New Forest Catchment

Water Environment Improvement Plan

APPENDIX A

Technical Communication Documents

Version 1.1

19 December 2012

The following documents are examples of those that have been used to explain the project and communicate with stakeholders, communities and other interested parties. The example documents included at Figures 3 – 6 were used for the Becton Bunny with similar documents being produced for the Sowley Stream/Pond and Hatchet Stream/Pond sub-catchments.

Figure 1 - Pilot Project explanation document

This document was used to explain to stakeholders why a new approach to protecting ponds, rivers, lakes, estuaries and coastal waters in the New Forest is required and how the pilot project will address this.

Why do we need a new approach to protecting ponds, rivers, lakes, estuaries and coastal waters?

In lowland England and Wales, about 95% of freshwaters have damaging levels of pollution; and around 75% of coastal waters fail to meet the minimum standards for good ecological quality. Ponds, which are mostly not protected by water legislation, are generally in poor condition: 80% are in 'poor' or 'very poor' condition.

Protecting our freshwater and marine habitats is a legal requirement, but making the required improvements is proving difficult. Unlike a wood or a meadow, you can't put fence around your local pond or river and keep all damaging influences out. Everything going on in the catchment of the waterbody - where its water comes from, landuse and how it has been modified in the past – will affect its condition.

We already do a lot in our efforts to protect freshwaters and the sea: but our current approach simply isn't achieving enough.

The catchment based approach

Working together to achieve greater gains for the water environment.

- Bringing together local organisations, statutory agencies and communities to share evidence and identify issues.
- Working out priorities for action which are most likely to deliver improvements in water quality at the local level.
- Producing a stakeholder-developed catchment plan – including outline solutions, cost/effectiveness and commitments of implementers where possible.

So the government is trying out a new approach where local organisations work together more closely to produce a plan for water in their area. The aim of this approach is to ensure that priorities are identified at a local level so that activities damaging the freshwater and marine environment are as controlled as possible.

Nationally the new approach is being trialled in 25 catchments – 10 led be the Environment Agency and 15 hosted by external organisations.

In the New Forest catchment, the process is being led by the National Park Authority with support from freshwater wildlife charity Pond Conservation who are working together with local people and organisations to develop a plan for protecting and improving the water environment.

Why has the New Forest been chosen for this new approach?

The New Forest is exceptionally important for freshwater and marine wildlife. Many ponds and rivers are in better condition than is usual for the lowland Britain, because a large percentage of their catchments are comprised of uncultivated habitats which have been managed traditionally for 100s of years.

However, although most rivers and lakes in the New Forest are chemically unpolluted there are other threats – which mean that none of the waterbodies are currently classified as having High ecological status[1], 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.

What is the catchment?

The New Forest catchment covers over 300km^2 and largely corresponds with the New Forest National Park. But it also includes a number of urban areas on the park's periphery and extends into the transitional and coastal waters of The Solent.

Rather than a single river system, the New Forest is drained by a dozen or so unconnected streams and associated lakes. These sub-catchments often have very different issues and threats because of differences in geology and landuse.

As a result, the catchment Pilot project will begin to produce detailed plans for each sub-catchment. Although this is ambitious and will take longer, it should make a real difference with real improvements to our water environment supported by local people.

Where the rivers flow through towns and farmland they are often more seriously degraded – pollution from urbanization and intensive agriculture has some of the worst impacts on freshwaters. These terrestrial sources of pollution then flow out to sea where they impact negatively on our coastal environments.

How should we protect fresh and coastal waters?

Worldwide, scientists are struggling to work out how to protect freshwaters. Freshwaters, estuaries and inshore waters, are exposed to so many threats that controlling them all at the same time is very difficult.

So it makes sense to:

1. Protect the best

2. Build out from the best areas

3. Recreate the scarcest of all resources – clean water, either by controlling pollution or making new waterbodies.

In the New Forest we have the opportunity to protect and restore freshwater and coastal habitats to the very highest standard:

- 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.

[1] On a classification scale of Bad, Poor, Moderate, Good or High used by the Water Framework Directive.

Figure 2 - Practical improvement measures explanation document

This document was used to explain to stakeholders the practical measures that can be used to improve the ponds, streams, rivers and coastal waters of the New Forest.

New Forest Catchment Pilot Project

How can we improve the ponds, streams, rivers, and coastal waters, of the New Forest?

1. Introduction

The New Forest and adjacent coastline has some of England's most natural and unpolluted waters, as good as the finest Scottish salmon rivers or the cleanest mountain tarns. But, many are currently considered to be below par and may even be declining in quality.

There are legal requirements under the Water Framework Directive (WFD) to improve this situation for rivers, streams and lakes. Many smaller ponds, principally those in the more natural parts of the Forest, must also be maintained at a high standard under the provisions of the Habitats Directive[1].

Protecting these precious places, and fixing those with problems, to ensure that we can continue using the water environment without irreparably damaging it, is not easy. The New Forest Catchment Pilot Project has been set up to test some new approaches to protecting this most vulnerable part of the natural environment.

Successful restoration projects will:

- provide clean water habitats
- be based on evidence and assess ecological status using appropriate measures and standards, which may be above the targets set under the WFD
- bring together all the stakeholders in the catchment to agree a plan of action
- be followed by monitoring to understand which measures are effective to inform and streamline future works

Overall, the aim of the New Forest catchment pilot project is to make sure that the waterbodies which are outstanding stay that way and to improve those that are degraded.

We especially need to reduce pollution – as this is crucial to maintaining healthy aquatic environments; we also need to improve the physical structure of streams and rivers which have often been straightened or dammed, usually to make them better drains. And we need to pay attention to small waters – ponds and small streams – which risk being overlooked under the provisions of the WFD.

[1] Other guidance sheets in this series explain the legal protection afforded to the water environment.

For some waters – mainly the rivers, larger lakes and coastal waters, there is very precise technical guidance in the Water Framework Directive on what we should be aiming for: either 'Good' or 'High' ecological status[2] – on a five point scale of Bad, Poor, Moderate, Good and High.

As a minimum we are aiming for 'Good' status but many people involved with the Forest are worried that 'Good' is not really good enough to protect its special wildlife and fish communities.

So in the Pilot project we are aiming for the best possible conditions in fresh and coastal waters – so called High status - the standard already seen in the best managed and least polluted parts of the Forest.

Cleaning up the larger rivers, lakes and coastal waters is sometimes difficult and expensive. Added to this, at present we don't know how to fix all the problems facing the bigger waterbodies - technical solutions on this scale have not been achieved before.

On the other hand some of the small headwater streams, ponds and the smaller drainage ditches can be quickly and cheaply protected or improved. And whereas it would be impossible to create new high quality rivers in the New Forest, it is entirely practical to add new ponds which could help protect the remarkable variety of endangered freshwater plants and animals for which the Forest is a last refuge in Britain.

[2] In some cases the technical term Good ecological potential is the aim instead of Good ecological status.

What is a catchment and why are we working at this scale?

For administrative ease the catchments of the New Forest have been grouped together into a single catchment called the New Forest catchment. But every waterbody in the Forest, and along the coast, has its own catchment – the area of land which water is drained from. These may be tiny catchments of a few 10s of square metres around a pond, to a few hundred hectares for lakes like Hatchet Pond, to several thousand hectares for the Beaulieu River. The estuaries, the groundwaters and The Solent also drain water from their catchments, and these large areas may include several rivers and many hundreds of ponds.

In every waterbody we need to look at the full range of problems affecting it and control enough of them in the catchment to make difference. Although this seems obvious, catchment management work has not always been done this way. Fixing only one problem or part of the problem may not be enough to see any improvement in the environment.

Some problems are best controlled across the whole area – for example the Environment Agency can provide advice to all planners about flood management needs across large parts of the New Forest catchment area. Other problems – improving individual streams or ponds, for example, are concerned with a very much smaller area – perhaps involving one or a handful of land managers.

It is true, that it is often easier to fix small streams and ponds, than bigger areas. Often these smaller catchments are affected by fewer issues or there are fewer stakeholders involved in agreeing measures to reach a solution. But, we can work on the larger catchments if we can reach agreement with all the stakeholders involved – and in these bigger catchments it makes sense to start at the top and clean up downstream.

2. Practical principles

2.1 First, find out what the problem is

Although we have a very clear idea of the general problems affecting fresh and coastal waters – pollution, physical damage, alien species, too much water taken for consumption - for individual ponds, rivers or coastal areas we may not have enough information to fully understand why that waterbody is not in good condition. So the first step in making improvements is to bring together all the information we have available from experts and local stakeholders to provide as complete a picture as possible. Where there are gaps – which there are often likely to be – we may need to collect new information before we can make recommendations what to do to better protect, or improve, a waterbody.

Protecting existing high quality waters in the New Forest is especially important. For example, where the upper sections of streams rise on the Forest it is important we make sure these do not decline in quality whilst we concentrate on improving the clearly degraded lower sections. Some careful planning of practical work and monitoring is needed to avoid this problem.

2.2 Then tackle any water pollution problems

We know that water quality is the most important requirement for healthy fresh and coastal waters - but clean water can be very difficult to restore.

In most catchments there are multiple sources of pollution, including pollution from sewage treatment works, misconnected domestic drains running into stream and rivers and diffuse runoff from urban areas and farmland.

All of these problems need to be addressed simultaneously to achieve the improvements we need in water quality. Once water pollution is under control it then makes sense to undertake other management – for example remeandering rivers which have been straightened and deepened, or managing ponds. In many places if the underlying water quality issues remain, physical management is often of little benefit.

In the New Forest many of the rivers and ponds are located in semi-natural habitats and therefore have a good chance of being fed by clean water which is not affected by pollution. In these clean water catchments, restoring rivers which have been artificially straightened to their natural form will restore degraded freshwater habitats and help prevent issues such as erosion, winter flooding and low summer flows downstream. Similarly physical management of ponds or lakes is more likely to be beneficial than in polluted waters.

What kind of water quality improvements are needed?

- Clean water, free from pollution, is critical for achieving healthy aquatic environments
- Ensure that point source pollution is controlled through new technologies and legislation
- Working with landowners at a catchment scale to reduce diffuse pollution
- Creating new clean water habitats

In waters with largely natural catchments there may be small isolated sources of pollution impacting on a waterbody which would otherwise be fed by clean water. Once identified these can be resolved to achieve quick wins for biodiversity and prevent further

declines in the quality of the habitat for wildlife.

In some catchments it may not be possible to reduce pollution to levels enough to support healthy freshwater communities. Even where we can, the length of time taken for the community to recover is not always known. Nutrients trapped in lake or river sediments will be released long after the pollution source has been removed – estimates suggest that in lakes the initial recovery may not be noticeable for 10-15 years and even longer for other freshwater habitats. But not all changes are slow: new clean water habitats, such as pond complexes, in semi-natural habitats can provide instant reservoirs of clean water.

2.3 What sort of restoration measures should we implement?

Measures to control pollution from single big sources like sewage works or factories using a lot of water are well understood – although in some places they still need to be implemented. Improvements are mainly made by removing, as much as possible any polluting chemicals form the discharged water.

Measures to control the pollution from large numbers of small pollution sources dotted across catchments - like the fertilizer running from field or the dirty water from roads - are much less proven. There are many techniques promoted – like buffer strips and Sustainable Drainage System (SuDS) - but their effects on a large scale in improving waters is not yet clear.

In many places it will be necessary to combine big pipe schemes with the control of smaller sources. It is not easy to take a set of measures off the shelf and be certain they will bring about the improvements we need - there are too few examples of such schemes and much of the work in this area is pushing the limits of our understanding.

Equally uncertain are schemes to manage the amount of water in a waterbody, especially flowing waters. When very large amounts of waters – 80-90% of water are removed, and waters that would normally be permanent start to dry up - the effects are clear. But the subtler effects of smaller removals are much less understood.

What kind of physical habitat improvements are needed?

- Managing rivers and streams to restore natural structure
- Management of ponds
- Creation of new ponds and wetlands
- There is also a substantial programme to protect the New Forest mires and bogs but this is not considered further in these sheets.

Some measures do clearly work: removing a dam will open up new habitat to migratory fish. Creating clean water ponds or wetlands in areas with catchments that are unpolluted provides habitat for endangered species. Remeandering rivers which have clean water will increase the area of good quality river habitat. Stopping the use of a pesticide will mean it no longer runs off the land.

Not all measures will be appropriate to every catchment (Table 1) and the production of a project plan needs to be carried out in consultation with local stakeholders to determine which measures are the most cost effective. The New Forest pilot has an important role in finding out what is effective as the project team has very considerable expertise in developing new techniques for controlling pollutants and improving habitats. This means that lessons learnt in the Forest will be very widely applicable.

Table 1 Checklist of practical measures used in catchment management to improve water environment

Water quality improvement

Point source control

- Upgrading sewage treatment works
- Improving other point source discharges through consents process
- Ensure that rural septic tanks are working effectively

Diffuse pollution control (measures with a prefix F also reduce flow rates)

Farmland landscape measures including:

- Nutrient management to reduce total inputs and losses: implement Nutrient Management Plan
- Slurry management and reduction of dirty water production (see Defra information sources)
- Site manure heaps away from water bodies; store manure on solid bases and collect effluent
- [F]Consider adapting tillage practices: e.g. convert from ploughing to minimum tillage
- [F]Tramlines: avoid up and downslope tramlines (note effectiveness uncertain)
- [F]Buffer strips, and infield grass buffers
- [F]Install field drain interceptors to slow and intercept flow from field drains
- [F]Install interception ponds and wetlands to remove sediments and nutrients from ditch flow
- [F]Ditch bunding to reduce runoff rates (still experimental)
- Fencing streams (note: widely applied but may have disadvantages)
- Deintensify land e.g. arable to grass conversion; intensive grass to low or zero input
- Establish autumn cover crops, cultivate in spring rather than autumn, cultivate compacted soils
- Construct bridges for livestock crossing streams in intensive systems (not applicable to Open Forest)
- Resite gateways that have high erosion risk
- Manage road and farm track runoff

Urban landscape measures

- SUDS in urban areas
- Correcting misconnections
- Improving septic tank systems

Flow management

Measures listed above with a superscript F under diffuse pollution control also influence flows

- Install flood storage ponds
- In-field temporary storage bunds
- Creation of washlands
- Install or recreate debris dams in channels

Physical habitat creation and management

- River and stream channel restoration
- Clean water pond creation and wetland creation
- Pond and lake physical management (e.g. desilting, fish management, tree management)

Non native species

- Control and eradication programmes

3. The practical measures

3.1 Control town, village and road pollution sources

Improvements in technology and tightening of limits on what chemicals can be discharged in waste water have reduced levels of pollution from many industrial and sewage discharges (e.g. a phosphate decline of around 30% since 2000). Although this process has been reasonably successful, we now know that the levels of many potentially polluting chemicals have to be very low to make a difference to the ecosystem.

So there are still big pipe sources that have to be controlled – for example at some sewage works in the New Forest – if rivers in particular are to reach the high standards possible in this landscape. An added complication is that even quite big reductions in pollutants such as phosphorus from sewage works will not be enough to benefit inland waters unless the other sources – from urban and rural land – are also controlled.

In rural areas the number of unregulated discharges from septic tanks with inadequate soakaway facilities or direct discharges into ditches and rivers is unknown, but this may be significant. Householders have a responsibility to ensure that systems are fit for purpose and regularly emptied and can register with the Environment Agency for a non polluting domestic discharge.

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. In the New Forest because of the importance of many of the smaller streams and ponds, the existence and control of these sources should be investigated.

In urban districts foul domestic wastewater (the pipe from the bath, toilet, washing machine and wash basin in a house) is sometimes accidentally discharged straight to environment through surface water drains rather than going first to a sewage works, before being returned to a river or stream. 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.

Householders can carry out a simple inspection to determine whether they have a misconnection (www.connectright.org.uk), or the presence of a misconnection may be identified through a catchment survey of phosphate levels. As part of a public awareness campaign households can also be encouraged to reduce their demands on water and limit their use of detergents.

Controlling the pollution from roads, pavements and guttering that runs through drains untreated into ditches, streams, rivers and ponds is a major problem in urban and some rural areas. Where this dirty water is piped, sediments and pollutants run directly into waterbodies.

Big efforts are being made to try to control this kind of pollution by stopping the pollution at source, and slowing the flow of water so it doesn't reach important waterbodies. This whole process is known as Sustainable Drainage Systems (SuDS) – a new environmental technology which people are trying out.

SuDs can bring benefits in some places, for example in new developments – but probably will not work everywhere. In existing urban areas there is simply not enough room amongst the buildings to install the treatment systems – a process known as 'retro-fitting',

Grassy swales can be used to intercept runoff from roads but they become part of the problem if the vegetation is removed and bare soils exposed to erosion

Where there is more room in less densely populated urban areas, gently sloping shallow ditches, which are vegetated and which include interception ponds may help to protect water quality without compromising drainage. But, maintenance of ditches which removes the vegetation and exposes bare soil can exacerbate issues of water quality by increasing erosion.

In the New Forest it is particularly important that road drainage is not diverted into ponds adjacent to the roadside if they are currently unconnected. These small waterbodies are particularly vulnerable to pollution and currently support a suite of species which have very high conservation value.

3.2 Control farmland sources of pollution

Practical measures which have the potential to reduce diffuse pollution from agriculture can be broadly categorized into three groups; reducing inputs, limiting runoff and preventing pollutants from entering waterbodies.

In the New Forest there are a large number of small farms - around 85% are less than 20ha in size and around 600 farms are less than 5ha. Maintaining these smallholdings, which are often a vital part of the commoning system of the New Forest landscape, requires recognition of the difficult economic conditions many of these farms operate under. Therefore the benefits of any measures will need to weighed against their effectiveness – the objective to remember is that the pollution generated by a landscape needs to be a near as possible to the very small amounts coming naturally from the forest, the heaths and the mires.

Reducing inputs

Good nutrient management – e.g. reducing inputs, timing of applications, low nutrient feeds, stocking densities and incorporation of manures and fertilisers into the soil – will reduce nutrient surpluses and result in less impact on the water environment as well as cost savings. Nationally, over 50% of farms already have a Nutrient Management Plan and others should be supported to produce their own.

Limiting runoff

Once fertilisers and other agricultural chemical have been applied, measures can be used to prevent mobilization of nutrients from the soil. Many of these measures relate to the prevention of soil erosion – e.g. stabilization of ploughed soils through planting, restriction of livestock at certain times of year and from areas vulnerable to erosion, moving gateways away from drainage areas, tramline management and avoidance of trackway compaction. Care is also needed to prevent runoff from manure heaps and farmyards into watercourses. Stable yards, even for one or two horses, may be a large source of phosphorus pollution in a small stream.

Intercepting runoff

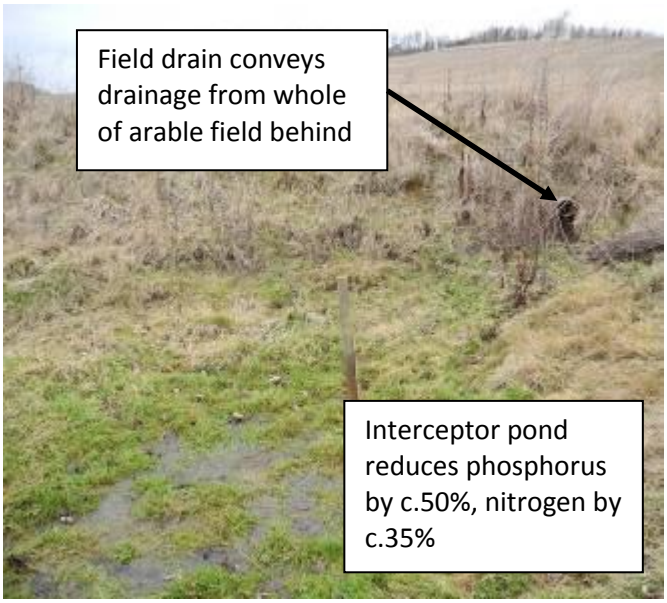
Small scale interventions across the catchment can intercept diffuse pollutants at the point where they leave the field, before they reach the watercourse. These may include buffer strips (although evidence on the effectiveness of this measure is contradictory), intercepting field drains, creation of pond and wetland interceptors (these can remove 50% of phosphorus, 50% of sediment and 30% of nitrogen) and installing low bunds in ditches to trap sediments. Note that these trapping systems are still experimental.

The effectiveness of these combined measures is the subject of major research studies at present. Up to now, the most effective techniques generally have involved stopping pollutants getting into the environment in the first place, rather than trying to control their movement once they are in the water running into ponds, rivers or the sea.

3.3 Returning clean water to the landscape

Cleaning up is difficult and slow, and sometimes impossible. An effective alternative way of increasing the availability of high quality clean water is to create new habitats. Theoretically any kind of new freshwater can be created – in practice it is easiest for ponds, wetlands, ditches and small lakes. Clean water cannot be created in this way in the marine environment, although coastal clean water brackish lagoons can be made using this approach.

Creating clean water ponds is a now well-recognised technique for quickly and cheaply putting clean water back into the landscape.



Field drains can convey large quantities of nutrients and sediments directly to the watercourse, often bypassing buffer strips. Interceptor ponds allow sediments and nutrients to settle out before the water reaches the watercourse.

3.4 Slowing the flow

In many places it is also desirable to slow the flow of water from the land to waterbody, and to slow down the flow in watercourse. This can stop pollutants and sediment from reaching ponds, rivers and the sea. It also can help to stop downstream flooding.

Many of the techniques mentioned in the pollution control section also have the potential to function as temporary water stores that can reduce the rate of water flow.

Specifically the following techniques are now being widely used or trialed to slow down the movement of water across catchments:

- SUDS systems
- intercepting field drains
- creation of pond and wetland interceptors
- installing low bunds in ditches to trap sediments

4. Further useful information

A coordinated approach

There are several plans and working groups tackling specific issues related to the freshwater and coastal environments of the New Forest – e.g. Catchment Abstraction Management Plans, the North Solent Shoreline Management Plan, etc. There are also projects already being implemented on the ground in collaboration with land owners, land managers and local communities.

The New Forest catchment pilot will take an overview of these initiatives, identify where there are gaps and work with stakeholders to take a coordinated approach to protection and restoration within each catchment.

More information about the New Forest Catchment Pilot Project:
www.newforestnpa.gov.uk/looking-after/wildlife/catchment-project
www.pondconservation.org.uk/pond_hap/New+Forest+Catchment+Pilot

Key facts about the New Forest:
www.naturalengland.org.uk/Images/131_New_Forest_tcm6-32143.pdf
www.newforestnpa.gov.uk/

New Forest Land Advice Service: www.nflandadvice.org.uk

Nutrient management information: www.defra.gov.uk/food-farm/land-manage/nutrients/

Sustainable Drainage Systems: www.ciria.com/suds/

Identifying misconnections: www.connectright.org.uk/

Restoring the hydrology of New Forest rivers:
www.environment-agency.gov.uk/homeandleisure/wildlife/113720.aspx

Creating clean water ponds - Million Ponds Project toolkit:
www.pondconservation.org.uk/millionponds/pondcreationtoolkit

Non-native invasive plants in the New Forest:
www.hwt.org.uk/pages/new-forest-non-native-plants-project.html

North Solent Shoreline Management Plan:
www.northsolentsmp.co.uk/index.cfm?articleid=6554&articleaction=nthslnt&CFID=10929116&CFTOKEN=75614263

New Forest Catchment Flood Management Plan
http://publications.environment-agency.gov.uk/PDF/GESO1008BOWA-E-E.pdf

New Forest Catchment Abstraction Management Strategy
http://publications.environment-agency.gov.uk/PDF/GESO0307BMBO-E-E.pdf

Figure 3 - Becton Bunny initial catchment walkover map

This document was used to explain to stakeholders the issues identified during the initial catchment walkover and thought to be impacting a sub-catchment – in this case the Becton Bunny.

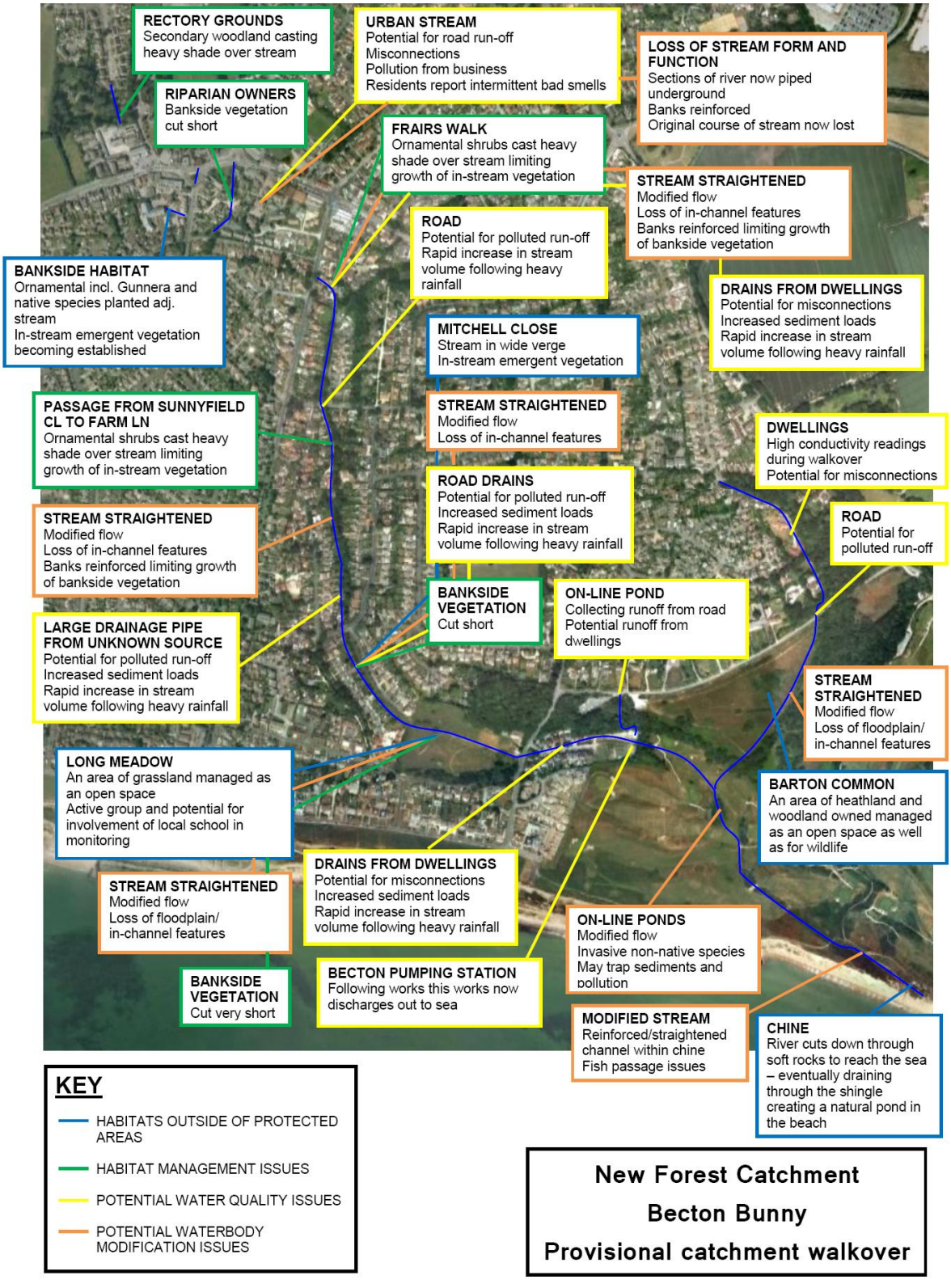

RECTORY GROUNDS
Secondary woodland casting heavy shade over stream
RIPARIAN OWNERS
Bankside vegetation cut short
URBAN STREAM
Potential for road run-off
Misconnections
Pollution from business
Residents report intermittent bad smells
LOSS OF STREAM FORM AND FUNCTION
Sections of river now piped underground
Banks reinforced
Original course of stream now lost
FRAIRS WALK
Ornamental shrubs cast heavy shade over stream limiting growth of in-stream vegetation
STREAM STRAIGHTENED
Modified flow
Loss of in-channel features
Banks reinforced limiting growth of bankside vegetation
ROAD
Potential for polluted run-off
Rapid increase in stream volume following heavy rainfall
BANKSIDE HABITAT
Ornamental incl. Gunnera and native species planted adj. stream
In-stream emergent vegetation becoming established
DRAINS FROM DWELLINGS
Potential for misconnections
Increased sediment loads
Rapid increase in stream volume following heavy rainfall
MITCHELL CLOSE
Stream in wide verge
In-stream emergent vegetation
PASSAGE FROM SUNNYFIELD CL TO FARM LN
Ornamental shrubs cast heavy shade over stream limiting growth of in-stream vegetation
STREAM STRAIGHTENED
Modified flow
Loss of in-channel features
DWELLINGS
High conductivity readings during walkover
Potential for misconnections
ROAD DRAINS
Potential for polluted run-off
Increased sediment loads
Rapid increase in stream volume following heavy rainfall
ROAD
Potential for polluted run-off
STREAM STRAIGHTENED
Modified flow
Loss of in-channel features
Banks reinforced limiting growth of bankside vegetation
BANKSIDE VEGETATION
Cut short
ON-LINE POND
Collecting runoff from road
Potential runoff from dwellings
LARGE DRAINAGE PIPE FROM UNKNOWN SOURCE
Potential for polluted run-off
Increased sediment loads
Rapid increase in stream volume following heavy rainfall
STREAM STRAIGHTENED
Modified flow
Loss of floodplain/ in-channel features
LONG MEADOW
An area of grassland managed as an open space
Active group and potential for involvement of local school in monitoring
BARTON COMMON
An area of heathland and woodland owned managed as an open space as well as for wildlife
DRAINS FROM DWELLINGS
Potential for misconnections
Increased sediment loads
Rapid increase in stream volume following heavy rainfall
STREAM STRAIGHTENED
Modified flow
Loss of floodplain/ in-channel features
ON-LINE PONDS
Modified flow
Invasive non-native species
May trap sediments and pollution
BANKSIDE VEGETATION
Cut very short
BECTON PUMPING STATION
Following works this works now discharges out to sea
MODIFIED STREAM
Reinforced/straightened channel within chine
Fish passage issues
CHINE
River cuts down through soft rocks to reach the sea – eventually draining through the shingle creating a natural pond in the beach
KEY
HABITATS OUTSIDE OF PROTECTED AREAS
HABITAT MANAGEMENT ISSUES
POTENTIAL WATER QUALITY ISSUES
POTENTIAL WATERBODY MODIFICATION ISSUES
New Forest Catchment
Becton Bunny
Provisional catchment walkover

Figure 4 - Becton Bunny walkover water sampling map

This document was used to demonstrate to stakeholders where water samples had been taken during the detailed catchment walkover of a sub-catchment – in this case the Becton Bunny. It was used in conjunction with the charts at Figures 5 and 6.

New Forest Catchment
Becton Bunny
Detailed catchment walkover
Water samples - 21/09/2012

Figure 5 - Becton Bunny phosphate sampling point data chart

This chart was used in conjunction with the map at Figure 4 to explain to stakeholders the phosphate levels for the sampling points shown in a sub-catchment – in this case the Becton Bunny.

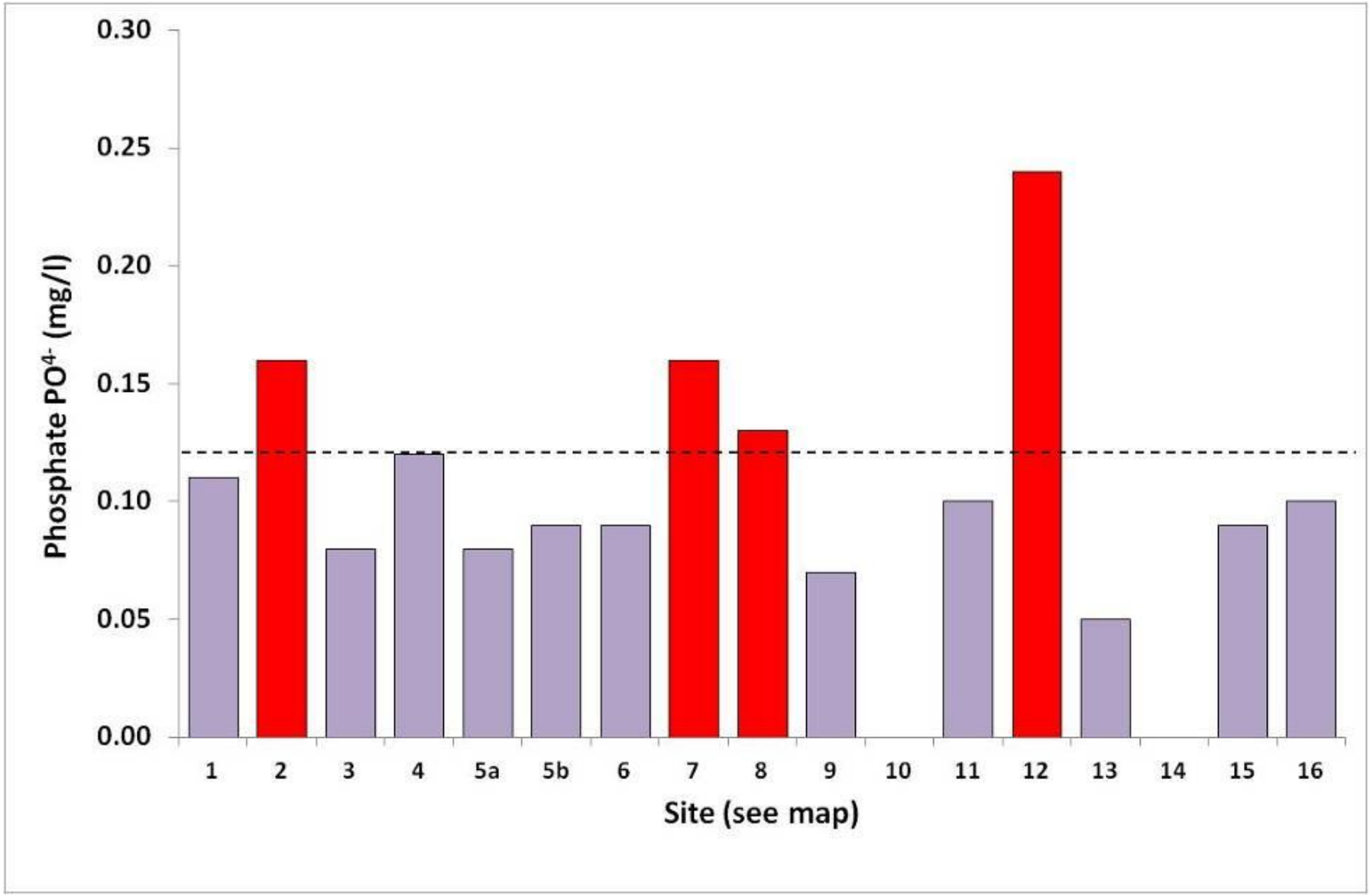
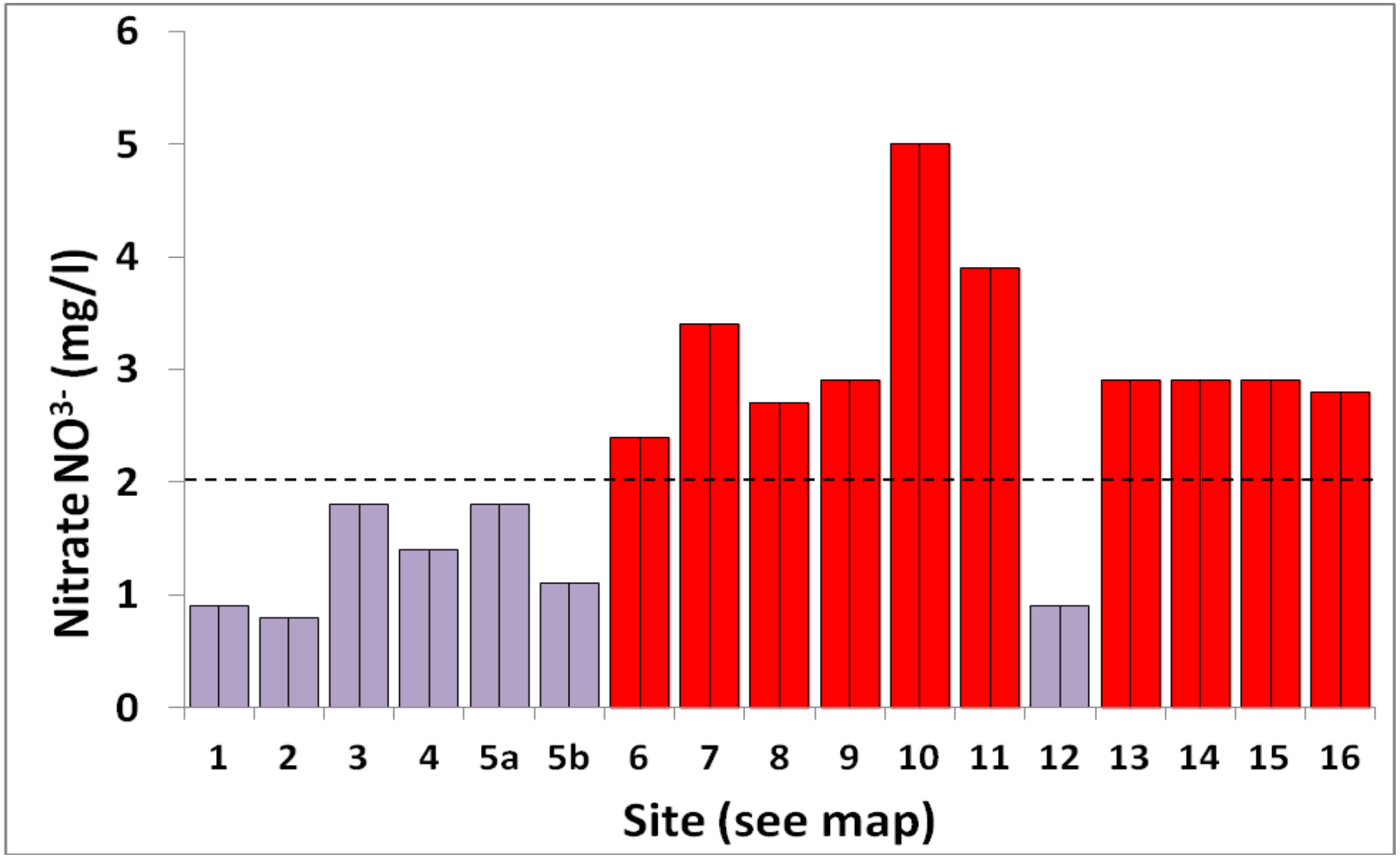

0.30
0.25
0.20
0.15
0.10
0.05
0.00
Phosphate PO4- (mg/l)
1
2
3
4
5a
5b
6
7
8
9
10
11
12
13
14
15
16
Site (see map)

Figure 6 - Becton Bunny nitrate sampling point data chart

This chart was used in conjunction with the map at Figure 4 to explain to stakeholders the nitrate levels for the sampling points shown in a sub-catchment – in this case the Becton Bunny.


Nitrate NO3- (mg/l)
0
1
2
3
4
5
6
1
2
3
4
5a
5b
6
7
8
9
10
11
12
13
14
15
16
Site (see map)