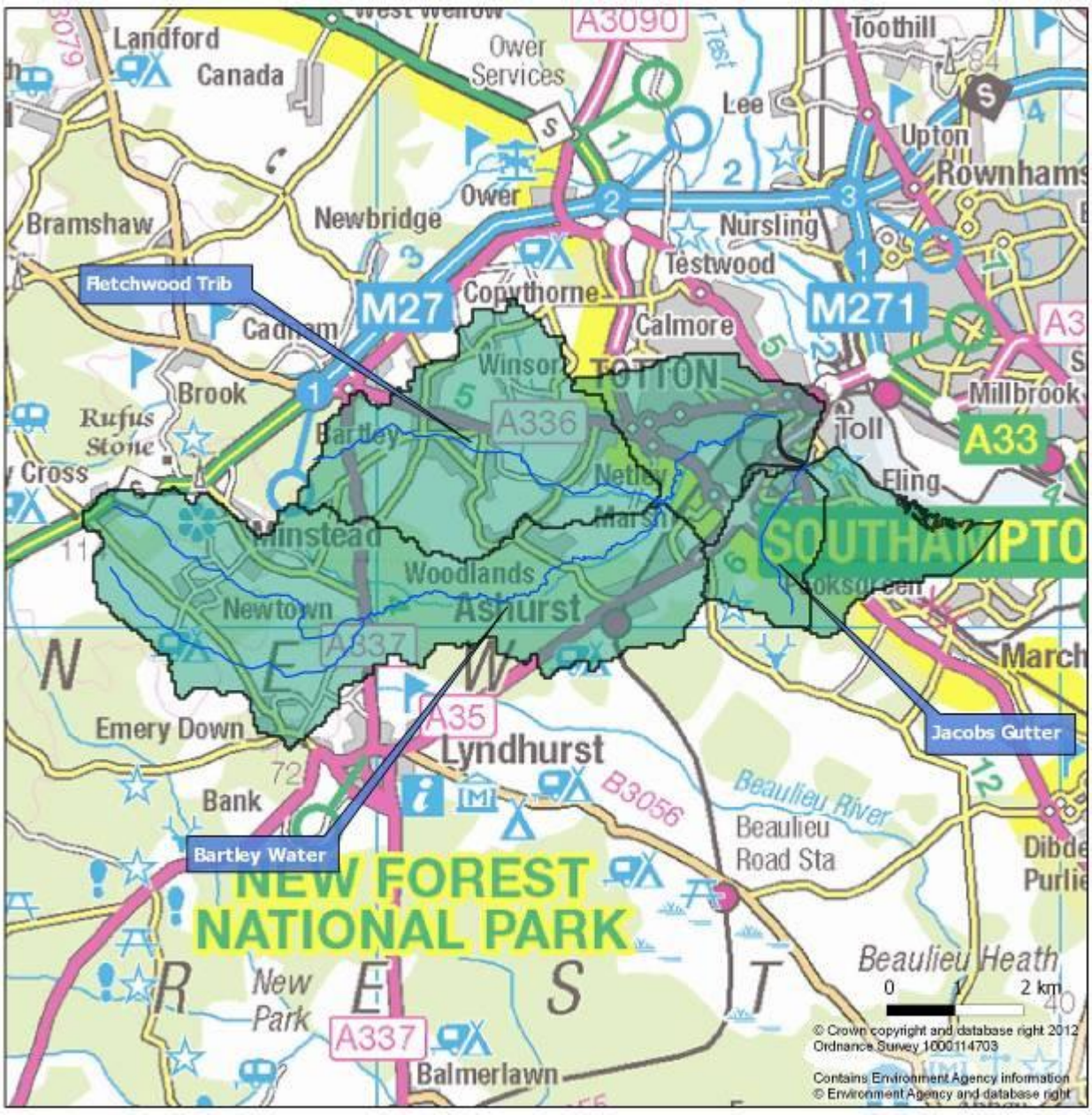


Figure 19 - Bartley Water Group map

These streams form the Bartley Water river system area which flows into the head of Southampton Water at Eling near Totton.

7.7.1 Bartley Water

7.7.1.1 Description

The headwaters of the main Bartley Water rise in the Minstead and Stoneycross area meandering north east of Lyndhurst through the Forest mixed woodland inclosure of Busketts Lawn until reaching Ashurst. Halfway through the inclosure they receive a discharge via a pipeline from the Lyndhurst waste water treatment works. The section through the inclosure has historically been deepened which has led to a lack of connectivity with its floodplain. From Ashurst it continues to meander through open farmland and is met by the Fletchwood tributary. At Ashurst Bridge it enters the built up area of Totton where it becomes modified for flood defence purposes. At Rushington it becomes tidal and continues as a wider modified channel opening out into a local nature reserve behind the causeway at Eling tide mill it is joined here by the Jacobs Gutter stream. It then enters Eling creek through tidal flaps and discharges into Southampton Water.

7.7.1.2 Initial Identification of Issues

The South East River Basin Management Plan (2009) waterbody covering this area is

a)	GB107042016960	Bartley Water (Lower)	-	Moderate potential
b)	GB107042016730	Bartley Water (Upper)	-	Good status

The following issues have been identified by the Environment Agency or have been raised by stakeholders:

- Water quality issues probably due to Lyndhurst waste water treatment works and private sewage discharges

7.7.1.3 Potential Local Stakeholder Liaison

Local Councils – Minstead parish/Denny Lodge parish/Ashurst & Colbury parish/Totton & Eling parish
District Council – New Forest District Council
Southern Water
Residents Associations

7.7.1.4 Activities and Action

The following activities and actions have taken place or are planned to improve the water environment in this catchment.

- Not yet addressed

7.7.2 Fletchwood Tributary

7.7.2.1 Description

The Fletchwood Stream is sourced from a number small streams and drains rising in inclosures in the Bartley and Cadnam area and farmland in the Winsor area. One of these streams flows through the village of Bartley but a characteristic of all is that for much of their courses they flow through the relatively little fields of a number of small holdings. The streams come together at Woodlands and join the Bartley Water near Ashurst Bridge in west Totton.

7.7.2.2 Initial Identification of Issues

The South East River Basin Management Plan (2009) waterbody covering this area is

a) GB107042016750 Fletchwood Tributary - Moderate potential

The following issues have been identified by the Environment Agency or have been raised by stakeholders:

- Physical modifications to watercourse
- Potential agricultural run-off

7.7.2.3 Potential Local Stakeholder Liaison

Local Councils – Netley Marsh parish/Copythorne parish
District Council – New Forest District Council
Small holding landowners
Residence Associations

7.7.2.4 Activities and Action

The following activities and actions have taken place or are planned to improve the water environment in this catchment.

- Not yet addressed

7.7.3 Jacobs Gutter

7.7.3.1 Description

Jacobs Gutter rises in mixed woodland near the New Forest Wildlife Park at Langley Wood near Colbury. It then flows through small-scale agricultural fields and skirts the school and residential of Hounsdown before crossing the main A326 Marchwood bypass. It becomes tidal and drains through reed beds into the Bartley Water at the local nature reserve upstream of Eling Tide Mill.

7.7.3.2 Initial Identification of Issues

The South East River Basin Management Plan (2009) waterbody covering this area is

a) GB107042016740 Jacobs Gutter - Good status

The following issues have been identified by the Environment Agency or have been raised by stakeholders:

- No known issues

7.7.3.3 Potential Local Stakeholder Liaison

Local Councils – Totton & Eling parish, Ashurst & Colbury parish, Denny Lodge parish
District Council – New Forest District Council
Residents Associations

7.7.3.4 Activities and Action

The following activities and actions have taken place or are planned to improve the water environment in this catchment.

- Not yet addressed